NES, Inc.

H. B. ROBINSON
UNIT 2

INTERVAL 3, PERIOD 1, OUTAGE 2
(REFUEL OUTAGE 15)

INSERVICE INSPECTION

FINAL REPORT

Prepared for
Carolina Power and Light Company

Prepared for

Carolina Power and Light Compan

TABLE OF CONTENTS

FORM NIS-1 OWNER'S REPORT FOR INSERVICE INSPECTIONS

As required by the Provisions of the ASME Code Rules

1. Owner CAROLINA POWER & LIGHT COMPANY, 411 FAYETTEVILLE ST., RALEIGH, NC 27602
(Name and Address of Owner)

2. Plant H.B.ROBINSON, HWY.151 & SC 23 HARTSVILLE, SC 29550
(Name and Address of Plant)

3. Plant Unit HBR2 4. Owner Certificate of Authorization (if required) N/A

5. Commercial Service Date 3/7/71 6. National Board Number for Unit N/A

7. Components Inspected

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
REACTOR VESSEL	WESTINGHOUSE	CPLRCPCRV1	N/A	NB-20772
PRESSURIZER	WESTINGHOUSE	CPLRCPCPR1	N/A	722
STEAM GENERATOR A	WESTINGHOUSE	93732	N/A	N/A
STEAM GENERATOR B	WESTINGHOUSE	93733	N/A	N/A
PIPING	EBASCO SVCS. INC.	N/A	N/A	N/A
R.C.PUMP A	WESTINGHOUSE	CPLRCPCPC1	N/A	N/A
VALVES	EBASCO SVCS. INC.	N/A	N/A	N/A
EX.LETDOWN H.X.	WESTINGHOUSE	949	N/A	700
SUPPORTS	EBASCO SVCS. INC.	N/A	N/A	N/A

Note: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8½ in x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-1 (Back)

8. Examination Dates 07/01/92 to 02/07/94 9. Inspection Interval from 02/19/92 to 02/19/02

10. Applicable Editions of Section XI 1986 Addenda N/A

11. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval. SEE TABS B AND C BOOK 1 OF 3

12. Abstract of Conditions Noted. SEE TAB B BOOK 1 OF 3

13. Abstract of Corrective Measures Recommended and Taken. SEE TABS D AND F BOOKS 1 AND 2 OF 3

We certify that the statements made in this report are correct and the examinations and corrective measures taken conform to the rules of the ASME Code, Section XI.

Certificate of Authorization No. (if applicable) N/A Expiration Date N/A

Date Feb. 7, 19 94 Signed CP&L (Owner) By 2/7/94

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by The Hartford Steam Boiler Insp. and Ins. Co. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 7-1 92 to 2-7-94, and state to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in the Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C. Vallecorsa Commissions TN 971
Inspector's Signature National Board, State, Province, and Endorsement

Date 2-7 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 2/2/94

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1017 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 1 (Address) Expiration Date N/A

4. Identification of System COMPONENT COOLING

5. (a) Applicable Construction Code B31.1 19 86 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
PIPING	EBASCO	N/A	N/A	N/A	1971	REPLACED	NO
PIPING	NED	N/A	N/A	N/A	1993	REPLACEMENT	NO

7. Description of Work REPLOCATION OF LINES: 1-AC-121, 1-AC-122 AND 3-AC-137.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure 232 psi Test Temp. AMBIENT°F

200 AMBIENT

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE MOD-1017 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement
conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 2/2, 19 94
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 7-26-91 to 2-7-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C. Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 2-7-94, 19 ____

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/30/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1086 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 1. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code SEC.III 19 86 Edition, 1988 Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
PIPING	EBASCO	N/A	N/A	N/A	1971	REPLACED	NO
VALVES	EBASCO	N/A	N/A	N/A	1971	REPLACED	NO
PIPING	NED	N/A	N/A	N/A	1993	REPLACEMENT	NO
VALVES	AGCO	SEE BELOW	N/A	SEE BELOW	1993	REPLACEMENT	NO

7. Description of Work RESIZED 2"SAFETY VALVES 858A,B&C WITH 1" VALVES AND BLIND FLANGED OLD CONNEECTIONS

8. Tests Conducted: Hydrostatic [ ] Pneumatic [X] Nominal Operating Pressure [ ]

Other [ ] Pressure 660 psi Test Temp. AMBIENT °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-2 (Back)

9. Remarks SEE MOD-1086 TURNOVER PACKAGE, ALSO SEE ADDITIONAL INFORMATION BELOW

Applicable Manufacturer's Data Reports to be attached

SI-858A ANDERSON GREENWOOD COMPANY S/N N92914 AGCO SALES ORDER 11.0604. P/N N06.1047.012

SI-858B ANDERSON GREENWOOD COMPANY S/N N92914 AGCO MODEL NO.83FS808C08 ALG-N2

SI-858C & SPARE SI-858 S/N'S N92915 & N92916 SAME AS IN SI-858A&B ABOVE.

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/31, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 6-30.93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/23/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1097 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 1. (Address) Expiration Date N/A

4. Identification of System PENETRATION PRESSURIZATION SYSTEM

5. (a) Applicable Construction Code B31.1 19 86 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86.

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
PP-250C	EBASCO	N/A	N/A	N/A	1971	REPLACED	NO
PP-250C	CONVAL	N/A	N/A	733-001-13	1993	REPLACEMENT	NO
EV-1721A	ASCO	NP8316 E37E	N/A	N/A	1971	REPLACED	NO
EV-1728A	VALCOR	V573-5235-2	N/A	737-762-70	1993	REPLACEMENT	NO

7. Description of Work REPLACED PPS VALVES TO IMPROVE PERFORMANCE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [X] Nominal Operating Pressure [ ]

Other [ ] Pressure 180 psi Test Temp. AMBIENT °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE MOD-1097 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/23, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 6-21-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18-94, 19 ____

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/30/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1107 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 1. (Address) Expiration Date N/A

4. Identification of System AUXILIARY FEEDWATER

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
PIPING	EBASCO	N/A	N/A	N/A	1970	REPLACED	NO
PIPING	NED	N/A	N/A	N/A	1993	REPLACEMENT	NO
VALVES	EBASCO	N/A	N/A	N/A	1970	REPLACED	NO
VALVES	NED	N/A	N/A	N/A	1993	REPLACEMENT	NO

7. Description of Work REPLACED EXISTING PIPING AND VALVES WITH NEW PIPING AND VALVES (RECIRC LINES).

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure 2340 psi Test Temp. AMBIENT°F

1925 psi Test Temp. AMBIENT

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE MOD-1107 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard D. Weber SR.SPECIALIST Date 12/30, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 7-15-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/23/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1113 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 1. (Address) Expiration Date N/A

4. Identification of System SERVICE WATER

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
PIPING	EBASCO	N/A	N/A	22-25&38-41	1984	REPLACED	NO
PIPING	NED	N/A	N/A	22-25&38-41	1993	REPLACEMENT	NO
BELLOWS	EBASCO	N/A	N/A	SLEEVE S-5	1971	REPLACED	NO
BELLOWS	NED	N/A	N/A	SLEEVE S-5	1993	REPLACEMENT	NO

7. Description of Work ADDED LINER PIPE TO SW PIPE AT PEN'S 49 THRU 56 AND REPLACED BELLOWS AT S-5 .

8. Tests Conducted: Hydrostatic [X] Pneumatic [X] Nominal Operating Pressure [ ]

Other [ ] Pressure 190 psi Test Temp. AMBIENT°F HYDRO

Pressure 75 psi Test Temp. AMBIENT F PNEUMATIC

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE MOD-1113 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/23, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 6-21-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon R. Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/23/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 2

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1134 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 1. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
3/4"PIPE	EBASCO	N/A	N/A	SI-1501R-100	1971	REPLACED	NO
STRAINER	NED	S-100A	N/A	S-100A	1992	REPLACEMENT	NO
3/4"PIPE	EBASCO	N/A	N/A	SI-1501R-101	1971	REPLACED	NO
STRAINER	NED	S-100B	N/A	S-100B	1992	REPLACEMENT	NO

7. Description of Work REPLACED 3/4" PIPING IN SI PUMP "A" AND "B" RECIRC. LINES WITH STRAINERS.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure 2625 psi Test Temp. 74 °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE MOD-1134 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/23, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-1-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 2-7, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/31/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 2 of 2

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) MOD-1134 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by NED (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM1. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
3/4"PIPE	EBASCO	N/A	N/A	SI-1501R-102	1971	REPLACED	NO
STRAINER	NED	S-100C	N/A	S-100C	1993	REPLACEMENT	NO

7. Description of Work REPLACED 3/4" PIPING IN SI PUMP "C" RECIRC. LINE WITH STRAINER.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure 2625 psi Test Temp. >50 °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE MOD-1134 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/31, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-1-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C. Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 2-7, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/14/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-ANYE1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	LCV-460A	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	LCV-460A	1992	REPLACEMENT	NO

7. Description of Work REPLACED BONNET STUDS AND NUTS DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [ ] Pressure >2235 psi Test Temp. >500 °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-2 (Back)

9. Remarks SEE WR/JO 92-ANYE1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
rpair or replacement

conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/14, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-18-92 to 1-18-94 and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/16/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-ALJQ2 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System DIESEL FUEL OIL

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
F.O. XFR.	EBASCO	N/A	N/A	DIESEL FUEL	1971	REPLACED	NO
PUMP B							
F.O. XFR.	MAINTENANCE	N/A	N/A	DIESEL FUEL	1992	REPLACEMENT	NO
PUMP B							

7. Description of Work REPLACED FUEL OIL TRANSFER PUMP B DUE TO LOW FLOW AND HIGH VIBRATION.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [ ] Pressure 15 psi Test Temp. AMBIENT °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-2 (Back)

9. Remarks SEE WR/JO 92-ALJQ2 TURNOVER PACKAGE.
Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/16, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 7-30-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon O Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY Date 12/16/93
Name

411 FAYETTEVILLE ST., RALEIGH, NC 27602 Sheet 1 of 1
Address

2. Plant H.B.ROBINSON Unit HBR2
Name

HWY.151 & SC 23 HARTSVILLE, SC 29550 WR/JO 92-ANZF1
Address Repair Organization PO NO., Job No., etc.

3. Work Performed by MAINTENANCE Type Code Symbol Stamp N/A
Name

Authorization No. N/A

SAME AS ITEM 2 Expiration Date N/A
Address

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	LCV-460B	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	LCV-460B	1992	REPLACEMENT	NO

7. Description of Work REPLACED BONNET STUDS DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [X] Pressure 2235 psi Test Temp. >500 °F

VT-1 ,STROKE TESTED, AND EXTERNAL LEAKAGE TESTED

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-ANZF1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/16, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-18-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY Date 12/16/93
Name

411 FAYETTEVILLE ST., RALEIGH, NC 27602 Sheet 1 of 1
Address

2. Plant H.B.ROBINSON Unit HBR2
Name

HWY.151 & SC 23 HARTSVILLE, SC 29550 WR/JO 93-ADJC1
Address Repair Organization PO NO., Job No., etc.

3. Work Performed by MAINTENANCE Type Code Symbol Stamp N/A
Name

Authorization No. N/A

SAME AS ITEM 2 Expiration Date N/A
Address

4. Identification of System DIESEL FUEL OIL

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
F.O.XFR.	EBASCO	N/A	N/A	DIESEL	1971	REPLACED	NO
PUMP A							
F.O.XFR.	MAINTENANCE	N/A	N/A	DIESEL	1993	REPLACEMENT	NO
PUMP A							

7. Description of Work REPLACED PUMP A DUE TO FAILURE TREND

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [ ] Pressure 15 psi Test Temp. AMBIENT °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-ADJC1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement
conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/16, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 3-6-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/16/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AHYF2 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System SERVICE WATER

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
SW PUMP A	EBASCO	N/A	N/A	N/A	1971	REPLACED	NO
SW PUMP A	MAINTENANCE	N/A	N/A	N/A	1993	REPLACEMENT	NO

7. Description of Work REPLACED SERVICE WATER PUMP A DUE TO LOW FLOW

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [ ] Pressure 50 psi Test Temp. AMBIENT °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AHYF2 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard D. Weber SR.SPECIALIST Date 12/16, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 8-5-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/16/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-APPI1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System FEEDWATER

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
SNUBBER #29	EBASCO	N/A	N/A	N/A	1971	REPLACED	NO
SNUBBER #29	MAINTENANCE	N/A	N/A	N/A	1992	REPLACEMENT	NO

7. Description of Work REPLACED OLD PIN AND RETAINING RINGS.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure psi Test Temp. °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-APPI1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/16, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-29-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon R Valladares Commissions TN571

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/16/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-AEUF1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System RHR

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	RHR-760	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	RHR-760	1992	REPLACEMENT	NO

7. Description of Work REPLACED BONNET STUDS DUE TO LEAKAGE

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-AEUF1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard D. Weber SR.SPECIALIST Date 12/16, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 4-13-92 to 1-18-94 and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon R. Valladares Commissions TN911

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/17/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AJAM1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System RHR

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	RHR-757C	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	RHR-757C	1993	REPLACEMENT	NO

7. Description of Work REPLACED BONNET STUDS DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AJAM1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/17, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-4-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P. Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18-, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/17/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKEC1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	CVC-298B	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	CVC-298B	1993	REPLACEMENT	NO

7. Description of Work REPLACED CVC-298B DUE TO BACK LEAKAGE.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure >2280 psi Test Temp. >500 °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKEC1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/17, 1993

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-6-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/17/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93 AHWL1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	SI-873B	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	SI-873B	1993	REPLACEMENT	NO

7. Description of Work REPLACED SI-873B VALVE DUE TO LEAK TIGHTNESS CONCERNS.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X] (EST-090)

Other [ ] Pressure >1400 psi Test Temp. OPERATING °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AHWL1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/17, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 8-3-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon O Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/18/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AHWK1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	SI-873E	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	SI-873E	1993	REPLACEMENT	NO

7. Description of Work REPLACED VALVE SI-873E DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure >2280 psi Test Temp. >500 °F

SP-1267

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AHWK1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement

conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B Weber SR.SPECIALIST Date 12/18, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 8-3-93 to 1-18-94 RJW 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/18/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AJXK1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-123-BB	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-123-BB	1993	REPLACEMENT	NO

7. Description of Work REPLACED MISSING NUT ON HANGER CPL-123-BB.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure psi Test Temp. °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AJXK1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement

conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/18, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-1-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/18/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AJXM1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System RCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-110-D	1971	REPAIRED	NO

7. Description of Work TIGHTENED NUT ON HANGER TO OBTAIN FULL THREAD ENGAGEMENT.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure psi Test Temp. °F
VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AJXM1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this repair (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/18, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-1-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/18/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AJLR1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	CVC-310B	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	CVC-310B	1993	REPLACEMENT	NO

7. Description of Work REPLACED STUDS, TRIM AND GASKET DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [ ] Pressure >2235 psi Test Temp. >500 °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AJLR1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/18, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9.22.93 to 1.18.94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY Date 12/18/93
Name

411 FAYETTEVILLE ST., RALEIGH, NC 27602 Sheet 1 of 1
Address

2. Plant H.B.ROBINSON Unit HBR2
Name

HWY.151 & SC 23 HARTSVILLE, SC 29550 WR/JO 93-AKNT1
Address Repair Organization PO NO., Job No., etc.

3. Work Performed by MAINTENANCE Type Code Symbol Stamp N/A
Name

Authorization No. N/A

SAME AS ITEM 2. Expiration Date N/A
Address

4. Identification of System MAIN STEAM

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-213-A	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-213-A	1993	REPLACEMENT	NO

7. Description of Work INSTALLED WASHERS UNDER ALL NUTS AND TIGHTENED AS REQUIRED BY DISPOSITION.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [x] Pressure N/A psi Test Temp. N/A °F
vt-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKNT1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/18, 1993

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-15-93 to 1-18-94 and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY Date 12/18/93
Name

411 FAYETTEVILLE ST., RALEIGH, NC 27602 Sheet 1 of 1
Address

2. Plant H.B.ROBINSON Unit HBR2
Name

HWY.151 & SC 23 HARTSVILLE, SC 29550 WR/JO 93-AKNP1
Address Repair Organization PO NO., Job No., etc.

3. Work Performed by MAINTENANCE Type Code Symbol Stamp N/A
Name

Authorization No. N/A

SAME AS ITEM 2. Expiration Date N/A
Address

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-125-A	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-125-A	1993	REPLACEMENT	NO

7. Description of Work INSTALLED WASHERS AS REQUIRED TO TIGHTEN NUTS PER DISPOSITION.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F
VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKNP1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/18, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-15-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKTC1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	SI-882A	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	SI-882A	1993	REPLACEMENT	NO

7. Description of Work REPLACED STUDS AND GASKET DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [X] Pressure <600 psi Test Temp. <250 °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-2 (Back)

9. Remarks SEE WR/JO 93-AKTC1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-20-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN911

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AJJW1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	SI-887	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	SI-887	1993	REPLACEMENT	NO

7. Description of Work REPLACED STUDS AND GASKET DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure psi Test Temp. °F

STROKE TESTED

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AJJW1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-22-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20 93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AJXJ1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System RCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
NOZZLE	WESTINGHOUSE	N/A	N/A	CPL-125-1BC	1971	REPAIRED	NO

7. Description of Work FILED OUT PT INDICATION DETECTED DURING ISI (ARC STRIKE)

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

LIQUID PENETRANT

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AJXJ1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this repair (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-1-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AIZN1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
STUDS	EBASCO	N/A	N/A	FT-155A	1971	REPLACED	NO
STUDS	MAINTENANCE	N/A	N/A	FT-155A	1993	REPLACEMENT	NO

7. Description of Work REPLACED STUDS AND GASKET DUE TO LEAKAGE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [X]

Other [ ] Pressure >2235 psi Test Temp. >500 °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AIZN1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-13-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKNQ1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-143-N	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-143-N	1993	REPLACEMENT	NO

7. Description of Work REPLACED MISSING NUT, ADDED JAM NUTS AND STAKED RODS SO NUTS WON'T BACK OFF.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F
VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9.Remarks SEE WR/JO 93-AKNQ1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 1-15-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon R. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-ASBI3 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System MAIN STEAM

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	MS-353A	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	MS-353A	1993	REPLACEMENT	NO

7. Description of Work REPLACED BONNET CAP SCREWS BROKEN DURING DISASSEMBLY FOR MAINTENANCE

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [x] Pressure N/A psi Test Temp. N/A °F

FULL STROKE EXERCISE TEST

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-ASBI3 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard D Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 3-9-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-AGTS1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System MAIN STEAM

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	MS-154	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	MS-154	1993	REPLACEMENT	NO

7. Description of Work REPLACED MS-154 VALVE, WOULD NOT HOLD PRESSURE FOR HYDROSTATIC TEST.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure >113 psi Test Temp.AMBIENT °F

SEAT LEAK TEST

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-AGTS1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 5-14-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

R P Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

m1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKWU1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-219A-P	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-219A-P	1993	REPLACEMENT	NO

7. Description of Work TIGHTENED NUTS AND ADDED JAM NUTS FOR SUPPORT.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKWU1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-21-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKWS1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System RHR

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-109-C	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-109-C	1993	REPLACEMENT	NO

7. Description of Work REPLACED NUTS AND WASHERS PER DISPOSITION.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKWS1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement

conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 1-12-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon R Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18-94, 19 ____

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKWZ1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System SERVICE WATER

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-324-D	1971	RPLACED	NO
HANGER	MAINTENAMCE	N/A	N/A	CPL-324-D	1993	REPLACEMENT	NO

7. Description of Work INSTALLED 1 NUT EACH SIDE AND INSTALLED NUTS AND LOCK NUTS TO SNUG TIGHT.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKWZ1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-21-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKWT1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System RHR

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-218-A	1971	REPAIRED	NO

7. Description of Work TIGHTENED NUTS AND CLEANED UP THREADS

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKWT1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this repair
repair or replacement

conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B Weber SR.SPECIALIST Date 12/20, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-21-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C. Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKWP1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-143-B	1971	REPAIRED	NO

7. Description of Work WELD REPAIRED SAW CUT IN BASE MATERIAL

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKWP1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this repair (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 1993

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-21-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY Date 12/20/93
Name

411 FAYETTEVILLE ST., RALEIGH, NC 27602 Sheet 1 of 1
Address

2. Plant H.B.ROBINSON Unit HBR2
Name

HWY.151 & SC 23 HARTSVILLE, SC 29550 WR/JO 93-AKWX1
Address Repair Organization PO NO., Job No., etc.

3. Work Performed by MAINTENANCE Type Code Symbol Stamp N/A
Name

Authorization No. N/A

SAME AS ITEM 2. Expiration Date N/A
Address

4. Identification of System RCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-116-E	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-116-E	1993	REPLACEMENT	NO

7. Description of Work 1/8" SHIM ADDED TO SUPPORT TO TAKE UP SLACK IN CLEARANCE.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F
VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

FORM NIS-2 (Back)

9. Remarks SEE WR/JO 93-AKWX1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 1993

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-22-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon R. Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKXS1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-247-C	1971	REPAIRED	NO

7. Description of Work RETENSIONED NUT TOP OF ROD AS REQUIRED TO PUT MODERATE TENSION ON ROD

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKXS1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this repair (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 1993

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-24-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AKXY1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-245-D	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-245-D	1993	REPLACEMENT	NO

7. Description of Work SQUARE NUT REMOVED AND REPLACED WITH HEX NUT AND WASHER PER DISPOSITION.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKXY1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-29-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 1994

1986 Edition | APPENDIX II - MANDATORY | Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) — Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) — Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) — Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) — WR/JO 93-AKXU1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) — Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) — Expiration Date N/A

4. Identification of System RHR

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
HANGER	EBASCO	N/A	N/A	CPL-218-D	1971	REPLACED	NO
HANGER	MAINTENANCE	N/A	N/A	CPL-218-D	1993	REPLACEMENT	NO

7. Description of Work REPLACED MISSING U-BOLT, NUT & SPACER ON SUPPORT PER DISPOSITION.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F
VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AKXU1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-29-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon C. Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/20/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-AMEM1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
BOLTS	EBASCO	N/A	N/A	RC FILTER	1971	REPLACED	NO
BOLTS	MAINTENANCE	N/A	N/A	RC FILTER	1993	REPLACEMENT	NO

7. Description of Work REPLACED BOLTING WITH NEW BOLTS AND GASKETS.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A F

VT-2 NO LEAKAGE

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-AMEM1 TURNOVER PACKAGE

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Veler SR.SPECIALIST Date 12/20, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 11-8-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/21/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 93-ABQK4 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System AUXILIARY FEEDWATER

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	AFW-24	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	AFW-24	1993	REPLACEMENT	NO

7. Description of Work REPLACED VALVE AFW-24 WITH NEW VALVE DUE TO LEAKAGE PAST THE SEAT.

8. Tests Conducted: Hydrostatic [X] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [ ] Pressure 110 psi Test Temp. AMBIENT °F

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 93-ABQK4 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/21/93, 19____

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 10-18-93 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Damon R. Wallace Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/22/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-AGAY1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	CVC-347	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	CVC-347	1993	REPLACEMENT	NO

7. Description of Work REPLACED VALVE CVC-347 BONNET AND DIAPHRAGM.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure Operating psi Test Temp. Operating °F

REF.ACR# 93-247

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-AGAY1 TURNOVER PACKAGE AND ACR # 93-247.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement
conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B Weber SR.SPECIALIST Date 12/22, 19 93
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 4-30-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P. Valladares Commissions TN971
Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/22/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-ANCM1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2. (Address) Expiration Date N/A

4. Identification of System CVCS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
VALVE	EBASCO	N/A	N/A	CVC-275A	1971	REPLACED	NO
VALVE	MAINTENANCE	N/A	N/A	CVC-275A	1993	REPLACEMENT	NO

7. Description of Work REPLACED VALVE CVC-275A BONNET, DIAPHRGM AND ONE NUT.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure Operating psi Test Temp.Operating°F

REF.ACR# 93-247

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

9. Remarks SEE WR/JO 92-ANCM1 TURNOVER PACKAGE AND ACR # 93-247

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement (repair or replacement) conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed Richard B. Weber SR.SPECIALIST Date 12/22, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 9-2-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon B. Valladares Commissions TN 971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-18, 19 94

1986 Edition APPENDIX II - MANDATORY Form NIS-2

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS

As Required by the Provisions of the ASME Code Section XI

1. Owner CAROLINA POWER & LIGHT COMPANY (Name) Date 12/16/93

411 FAYETTEVILLE ST., RALEIGH, NC 27602 (Address) Sheet 1 of 1

2. Plant H.B.ROBINSON (Name) Unit HBR2

HWY.151 & SC 23 HARTSVILLE, SC 29550 (Address) WR/JO 92-AMRY1 (Repair Organization PO NO., Job No., etc.)

3. Work Performed by MAINTENANCE (Name) Type Code Symbol Stamp N/A

Authorization No. N/A

SAME AS ITEM 2 (Address) Expiration Date N/A

4. Identification of System SIS

5. (a) Applicable Construction Code B31.1 19 67 Edition, N/A Addenda, N/A Code Case

(b) Applicable Edition of Section XI Utilized for Repairs or Replacements 19 86

6. Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufacturer Serial No.	National Board No.	Other Identification	Year Built	Repaired, Replaced, or Replacement	ASME Code Stamped (Yes or No)
RESTRAINT	MAINTENANCE	N/A	N/A	SEISMIC	1991	REPLACED	NO
RESTRAINT	MAINTENANCE	N/A	N/A	SEISMIC	1992	REPLACEMENT	NO

7. Description of Work REMOVED AND RE-INSTALLED SEISMIC RESTRAINT.

8. Tests Conducted: Hydrostatic [ ] Pneumatic [ ] Nominal Operating Pressure [ ]

Other [X] Pressure N/A psi Test Temp. N/A °F

VT-3

NOTE: Supplemental sheets in form of lists, sketches, or drawings may be used, provided (1) size is 8 1/2 in. x 11 in., (2) information in items 1 through 6 on this report is included on each sheet, and (3) each sheet is numbered and the number of sheets is recorded at the top of this form.

Form NIS-2 SECTION XI - DIVISION 1 1986 Edition

FORM NIS-2 (Back)

9. Remarks SEE WR/JO 92-AMRY1 TURNOVER PACKAGE.

Applicable Manufacturer's Data Reports to be attached

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this replacement
repair or replacement

conforms to the rules of the ASME Code, Section XI.

Type Code Symbol Stamp N/A

Certificate of Authorization No. N/A Expiration Date N/A

Signed [signature] SR.SPECIALIST Date 12/16, 19 93

Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TENNESSEE and employed by THE HARTFORD STEAM BOILER INSP.& INS. CO. of HARTFORD, CONNECTICUT have inspected the components described in this Owner's Report during the period 8-26-92 to 1-18-94, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspectors or his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Ramon P. Valladares Commissions TN971

Inspector's Signature National Board, State, Province, and Endorsements

Date 1-8, 19 94

EXAMINATION PROGRAM PLAN
FOR
CAROLINA POWER AND LIGHT COMPANY
H.B.ROBINSON UNIT #2
INSERVICE INSPECTION
INTERVAL-3 PERIOD-1 OUTAGE-2

ALL ITEMS AND AREAS LISTED BELOW WERE EXAMINED AS INDICATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 1986 EDITION OF SECTION XI TO THE EXTENT PRACTICAL WITH THE ACCESS PROVIDED AND THE LIMITATIONS OF COMPONENT GEOMETRY.

ITEM	X-2500-1	EXAMINATION AREA	UT	SURF	VT	SKETCH	REM
1	B1.40	HEAD/FLG. WELD 2	*	*	-	101	
2	B2.11	CIRC.WELD 5	*	-	-	103	
3	B2.12	LONG.WELD 1	*	-	-	103	
4	B2.40	T/S HEAD WELD 1	*	*	-	105A	
5	B3.120	NOZZ.I.R. SPRAY	*	-	-	103	
6	B3.140	I.R. S/G A IN&OUT	-	-	*	105	
7	B5.40	NOZZ.SE WELD 4&4DM	*	*	-	108	&B9.11
8	B5.40	NOZZ.SE WELD19&19DM	*	*	-	116B	&B9.11
9	B5.70	NOZZ.SE WELD 4&4DM	*	*	-	107	&B9.11
10	B5.70	NOZZ.SE WELD 5&5DM	*	*	-	107	&B9.11
11	B6.10	RV HEAD NUTS 1-17	-	*	-	101B	
12	B6.50	WASHERS 1-17	-	-	*	101B	
13	B6.180	PMP/A STUDS 3,4,6,7, 10,12,14,20 & 23	*	-	-	144	
14	B7.10	CONOSEAL A&B ASSY'S	-	-	*	101C	
15	B7.20	MANWAY BOLTS 1-5	-	-	*	103	
16	B7.30	A S/G HL STUDS 16	-	-	*	105	
17	B7.30	A S/G CL STUDS 16	-	-	*	105	
18	B7.50	551A FLG BOLTS 8	-	-	*	118	
19	B7.60	A PMP S/H BOLTS 18	-	-	*	144	
20	B7.70	V750 BOLTS/STUDS	-	-	*	109	
21	B7.70	V751 BOLTS/STUDS	-	-	*	109	
22	B7.70	V875A BOLTS/STUDS	-	-	*	110	
23	B7.70	V875D BOLTS/STUDS	-	-	*	110	
24	B7.70	V875B BOLTS/STUDS	-	-	*	111	
25	B7.70	V875E BOLTS/STUDS	-	-	*	111	
26	B7.70	V875C BOLTS/STUDS	-	-	*	112	
27	B7.70	V875F BOLTS/STUDS	-	-	*	112	
28	B7.70	V876A BOLTS/STUDS	-	-	*	113	
29	B7.70	V876B BOLTS/STUDS	-	-	*	114	
30	B7.70	V876C BOLTS/STUDS	-	-	*	115	
31	B7.70	V455B BOLTS/STUDS	-	-	*	116	
32	B7.70	V455A BOLTS/STUDS	-	-	*	116A	
33	B7.70	V535 BOLTS/STUDS	-	-	*	117A	
34	B7.70	V536 BOLTS/STUDS	-	-	*	117A	
35	B7.70	V456 BOLTS/STUDS	-	-	*	117A	
36	B7.50	S/INJ FLG BOLTS 1-4	-	-	*	132	
37	B9.11	WELDS 6,9&12	*	*	-	107	
38	B9.11	WELD 3	*	*	-	108	
39	B9.11	WELD 11	*	*	-	109	
40	B9.11	WELDS 13 & 15	*	*	-	110	

41	B9.11	WELD 11	*	*	-	111	
42	B9.11	WELDS 10 & 11	*	*	-	112	
43	B9.11	WELDS 3 & 5	*	*	-	116	
44	B9.11	WELD 13	*	*	-	116B	
45	B9.11	WELD 11	*	*	-	117A	
46	B9.11	WELDS 4 & 5	*	*	-	118	
47	B9.12	WELD 9IL & 9EL	*	*	-	107	
48	B9.21	WELD 1	-	*	-	119	
49	B9.21	WELDS 18 & 19	-	*	-	122	
50	B9.21	WELDS 27 & 28	-	*	-	122A	
51	B9.21	WELDS 64 & 65	-	*	-	123	
52	B9.21	WELDS 31 & 32	-	*	-	123A	
53	B9.21	WELDS 3 & 4	-	*	-	124	
54	B9.21	WELDS 49 & 50	-	*	-	125	
55	B9.31	WELD 1BC	*	*	-	108	
56	B9.32	WELD 1BC	-	*	-	125	
57	B9.40	SOCKET 10A	-	*	-	117A	
58	B9.40	SOCKETS 3,33 & 34	-	*	-	125	
59	B9.40	SOCKET 3	-	*	-	126	
60	B9.40	SOCKET 3	-	*	-	127	
61	B9.40	SOCKETS 6D & 6E	-	*	-	128	
62	B9.40	SOCKET 2	-	*	-	129	
63	B9.40	SOC.6 TO 15,16&17	-	*	-	132	
64	B9.40	SOCKET 4	-	*	-	135	
65	B9.40	SOCKET 1	-	*	-	140	
66	B9.40	SOCKETS 2,3 & 18	-	*	-	141	
67	B9.40	SOCKETS 2 & 3	-	*	-	142	
68	B9.40	SOCKETS 14 TO 17	-	*	-	143	
69	B14.10	CRDH WELD 1	-	*	-	101C	
70	15.10/17	PRESSURE TEST	-	-	*	N/A	
71	C1.10	WELD 5	*	-	-	205	
72	C1.10	WELD 6	*	*	-	205	
73	C1.10	WELDS 1 & 2	*	-	-	207	
74	C2.21	NOZZ.WELDS 7 & 8	*	*	-	205	
75	C2.22	NOZZ.I.R. 7 & 8	*	-	-	205	
76	C3.20	INT.ATT.A-WS&F-WS	-	*	-	212	
77	C3.20	INT.ATT.A-WS	-	*	-	213	
78	C3.20	INT.ATT.I-WS&G-WS	-	*	-	216	
79	C3.20	INT.ATT.H-WS	-	*	-	219	
80	C3.20	INT.ATT.A-WS	-	*	-	232A	
81	C3.20	INT.ATT.A-WS	-	*	-	234B	
82	C5.11&12	WELDS 1&2+2.5t LS	*	*	-	218	
83	C5.11&12	weld 186+2.5t LS	*	*	-	219	
84	C5.30	SOCKETS 3,4,6,7&8	-	*	-	243	
85	C5.30	SOCKETS 27 & 28	-	*	-	245	
86	C5.51&52	WELD1,7,8,9,24&LS	*	*	-	212	
87	C5.51&52	WELD1,2,4,14&LS	*	*	-	215	
88	C6.20	744A BODY WELD V1	-	*	-	219	
89	C7.10/70	PRESSURE TEST	-	-	*	N/A	
90	N/A	WELD 30 BEST EFFORT	*	-	-	231	AUG.
91	N/A	WELD 16 BEST EFFORT	*	-	-	232	AUG.
92	N/A	WELD 17 BEST EFFORT	*	-	-	232	AUG.
93	N/A	WELD 4 BEST EFFORT	*	-	-	232A	AUG.
94	D1.10	PRESSURE TEST	-	-	*	N/A	

95	D2.10	PRESSURE TEST	-	-	*	N/A
96	D3.10	PRESSURE TEST	-	-	*	N/A
97	F-A ITEM	SUPPORT SKIRT	-	-	*	103
98	F-B ITEM	SUPPORTS A & B	-	-	*	105A
99	F-C ITEM	SUPPORT A	-	-	*	108
100	F-C ITEM	SUPPORT C	-	-	*	109
101	F-C ITEM	SUPPORTS C & D	-	-	*	110
102	F-C ITEM	SUPPORTS E&Y	-	-	*	116
103	F-C ITEM	SUPPORT E	-	-	*	116B
104	F-C ITEM	SUPPORT W	-	-	*	122A
105	F-C ITEM	SUPPTS. DD,EE&FF	-	-	*	123
106	F-C ITEM	SUPPTS.OO,O,P&Q	-	-	*	123A
107	F-C ITEM	SUPPTS.G,H,I&J	-	-	*	124
108	F-C ITEM	SUPPTS.A,B,C&D	-	-	*	125
109	F-C ITEM	SUPPTS.AA,A,B&C	-	-	*	134
110	F-C ITEM	SUPPTS. A&B	-	-	*	142
111	F-C ITEM	SUPPTS. A&B	-	-	*	143
112	F-C ITEM	K,L,M,N,H1,H&H2	-	-	*	143
113	F-B ITEM	SUPPTS. A,B&C	-	-	*	144
114	F-C ITEM	SUPPT.&I.A. A&F	-	-	*	212
115	F-C ITEM	SUPPTS. B&C	-	-	*	212
116	F-C ITEM	SUPPTS.&I.A. A	-	-	*	213
117	F-C ITEM	SUPPTS. C&E	-	-	*	213
118	F-C ITEM	SUPPT.&I.A. A&B	-	-	*	214
119	F-C ITEM	SUPPTS. C1 &Q	-	-	*	214
120	F-C ITEM	SUPPTS.D,H,I,J&J1	-	-	*	215
121	F-C ITEM	SUPPT.&I.A. I&G	-	-	*	216
122	F-C ITEM	SUPPTS.D,G&J	-	-	*	217
123	F-C ITEM	SUPPTS.A,B,P,C&D	-	-	*	218
124	F-C ITEM	SUPPTS.A,B,C&D	-	-	*	219
125	F-C ITEM	SUPPTS.&I.A. H	-	-	*	219
126	F-C ITEM	SUPPTS. O&P	-	-	*	219A
127	F-C ITEM	SUPPT.&I.A. A	-	-	*	232A
128	F-C ITEM	SUPPORTS B&C	-	-	*	232A
129	F-C ITEM	SUPPTS.&I.A. A	-	-	*	234B
130	F-C ITEM	SUPPORTS B,C&D	-	-	*	234B
131	F-C ITEM	A,B,C1,D,E,F&G	-	-	*	245
132	F-C ITEM	SUPPTS.A,B,C,D&E	-	-	*	246
133	F-C ITEM	A,B,C,D,E,F,G&H	-	-	*	247
134	F-C ITEM	SUPPTS. A,B,C&D	-	-	*	324B
135	F-C ITEM	SUPPTS. Q,S,T&U	-	-	*	324D

AUGMENTED EXAMINATIONS

136	N/A	FEEDWATER NOZZLES TO REDUCERS TO ELBOWS INCLUDING BASE MATERIAL ON LOOPS A,B & C	*	-	-	215 216 217
137	N/A	ACCUMULATOR NOZZLE EXAMINATIONS	*	-	-	N/A

ADDITIONAL EXAMINATIONS PER IWB-2430

138	B9.40	SOCKET WELD 42A	-	*	-	122A
139	B9.40	SOCKET WELDS 4,35&36	-	*	-	125
140	B9.40	SOCKET WELD 4	-	*	-	127
141	B9.40	SOCKET WELD 5A	-	*	-	128
142	B9.40	SOCKET WELDS 14,15,16-17,8,9,11,12,12A,12B, 13 & 10	-	*	-	133
143	B9.40	SOCKET WELD 1	-	*	-	136
144	B9.40	SOCKET WELDS 18A&18B	-	*	-	141
145	B9.40	SOCKET WELDS 2A,3A&6	-	*	-	142
146	B9.40	SOCKET WELDS 19,19A, 19B & 18	-	*	-	143
147	N/A	FLYWHEEL RCP A GOUGE	-	*	*	144A

INTRODUCTION

This report presents the results of the Inservice Inspection (ISI) of the second outage, first period, third interval and Preservice Inspection (PSI) of new piping at the H. B. Robinson Steam Electric Plant, Unit 2. These examinations were conducted from September through October 1993. Nuclear Energy Services conducted these examinations in accordance with the program plan located under Tab C of this report. The program plan was derived from the Inservice Ten Year Inspection Plan. This plan is based on the requirements of the ASME Code, Section XI 1986 Edition and the Carolina Power & Light Specification No. HBR–ISI–1.

RESULTS

All scheduled nondestructive examinations performed during this ISI are documented on examination data sheets. Included on these examination data sheets are the component or system identification, examination method and procedure employed, unique data sheet number, and all applicable equipment settings and examination conditions. The data sheets, together with applicable isometric sketches, are presented in numerical order under Tab D of this report. Included under Tab D is the examination data for detection of thermal fatigue cracking in steam generator feedwater nozzles. (No evidence of thermal fatigue cracking was found). In the event that a recordable indication was detected, all pertinent information was documented on the appropriate data sheet for evaluation. The evaluations of any recordable indications are located under Tab F of this report. A summary of indications is as follows:

CLASS I

Volumetric examinations detected no flaw indications that exceeded the standards of ASME, Section XI, IWB–3000.

Surface examinations detected recordable indications in one piping weld and one steam generator weld. As a result of the piping flaw indication, an additional number of examinations were performed in accordance with IWB–2430. The data for the additional workscope can be found in the Expanded Scope section under Tab D of this report. The indications detected in the steam generator weld was dispositioned in accordance with CP&L Work Request 92–APTY1. All indications are summarized under Tab F of this report.

CLASS II

Neither volumetric or surface examinations detected flaws that exceeded the standards of ASME, Section XI, IWC–3000. Automated ultrasonic examinations of previously recorded indications in Steam Generator "A", weld number 5, revealed no significant change in the size or location of the indications. The data for these examinations is provided in a separate report.

IWF–1000

Visual examination of Class I, II and III component supports revealed several items with recordable indications. After engineering evaluation all component supports were found to be acceptable. All indications are summarized under Tab F of this report.

Carolina Power & Light Company
Nuclear Engineering Department
Raleigh, North Carolina

R0595

Company Correspondence

JUN 21 1993

File: RET-R-90-207

NED-R-6643

10 12040

MEMORANDUM TO: Mr. T. P. Cleary

FROM: R. Hanford

SUBJECT: H. B. Robinson RFO-15 Steam Generator Girth Weld Reinspection Activities (PCN 91-207/00)

The attached information summarizes RFO-13 and RFO-14 examination activities on the Robinson steam generator (SG) girth welds. Recommendations are also provided for RFO-15 reexamination activities and repair contingencies for these same weld joints.

The attached summary indicates that the reinspection requirements of the 1986 Edition to ASME Code Section XI were completely satisfied for the SG girth welds by the reexamination activities conducted in RFO-14. Based on the RFO-14 reexamination results, future reinspection of RNP SG girth welds would not be required by ASME Code Section XI until the next 10 year ISI interval. However, as stated in the attachment to this letter, it is recommended that the indications on SG "A" (only) be reexamined in RFO-15.

The NED Materials Engineering Unit will again provide engineering support for the RFO-15 reinspection activities for the steam generator girth welds. If there are any questions concerning the attached information, please contact Charlie Griffin of the NED Materials Engineering Unit (Caronet 8-770-2508).

Charlie Griffin
For Ray Hanford

CHG/mlf

Attachment

cc: Mr. E. M. Black - W/A
Mr. J. M. Curley - W/A
Mr. B. E. Harward - W/A
Mr. J. W. Lane - W/A
Mr. C. Osman - W/A
Mr. I. D. Simpson - W/A

Page 1 of 8

H. B. ROBINSON RFO-15 STEAM GENERATOR GIRTH WELD REINSPECTION ACTIVITIES (PCN 91-207/00)

BACKGROUND

During the 10 year ISI activities conducted in RFO-13 (third period of the second interval), ultrasonic examination (UT) of the steam generator (SG) girth welds (located between the dome and the lower shell transition cone) revealed weld metal UT indications requiring engineering evaluation. This weld joint was one of the closure joints for the steam generator replacement activities in 1984. To better characterize the UT indications, visual examination (VT) and magnetic particle examination (MT) was performed on selected ID connected surface indications on SG "A". Although it was believed that these UT indications were actually related to weld geometry and/or fabrication flaws dating back to the 1984 replacement activities (not service-related), eight UT indications on SG "A" and twenty six on SG "C" exceeded the allowable flaw size criteria of Subsection IWB-3500 to ASME Code Section XI (1977 Edition, Summer 1978 Addenda) thereby necessitating further analysis.

It was believed by the CP&L Metallurgical Services Section (MSS) inspection personnel and the Nuclear Engineering Department (NED) - Materials Engineering Unit that these UT indications had been oversized by the Westinghouse UT inspection personnel who actually performed the RFO-13 UT inspections. This belief was based on CP&L calibration checks of the manual UT techniques used by Westinghouse, physical access restrictions to the weld joints, and the actual VT/MT sizing of select SG "A" indications by MSS and NED - Materials Engineering Unit personnel. However, the oversizing effect could not be accurately quantified/verified during the outage. Since the UT indications exceeded ASME Code Section XI, Subsection IWB-3500, acceptance standards, the NED - Materials Engineering Unit contracted Structural Integrity Associates, Inc. (SIA) to evaluate these UT indications in accordance with Subsection IWB-3600 (stress analysis) to determine whether continued operation with the observed flaws was acceptable.

SIA performed the necessary stress analysis to justify continued operation in accordance with Subsection IWB-3600 and Appendix A of ASME Code Section XI (Reference: SIA Report SIR-90-080 Revision 1, March 1991). In the referenced report, SIA stated that reexamination of the observed UT indications exceeding IWB-3500 acceptance criteria would be necessary during each of the next three (3) successive inspection periods, as required by Subsection IWB-2420 of ASME Code Section XI for Class 1 components.

NOTE: The secondary side of the RNP steam generators are actually classified by design as ASME Code Class 2. However, with the understanding that the RNP vessels were Class 1 (primary side is Class 1), SIA used IWB-3000 subsections for the acceptance criteria and stress analysis during RFO-13 (vs. IWC-3000 for Class 2). Since separate acceptance criteria for Class 2 components had not yet been developed in the 1977 Edition, Summer 1978 Addenda of ASME Code Section XI (Code to which RNP was committed during RFO-13), the use of IWB-3000 was appropriate. However, SIA also referred to Subsection IWB-2420 for reexamination requirements vs. IWC-2420 which would be applicable to ASME Class 2 components. It is important to recognize that Subsection IWC-2420, which should have previously been applied for these weld joints would have only required one (1) reexamination vs. the three (3) reexaminations specified by SIA.

To comply with the ASME Section XI requirements, these UT indications were reexamined during RFO-14. However, to provide for more accurate/ reproducible sizing of the UT indications and to eliminate the perceived oversizing/geometry effects experienced in RFO-13, a "semi-automated" examination was performed using a computerized P-Scan ultrasonic system.

The P-Scan system scans and stores data at a sensitivity level much greater than that required by ASME Section XI and also corrects for "beam spread", a phenomenon which can result in oversized measurements of UT flaws/reflectors. Siemens Nuclear Services performed the RFO-14 P-Scan examinations. To allow optimum comparison of the RFO-13 and RFO-14 examination results, calibration sensitivity for the P-Scan was established by Siemens using the same technique as that used previously by Westinghouse in RFO-13. Using the same calibration as used by Siemens and Westinghouse, CP&L also verified the RFO-14 P-Scan results using manual UT techniques. RFO-14 reexamination results were compared against Tolerable Flaw Diagrams which had been developed by SIA specifically for the RNP steam generator girth welds (Reference: SIA Report SIR-91-046 Revision 0, August 1991). These Tolerable Flaw Diagrams provided a means to easily assess the acceptance of the UT indications to either IWB-3500 and/or IWB-3600 criteria of the 1986 Edition of ASME Code Section XI (Code to which RNP was committed for ISI, effective February 1992).

RFO-14 REEXAMINATION RESULTS

A summary of the RFO-14 reexamination results follows:

- **STEAM GENERATOR A**

  Five recordable UT indications were found. All UT indications were determined to be an acceptable size per Subsection IWB-3500 of ASME Code Section XI. With the advantage of beam spread correction, the aspect ratios for all recordable UT indications decreased from that measured by the Westinghouse manual UT techniques in RFO-13.

- **STEAM GENERATOR C**

  Nine recordable UT indications were found. All UT indications were found to be an acceptable size per Subsection IWB-3500 of ASME Code Section XI. For all recordable UT indications, the aspect ratios decreased from that measured by the Westinghouse manual UT techniques in RFO-13. The remaining RFO-13 UT indications were determined to be either non-recordable or caused by weld geometry.

CONCLUSIONS AND RECOMMENDATIONS

The RFO-14 UT inspection activities satisfied the reinspection requirement of Subsection IWC-2420 for both the 1977 Edition Summer 1978 Addenda (RFO-13 Code) and the 1986 Edition (current RNP Code) of ASME Code Section XI. Based on the RFO-14 UT inspection results, none of the UT indications exceeded Subsection IWB-3500 acceptance criteria, therefore reinspection of neither SG girth weld would be required by the 1986 Edition of ASME Code Section XI until the next 10 year ISI interval. However, it is recommended that the indications on SG "A" (only) be reexamined in RFO-15 for the following reasons:

- As noted above, the UT technique was changed for the RFO-14 reinspection (use of P-scan vs. manual UT). Using the P-scan, CP&L was able to establish that none of the UT indications exceeded Subsection IWB-3500 acceptance criteria, but the question that could not be answered was whether the UT indications actually changed size without having a comparable "baseline" against which to compare the RFO-14 results. The RFO-14 reinspection established a new "baseline" for the comparison of future examination results. Reexamination of SG "A" UT indications in RFO-15 would allow validation of the P-scan inspection technique and the RFO-14 "baseline" data.

- Although each of the UT indications on both SG's was demonstrated to meet IWB-3500 acceptance criteria during RFO-14, one P-scan indication on SG "A" (P-scan Number 3) appeared to actually be **longer** than first observed in RFO-13 (2.0 inches long during RFO-14 vs. 1.125 inches long during RFO-13). It was later determined, through the use of both P-scan and manual UT techniques, that the indication was actually a 1 inch long recordable UT indication (>50% DAC) adjacent to a 1/2 inch long non-recordable UT indication which were separated by 1/2 inch. The total reported length of 2 inches was used for evaluation during RFO-14 against IWB-3500 acceptance criteria and determined to be an acceptable size (See Attachment 1 - SIA Letter No. HLG-92-018, dated May 12, 1992). Reinspection of this UT indication during RFO-15 will allow further verification that it is not a service related flaw.

Based on the UT inspection data from the past two outages that CP&L has collected on these weld joints, it is not likely that any weld repairs would be necessitated by the RFO-15 reinspection activities. However, a repair contingency plan needs to be established before the outage. As was the case prior to RFO-14, it is recommended that Welding Services, Inc. (WSI) out of Norcross, Ga. be included as part of this contingency. WSI was the contractor that successfully performed the extensive repairs to the SG girth welds at Indian Point. The Indian Point work required the design and fabrication of specialized machining and welding equipment by WSI, including a steam generator mock-up used for the training and qualification of repair personnel. WSI also has the necessary qualified welding procedures in-place to accomplish any girth weld repairs that CP&L could encounter. If weld repairs are necessitated, the NED - Materials Engineering Unit has concluded that WSI is clearly the most qualified contractor to support this effort based on their previous experience, available equipment, and readiness to mobilize quickly on SG repairs (See Attachment 2 for additional information).

ATTACHMENT 1

SIA LETTER NO. HLG-92-018, DATED MAY 12, 1992

STRUCTURAL INTEGRITY ASSOCIATES, INC.

3150 Almaden Expressway
Suite 145
San Jose, CA 95118
(408) 978-8200
FAX: (408) 978-8964
or (408) 978-0438

Fossil Plant Operations
66 South Miller Road
Akron, Ohio 44333
(216) 864-8886
FAX: (216) 864-5705

May 12, 1992
HLG-92-018

RH 5/19/92

Mr. Ray Hanford
Carolina Power and Light Company
411 Fayetteville Street
Post Office Box 1551
Raleigh, NC 27602

Subject: Preliminary Evaluation of Flaw Observed in H. B. Robinson Steam Generator A

Dear Ray:

Structural Integrity Associates has performed a preliminary evaluation of the flaw observed in Steam Generator A which exceeded the acceptance criteria contained in the flaw tolerance figures which we previously prepared for Carolina Power and Light (CP&L). The reported flaw was characterized as a surface flaw with depth of 0.138 inches and length of 2 inches. This flaw was previously detected during the 1990 examination. At that time, the indication was reported as having a depth of 0.292 inches, and a length of 1.125 inches. We believe that the reported differences are due to differences in inspection technique rather than any significant difference in the flaw itself.

The flaw as reported during the 1992 examination is acceptable without further action or repair by the criteria of ASME Section XI, Table IWB-3514-1 (1986). Using that Table, a flaw detected during an inservice inspection is acceptable with the reported A/L = 0.138"/2" = 0.069 if the reported A/T is less than about 7%. The present A/T = about 4%.

Since the data suggests that there has been no real change in the flaw character since the previous inspection, the conclusion reached in 1990 that the indication is a fabrication related defect (e.g., porosity) is still supported.

We are reviewing the formal calculation supporting the above conclusion, and will transmit that calculation for your records within a few days. The above conclusions are not expected to change as a result of that calculation.

If you have any questions regarding the above, please call.

Sincerely,

H. L. Gustin, P. E.
Associate

cc: C. Griffin
R. Cooper
CPL-20Q-102

6

ATTACHMENT 2

E-MAIL MEMO ON REPAIR CONTINGENCIES

To: Garry Haywood@CA@CPL RNP
Cc: JEFF LANE@PLANT@CPL RNP,Joe Curley@RNP@CPL NED
Bcc:
From: Charlie Griffin@RNP@CPL NED
Subject: STEAM GENERATOR GIRTH WELD CONTINGENCY
Date: Friday, May 28, 1993 10:59:03 EDT
Attach:
Certify: Y
Forwarded by:

I AM CONTINUING TO WRITE THE SUMMARY OF RFO-14 ACTIVITIES RELATIVE TO THE STEAM GENERATOR GIRTH WELDS AND RFO-15 RECOMMENDATIONS. HOPE TO HAVE THE LETTER OUT NEXT WEEK. DECIDED TO SEND YOU THIS TO HELP JUSTIFY SOLE-SOURCING THE GIRTH WELD CONTINGENCY CONTRACT.

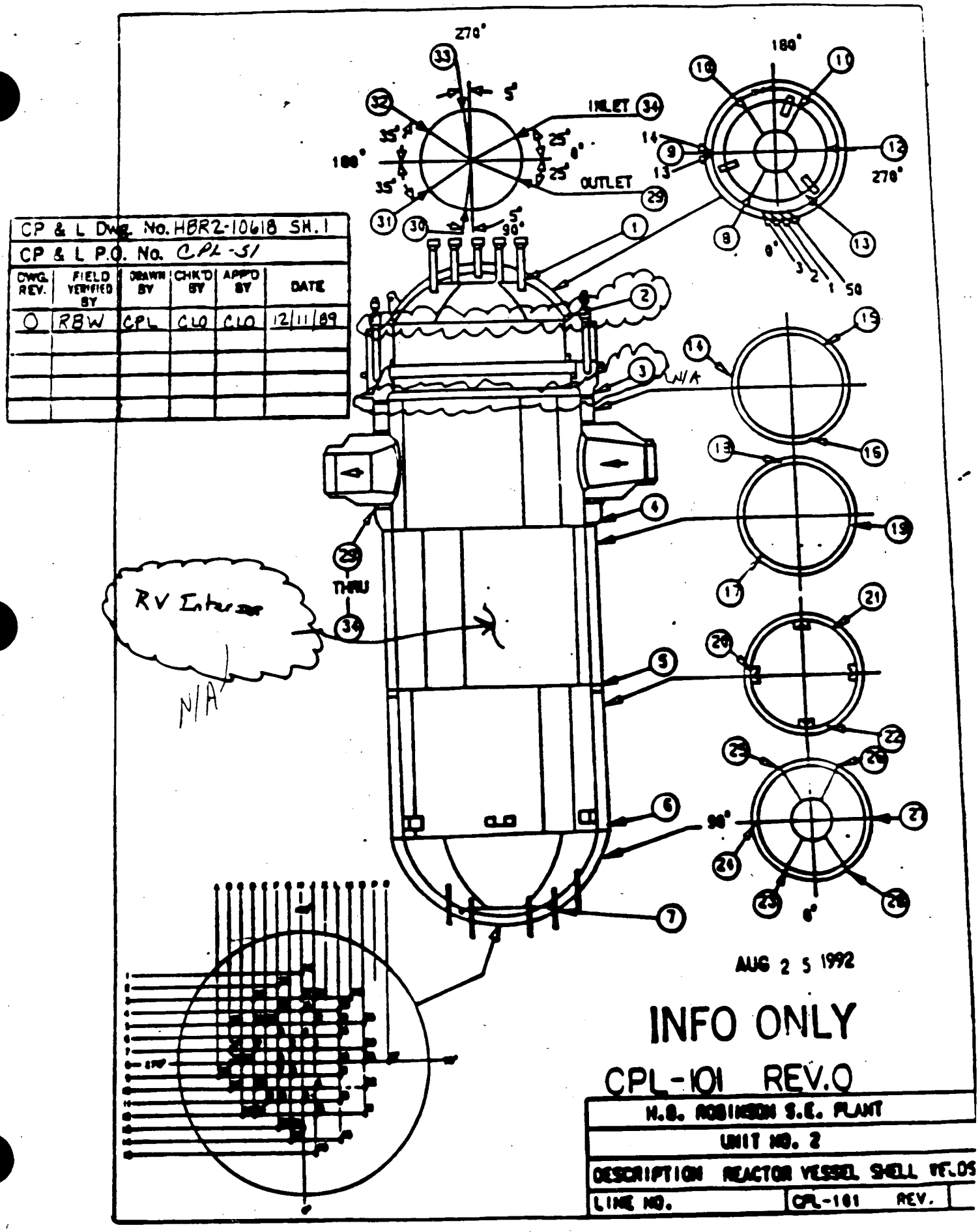
I AM RECOMMENDING THAT WELDING SERVICES INC. (WSI) OUT OF NORCROSS, GEORGIA BE THE CONTRACTOR FOR THE STEAM GENERATOR GIRTH WELD CONTINGENCIES. WSI WAS THE CONTRACTOR THAT PERFORMED THE EXTENSIVE REPAIRS TO THE GIRTH WELDS AT INDIAN POINT. THIS WORK REQUIRED EXTENSIVE WELDING/MACHINING EQUIPMENT DESIGN/ FABRICATION BY WSI. THEY CLEARLY HAVE THE BEST EXPERIENCE AND EQUIPMENT FOR ACCOMPLISHING ANY NEEDED REPAIRS TO STEAM GENERATOR GIRTH WELDS. CP&L HAS A GENERAL SERVICES CONTRACT IN PLACE FOR WSI.

IN PREPARATION FOR RFO-14, RAY HANFORD AND MYSELF TRAVELLED TO THE WSI FACILITY IN GEORGIA AND SAW ACTUAL STEAM GENERATOR MOCK-UPS WHICH THEY DEVELOPED FOR THE INDIAN POINT WORK. THESE MOCK-UPS PERMIT WSI TO TRAIN AND PRACTICE IN NDITIONS WHICH VERY CLOSELY SIMULATE THE INSIDE OF A STEAM GENERATOR SUCH AS THOSE AT RNP. DURING RFO-13, RNP BORROWED SCAFFOLDING, DEVELOPED BY WSI FOR THE WORK AT INDIAN POINT, WHICH ALLOWS QUICK ASSEMBLY INSIDE A STEAM GENERATOR (IF WE HAVE TO GO INSIDE OUR STEAM GENERATORS IN RFO-15, WE WILL ONCE AGAIN NEED THIS SPECIAL SCAFFOLDING). WSI HAS ALSO DEVELOPED A TRACK SYSTEM FOR ATTACHMENT INSIDE THE STEAM GENERATOR WHICH ALLOWS USE OF MACHINING EQUIPMENT AND AUTOMATED WELDING EQUIPMENT ON THE SAME TRACK (ELIMINATES THE NEED TO CHANGE-OUT TRACKS WHEN GOING FROM MACHINING TO WELDING). WSI HAS THE NECESSARY WELDING PROCEDURES TO ACCOMPLISH ANY NEEDED CP&L REPAIRS IN A TURN-KEY FASHION (CP&L PAID WSI APPROX. $6k IN 1992 TO QUALIFY A TEMPERBEAD PROCEDURE FOR USE AT RNP IF THE NEED SHOULD ARISE). WITH WSI's PROVEN EXPERIENCE AND EQUIPMENT, RNP SHOULD NOT SEEK OTHER VENDORS FOR THIS WORK WHICH MIGHT USE RNP AS THEIR "TRAINING GROUND" FOR STEAM GENERATOR GIRTH WELD REPAIRS.

BASED ON OUR RFO-14 INSPECTION RESULTS, I WOULD NOT ESTIMATE THAT RNP WILL HAVE A NEED TO MAKE REPAIRS TO THE GIRTH WELDS IN RFO-15, BUT WE DO NEED A REPAIR CONTINGENCY IN-PLACE. WSI IS CLEARY THE BEST CHOICE FOR THIS REPAIR CONTINGENCY! THIS WORK SHOULD NOT BE ADDED AS A "RIDER" TO A CONTRACT FOR THE UPCOMING SERVICE WATER PENETRATION WELDING....THERE IS A BIG DIFFERENCE IN A CONTRACTOR THAT CAN WELD THE SERVICE WATER PENETRATIONS AND ONE THAT CAN HANDLE A MAJOR OPERATION SUCH AS STEAM GENERATOR GIRTH WELD REPAIRS. I CANNOT CONSIDER THE TWO VENDORS, CURRENTLY UNDER CONSIDERATION FOR THE SERVICE WATER CONTRACT, TO BE EQUALLY QUALIFIED WITH WSI FOR STEAM GENERATOR GIRTH WELD REPAIRS.

RELATIVE TO THE OTHER STEAM GENERATOR PROJECT CONTINGENCIES FOR RFO-15 (MANWAY REPAIR, FEEDWATER NOZZLE REDUCER REPLACEMENTS), I CANNOT GIVE TECHNICAL JUSTIFICATION TO FAVOR ONE VENDOR OVER ANOTHER.

HOPE THIS ANSWERS YOUR QUESTIONS AND PROVIDES SUFFICIENT JUSTIFICATION, AS DISCUSSED LAST WEEK.



CP & L Dwg. No. HBR2-10618 SH. 1					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/89

AUG 2 5 1992

INFO ONLY

CPL-101 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION REACTOR VESSEL SHELL PT.05	
LINE NO.	CPL-101 REV.

DATA SHEET NO. 1218-016
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 8 INCHES
MATERIAL C/S
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED REACTOR VESSEL SHELL WELDS ISO/DWG/SK. # CPL-101 REVISION 0

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 834067
Color RED

EQUIPMENT

Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 2	NO RECORDABLE INDICATIONS EXAMINED FROM STUD HOLE 1-17	X	N/A
	N/A		

EXAMINER Bernard R. Kane LEVEL II DATE 10-13-93
EXAMINER Steve Wollum LEVEL II DATE 10-13-93
REVIEWER Scott Lamm LEVEL III DATE 10-13-93
REVIEWER Richard B. Weber DATE 10/13/93
REVIEWER A Belladonna DATE 10/13/93

DATA SHEET NO. 1222 - 006
PAGE 1 OF 6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

CPL-101 WELD #2

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.30 Delay 8.20
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 8 dB
Reference Sensitivity 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. G09014
Size 1.0"
Frequency 2.25 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG-58A/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-47
"T" 8.0" Dia. N/A
Temperature 68 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = 1.0"
Remarks N/A

VERTICAL LINEARITY

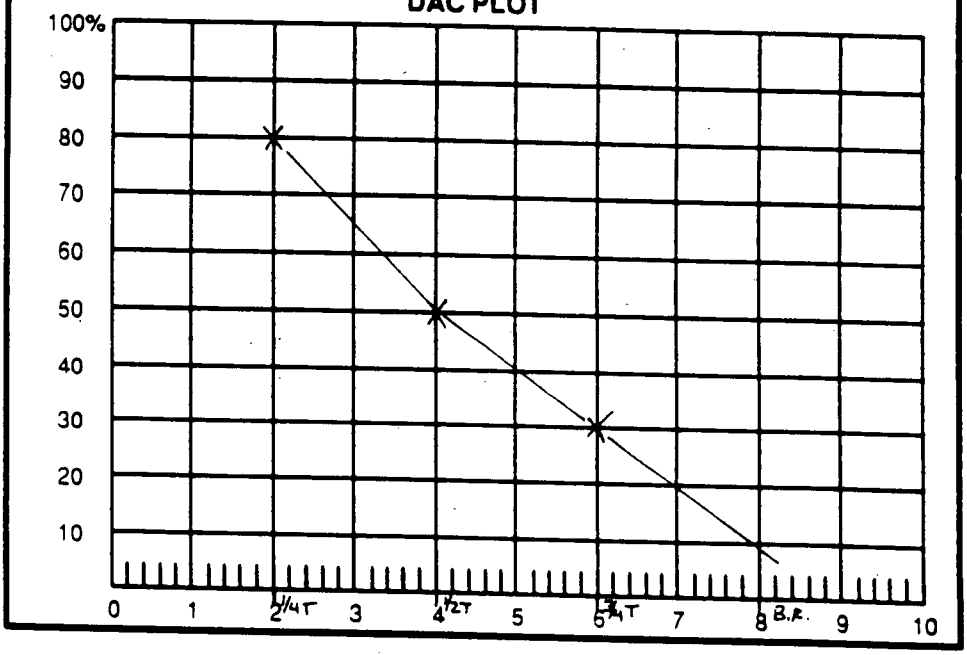
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0755
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	0930

REMARKS:

EXAMINERS 1 David M Master LEVEL II DATE 10/13/93
2 N/A LEVEL N/A DATE N/A

REVIEWERS 1 Scott Spring LEVEL III DATE 10-13-93
2 Richard B Weber LEVEL N/A DATE 10/13/93
3 A Balladares LEVEL A/II DATE 10-13-93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-006
PAGE 2 OF 6

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM #2/R.V. SHELL
ISO/DWG. NO. CPL-101 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 68 ° F

EXAM ITEM: CPL-101 WELD # 2

SCAN 0 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: SHELL TO FLANGE. EXAMINED FROM STUD HOLE #1 THROUGH #17.
SEE PREVIOUS I.S.I DATA (9-29-90) FOR LIMITATIONS.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 David H Martin LEVEL II DATE 10/13/93
2 N/A LEVEL N/A DATE N/A

REVIEWERS:
1 [signature] LEVEL III DATE 10-13-93
2 [signature] LEVEL N/A DATE 10/13/93
3 [signature] LEVEL ANII DATE 10/13/93

DATA SHEET NO. 1222-006
PAGE 3 OF 6
(From Studs #1-17)
CPL-101 Weld #2

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 6.14 Delay 7.90
Range 10
Gain (coarse) L 20 / = 20 dB
Gain (fine) L 10 / = 10 dB
Reference Sensitivity L 30 / = 30 dB
Remarks: N/A

SEARCH UNIT

Serial No. G10188
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG-58A/U
Cable Length 12'
Remarks: .7" Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-47
"T" 8.0" Dia. N/A
Temperature 68 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = 1.5"
Remarks 15" Screen

COUPLANT

Brand Ultragel II
Batch No. 092031

VERTICAL LINEARITY

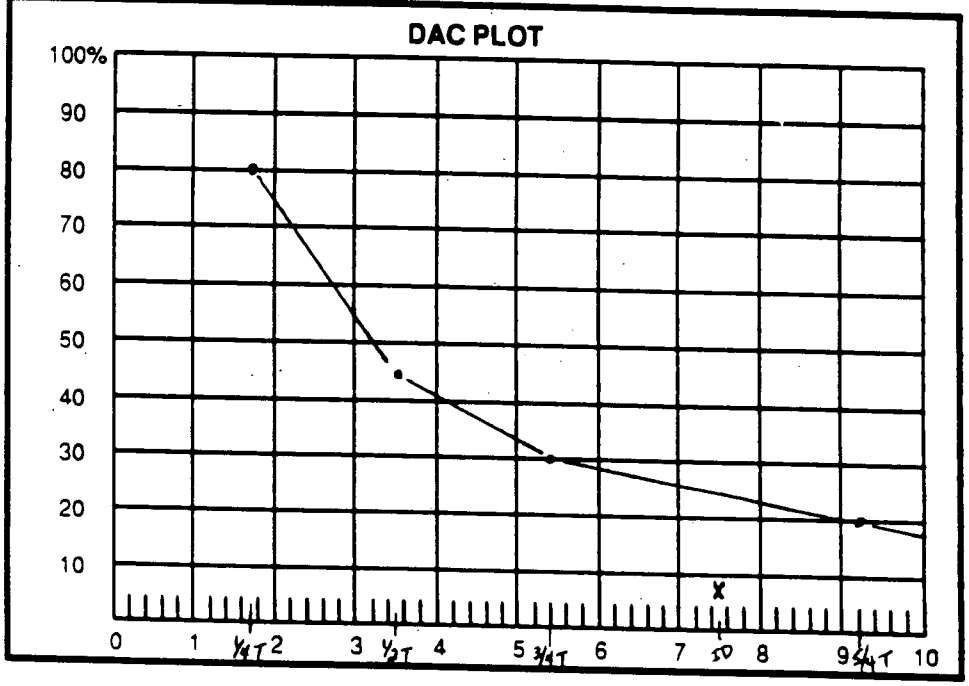
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	18
40	+6	80
20	+12	82

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0752
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	0931

REMARKS: X= ID Notch
-4 db Difference between 3/4 T and 5/4 T Hole

EXAMINERS	1	Tim Oldham	LEVEL	II	DATE 10-13-93
	2	David W Martin	LEVEL	II	DATE 10/13/93
REVIEWERS	1	Scott Lam	LEVEL	III	DATE 10-13-93
	2	Richard B. Weber	LEVEL	N/A	DATE 10/13/93
	3	R Balladares	LEVEL	ANII	DATE 10/13/93

DATA SHEET NO. 1222-006
PAGE 4 OF 6

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Reactor Vessel
ISO/DWG. NO. CPL-101 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 68 ° F

EXAM ITEM

CPL-101 Weld #2

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Shell to Flange Examined from Stud Hole #1 thru #17
See Previous ISI Data (9-29-90) for Limitations

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Shell to Flange Examined from Stud Hole #1 thru #17.
See Previous ISI Data (9-29-90), for Limitations

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 Tim Pelham LEVEL II DATE 10-13-93
2 David L Martin LEVEL II DATE 10/13/93

REVIEWERS:
1 Scott Lamm LEVEL III DATE 10-13-93
2 Richard D. Weber LEVEL N/A DATE 10/13/93
3 R.R. Wallace LEVEL ANII DATE 10/13/93

DATA SHEET NO. 1222-006
PAGE 5 OF 6

CPL-101C REV.0, Weld 2

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Kraut/Kramer USK-7
Serial No. 27276-3702
Sweep Length 8.45 Delay 9.00
Range 10
Gain (coarse) 20 L= / 20 L= dB
Gain (fine) 22 L= / 28 L= dB
Reference Sensitivity 42 / 48 dB
Remarks: N/A

SEARCH UNIT

Serial No. C09104
Size .5 x 1.0
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 59 °
Cable Type RG-58A/U
Cable Length 12'
Remarks: Exit Point .65" To Tip of Wedge

CALIBRATION BLOCK

No. CPL-47
"T" 8.0 Dia. Flat
Temperature 67 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 2.5
Remarks 25" Screen Range

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

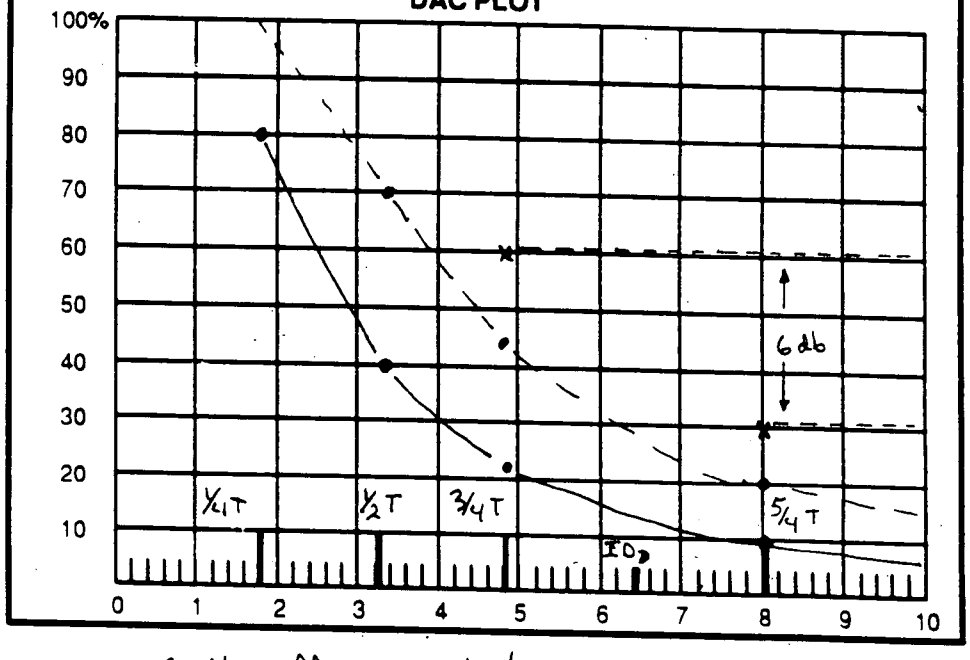
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	39
80	-12	19
40	-6	80
20	+12	81

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0810
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	0935

REMARKS: 6 db difference between 3/4T & 5/4T on clad side of block

N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/13/93
2 [signature] LEVEL II DATE 10-13-9

REVIEWERS 1 [signature] LEVEL III DATE 10-13-93
2 [signature] LEVEL N/A DATE 10/13/93
3 [signature] LEVEL AWII DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-006
PAGE 6 OF 6

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Reactor Head
ISO/DWG. NO CPL-101 REV. 0
THERMOMETER S/N MR 92-03
COMPONENT TEMP. 68 ° F

EXAM ITEM

CPL-101 Weld #2

SCAN 60 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Shell to Flange, Examined from Stud Hole #1 thru #17.
See Previous ISI Data, (9/29/90), for Limitations.

SCAN 60 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Shell to Flange, Examined from Stud Hole #1 thru #17.
See Previous ISI Data, (9/29/90), for Limitations.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

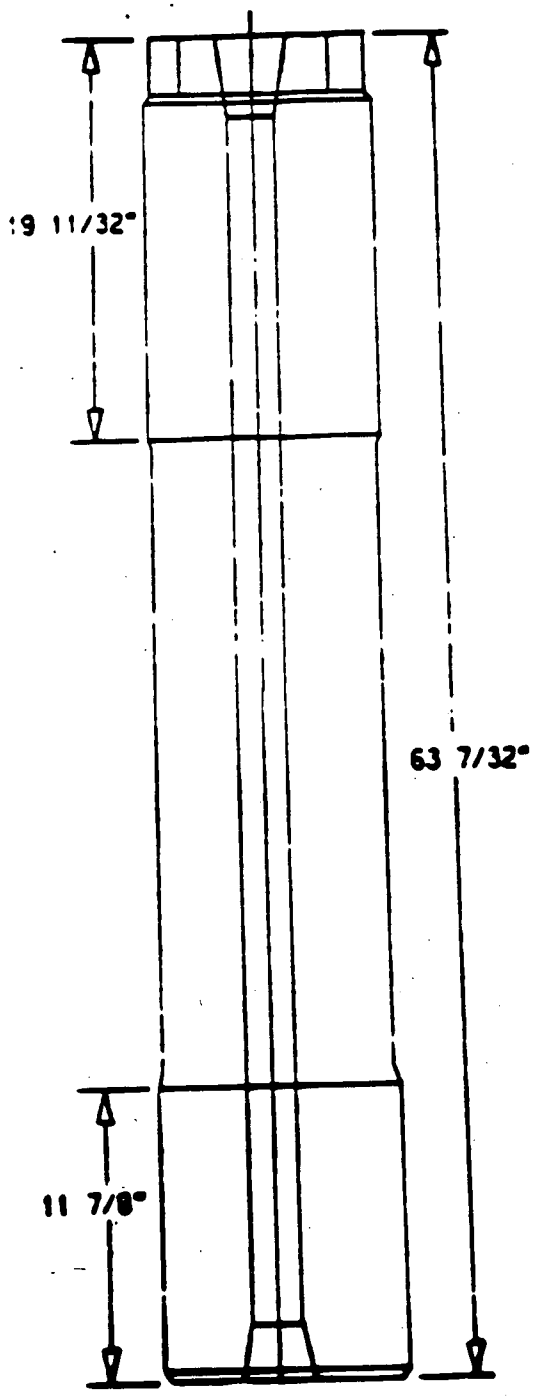
REMARKS:

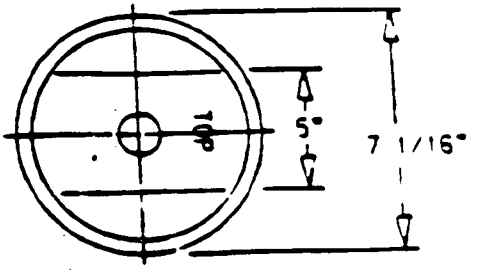
SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

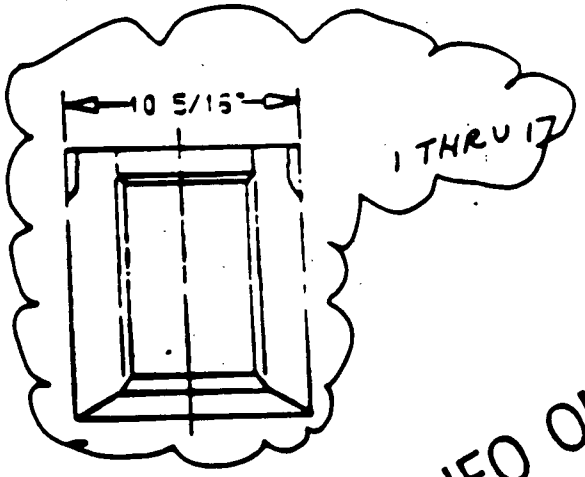
REMARKS:

EXAMINERS:
1 _____ LEVEL III DATE 10/13/93
2 R. Judd LEVEL II DATE 10/13/93

REVIEWERS:
1 _____ LEVEL III DATE 10-13-93
2 _____ LEVEL N/A DATE 10/13/93
3 _____ LEVEL ANII DATE 10/13/93

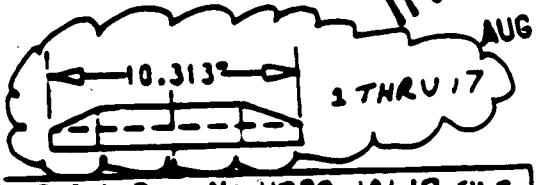






INFO ONL

AUG 2 5 1



CP & L Dwg. No. HBR2-10618 SH 3					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/81

CPL-101B REV 0

H.B. ROBINSON S.E. PLANT

UNIT NO. 2

DESCRIPTION R.V. STUDS, NUTS, & WASHERS

LINE NO. | CPL-101B REV. 0

DATA SHEET NO. 1218-007
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ___ INCHES
MATERIAL C/S
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED RV ISO/DWG/SK. # CPL-101B REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make Magnaflux
Type 8A
Batch No. 834067
Color Red

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make Parker Probe
Serial No. 88-012
AC [X] DC [N/A]
AMP Turns N/A
AMPS
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
RV Nuts #1 - 17	NRI	X	
	N/A		

EXAMINER Tim Oddom LEVEL II DATE 9-29-93
EXAMINER [signature] LEVEL II DATE 9-29-93
REVIEWER [signature] LEVEL III DATE 10-1-93
REVIEWER David B Weber DATE 10/2/93
REVIEWER ANII A Vallandara DATE 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-014
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: RPV	Component Name: REACTOR HEAD STUD WASHERS	Component ID No.: 101B WASHERS 1 thru 17
Class: ONE	Location/Isometric: CPL-101B / Rx. Bldg.	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 10X, NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
17 WASHERS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-29-93

Reviewing Examiner: [signature] Level: III Date: 9-30-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/2/93

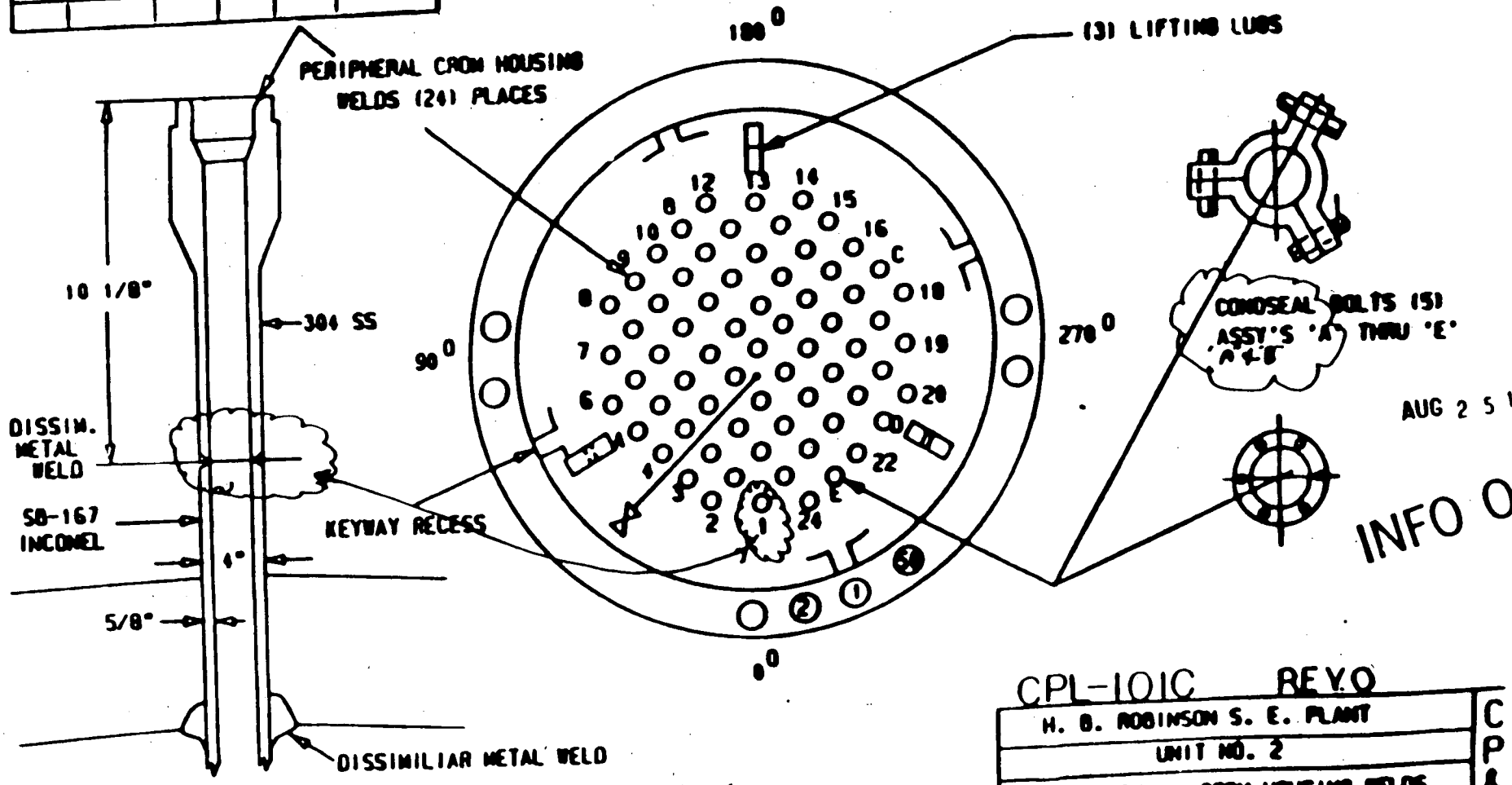
QA NDE ISI 6, Rev. 1, 07/93

ANII R Valladares 10/5/93

~~CP & L Dwg. No.~~ HBR2-10618 SH 4

CP & L P.O. No. CPL-51

DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPLL	CLO	CLO	12/11/89



AUG 2 5 1992

INFO ONLY

CPL-101C REV 0

H. B. ROBINSON S. E. PLANT	C
UNIT NO. 2	P
DESCRIPTION: CRDM HOUSING WELDS	&

DATA SHEET NO. 1217-060
THERMOMETER S/N SL 9103
TEMPERATURE 72 ° F
NOMINAL THICKNESS 8 INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED CRDM Housing ISO/DWG/SK. # 101C REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-S	93F03K	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-S	93F03K	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
CRDM #1	No recordable indications.	X	N/A

EXAMINER Scott Lam LEVEL III DATE 10-13-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Richard B. Weber LEVEL N/A DATE 10/14/93
REVIEWER A Valladares DATE AN/I 10/14/93
REVIEWER _____ DATE _____

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-018
Page 1 of 1

Project Job No. Unit 1☐ 2☐

System: RPV Conoseal's	Component Name: Conoseal	Component ID No.: Bolting Assembly A + B
Class: 1	Location/Isometric: CPL-101C	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: Flashlight, neutral gray card		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
Assembly A	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
Assembly B	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
					AU									
					A									

Comments/Notes: Bolts in place. Examined Assemblies A + B location as determined by ISO.

Examiner: Scott Lawson Level: III Date: 10-13-93

Examiner: N/A Level: N/A Date: N/A

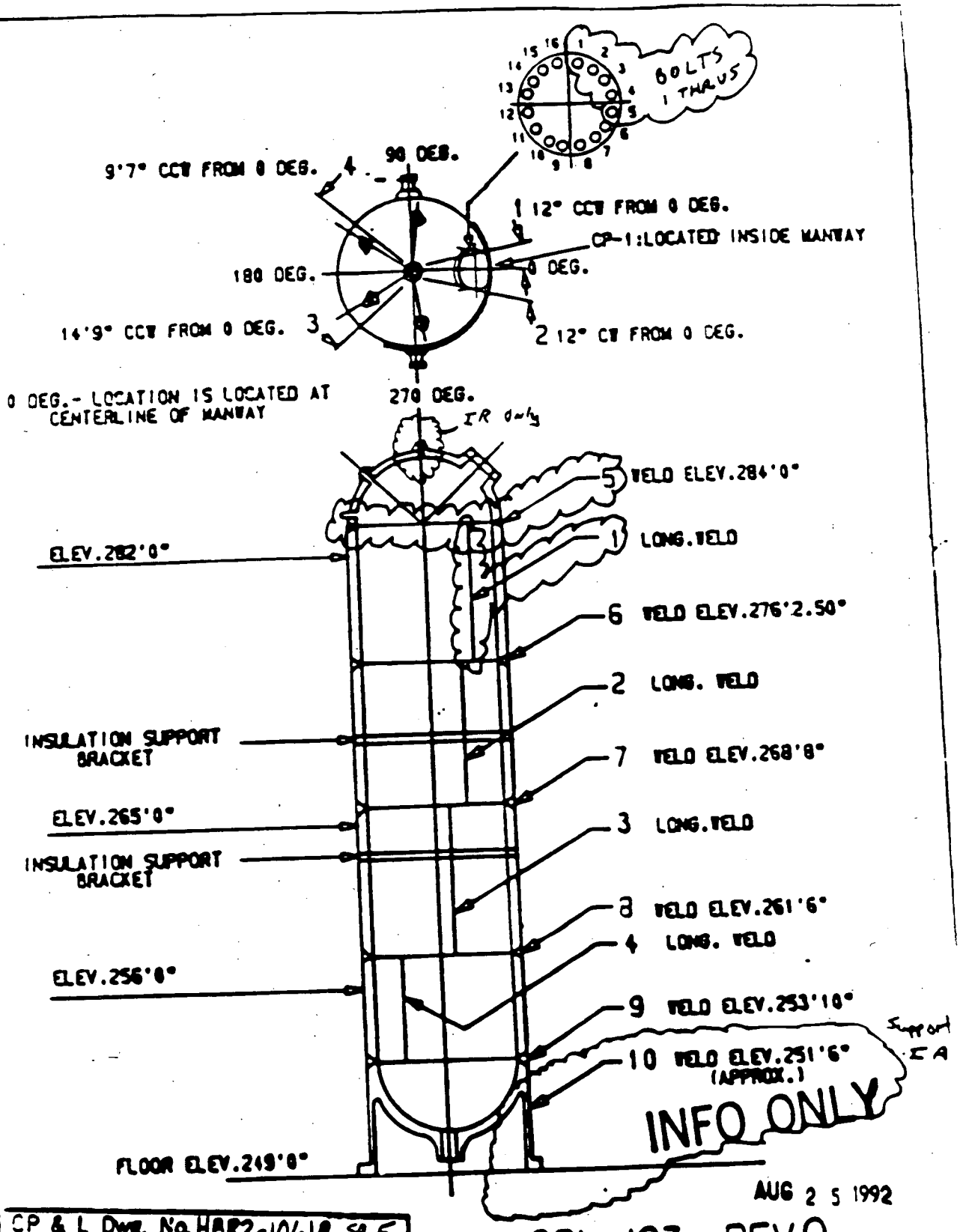
Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard A. Weber Date: 10/14/93

QA NDE ISI 6, Rev. 1, 07/93

ANII A. Valladares 10/14/93



AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 Sh 5					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RDW	CLL	CLO	CLO	12/11/89

CPL-103 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION PRESSURIZER	
LINE NO.	CPL-103 REV.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-017
Page 1 of 1

Project HBR Job No. PSI☐ ISI☒

System: PZR	Component Name: Support SKIRT	Component ID: 10
Drawing/Location: CPL-103R/0 / Bottom of Pressurizer - Rx. Bldg.		
☑ VT-3 Procedure: Sp. 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sapp Level: II Date: 9-30-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

Reviewed: Scott Larson LIII 9-30-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard A. Weber Date: 10/2/93

ANII C. Wallace 10-5-93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-015
Page 1 of 1

Project HBR Job No. Unit 1☐ 2☒

System: PRESSURIZER	Component Name: MANWAY	Component ID No.: MANWAY STUDS & NUTS
Class: 1	Location/Isometric: CPL-103	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ~~☐~~ N/A	Video Recording No: N/A
Equipment Used: FLASHLIGHT, NEUTRAL GRAY CARD, MIRROR		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
STUDS (1-5)	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
NUTS (1-5)		X		X		X		X		X		X	X	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

Examiner: Kenneth A. Hansen Level: II Date: 10-2-93

Reviewed Examiner: Scott Hansen Level: III Date: 10-4-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard O. Weber Date: 10/5/93

ANII A. Valladares 10/5/93

DATA SHEET NO. 1222-004
PAGE 1 OF 9

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

CPL-103 WELD #5 & LS1

INSTRUMENT

Model KRAUTKRAMER USK7
Serial No. 27276-3784
Sweep Length 6.42 Delay 8.02
Range 2.5
Gain (coarse) 0 dB
Gain (fine) 24 dB
Reference Sensitivity 24 dB
Remarks: N/A

SEARCH UNIT

Serial No. G09014
Size 1.0"
Frequency 2.25 MHz
Mode LONG.
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG58A/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-44
"T" 5.0" Dia. N/A
Temperature 65 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X]
Each Major Screen Div. = 0.625"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	21
3	80	40	8	30	16
4	70	35	9	20	10
5	60	30	10	10	6

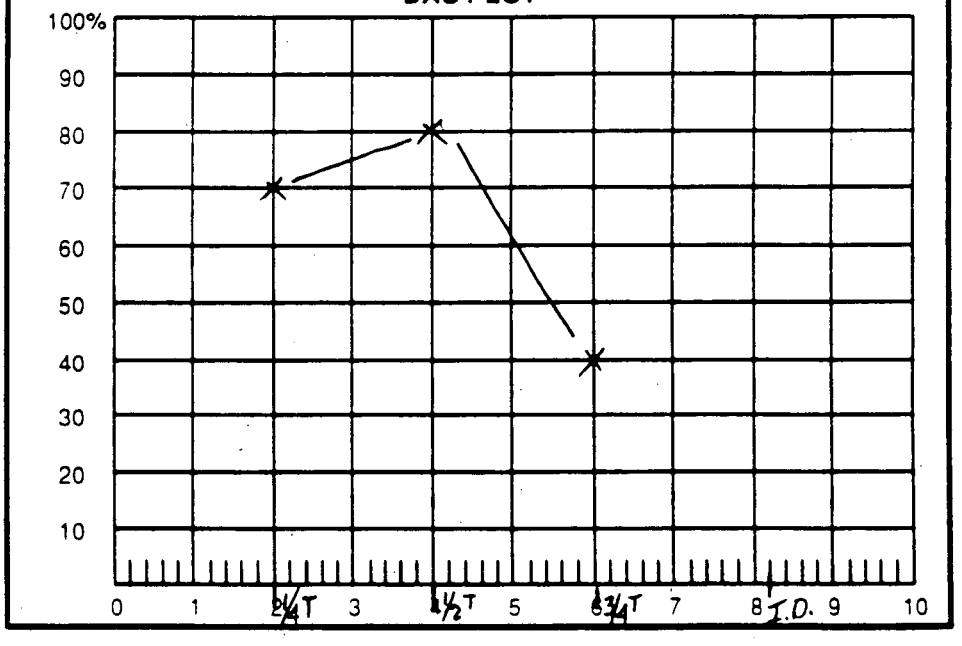
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	73

CAL. CHECKS

	TIME
INITIAL CAL.	0810
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1025

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10-7-93
2 [signature] LEVEL II DATE 10-7-93

REVIEWERS 1 [signature] LEVEL III DATE 10/11/93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1222-004
PAGE 2 OF 9
EXAM ITEM

103 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM PZR
ISO/DWG. NO. 103 REV. 0
THERMOMETER S/N JL91-03
COMPONENT TEMP. 80 °F

SCAN 0 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
☒	N/A	N/A	N/A	N/A	☒	N/A	☒	N/A	☒	☒	N/A

REMARKS: Scan obstructed by weld pads see previous ISI data, dated 2-7-86 for limitations

SCAN ___ ° SCAN dB ___				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
							N/A				

REMARKS:

SCAN ___ ° SCAN dB ___				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
							N/A				

REMARKS:

SCAN ___ ° SCAN dB ___				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
							N/A				

REMARKS:

EXAMINERS:
1 LEVEL III DATE 10-7-93
2 LEVEL II DATE 10-7-93

REVIEWERS:
1 LEVEL III DATE 10/11/93
2 LEVEL N/A DATE 10/11/93
3 LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1222-004
PAGE 3 OF 9
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM PZR
ISO/DWG. NO. 103 REV. 0
THERMOMETER S/N JL91-03
COMPONENT TEMP. 80 °F

103 1 Long Seam

SCAN 0 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	NA	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A
REMARKS: Examined 1 foot of long seam.											

SCAN ___ ° SCAN dB ___				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
REMARKS:											

SCAN ___ ° SCAN dB ___				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
REMARKS:											

SCAN ___ ° SCAN dB ___				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
REMARKS:											

EXAMINERS:
1 LEVEL III DATE 10-7-93
2 LEVEL II DATE 10-7-93

REVIEWERS:
1 LEVEL III DATE 10/11/93
2 B. Weber LEVEL N/A DATE 10/11/93
3 RBValladares LEVEL ANII DATE 10/11/93

NES 9/90 – REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-004
PAGE 4 OF 9

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

PL-103 REV.0, Welds 5 & LS-1

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-807
Sweep Length 9.56 Delay 7.77
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 12 dB
Reference Sensitivity 32 dB
Remarks: N/A

SEARCH UNIT

Serial No. G10188
Size .5 x 1.0
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-58A/U
Cable Length 12'
Remarks: Exit Point .75" To Tip of Wedge

CALIBRATION BLOCK

No. CPL-44
"T" 5.0 Dia. N/A
Temperature 65 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1
Remarks 10" Screen Range
N/A

COUPLANT

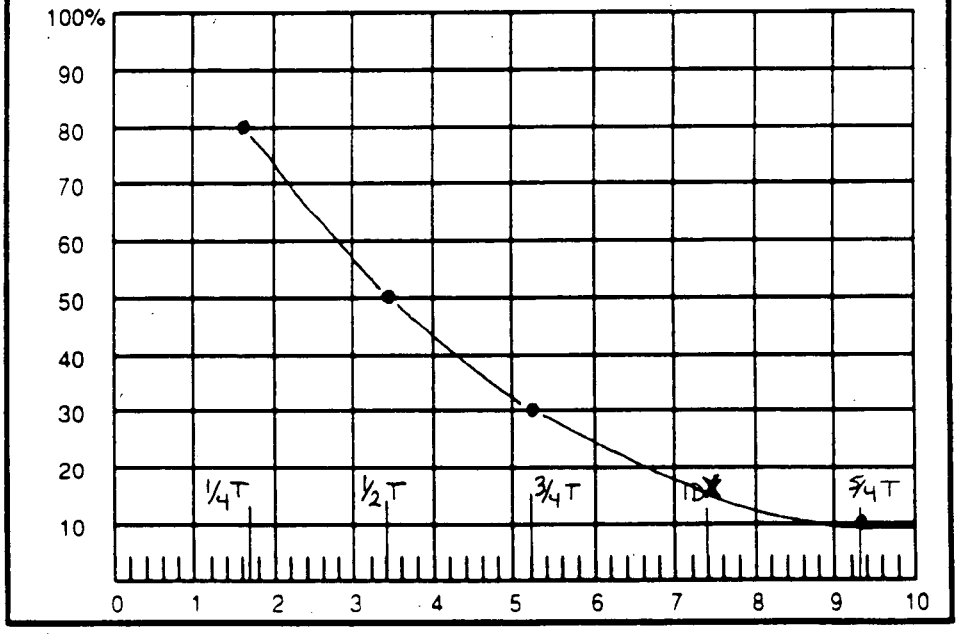
Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	79

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0840
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1026

REMARKS: 10 db difference between 3/4 T and 5/4 T on Clad side of the calibration block.
N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/7/93
2 [signature] LEVEL II DATE 10-7-93
REVIEWERS 1 [signature] LEVEL [illegible] DATE 10-7-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1222-004
PAGE 5 OF 9

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Pressurizer
ISO/DWG. NO. CPL-103 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM

Weld No. 5

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Scan obstructed by weld pads, see previous ISI data, dated 2-7-86 for limitations

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

EXAMINERS:
1 [signature] LEVEL III DATE 10/7/93
2 C B D. Jude LEVEL II DATE 10-7-93

REVIEWERS:
1 Scott Lum LEVEL III DATE 10-7-93
2 Richard B. Wilson LEVEL N/A DATE 10/11/93
3 R P Wallace LEVEL ~~A~~ II DATE 10/11/93

DATA SHEET NO. 1222-004
PAGE 6 OF 9

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Pressurizer
ISO/DWG. NO. CPL-103 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM

Long Weld 1 1'Ft. of

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N/A

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/7/93
2 R P. Judd LEVEL II DATE 10-7-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-7-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-004
PAGE 7 OF 9

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

CPL-103 WELD #5

INSTRUMENT

Model USN-7
Serial No. 27276-749
Sweep Length 8.32 Delay 7.20
Range 10"
Gain (coarse) +20 / = 20 dB
Gain (fine) +22 / = 22 dB
Reference Sensitivity +42 / = 42 dB
Remarks: N/A

SEARCH UNIT

Serial No. C09104
Size .5" x 1.0"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type BNC/BNC
Cable Length (2) 6'
Remarks: EXIT POINT TO FRONT OF WEDGE = .75"
N/A

CALIBRATION BLOCK

No. CPL-44
"T" 5.0" Dia. N/A
Temperature 68 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = 1.5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

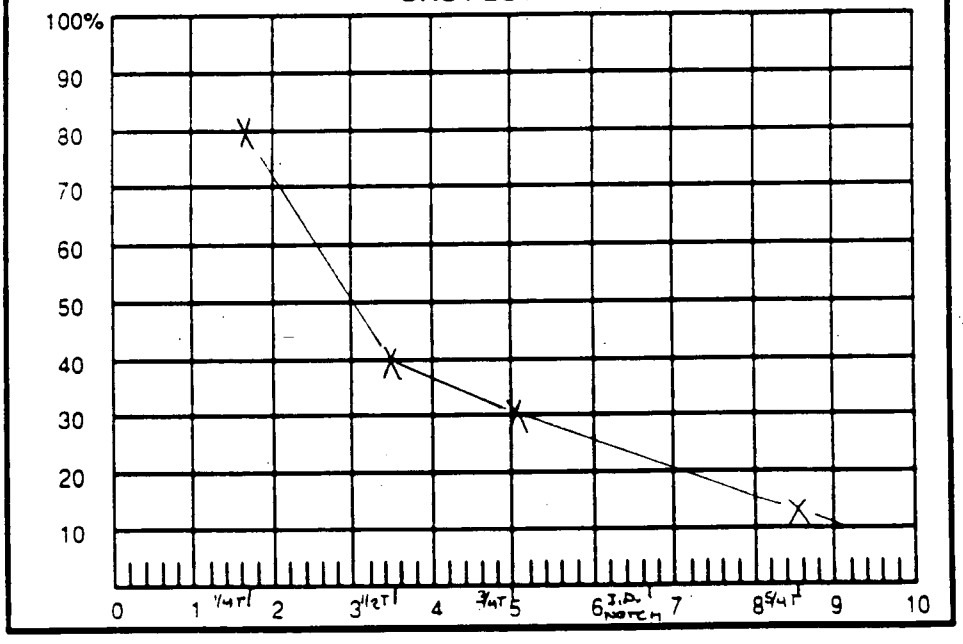
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	79

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0921
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1150

DAC PLOT



REMARKS: X = S.O.H

EXAMINERS 1 David W Martin LEVEL II DATE 10/7/93
2 Tim Osborn LEVEL II DATE 10/7/93

REVIEWERS 1 Scott Lenz LEVEL III DATE 10-7-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 R C Wallace LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1222-004
PAGE 8 OF 9

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #5 / P212
ISO/DWG. NO. CPL-103 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 °F

EXAM ITEM
CPL-103 WELD # 5

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: EXAM OBSTRUCTED BY WELD PADS. SEE PREVIOUS I.S.I DATA DATED 2-7-86 FOR LIMITATIONS

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: EXAM OBSTRUCTED BY WELD PADS. SEE PREVIOUS I.S.I DATA DATED 2-7-86 FOR LIMITATIONS.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Daniel J Monteleone LEVEL III DATE 10/7/93
2 Tim Caldwell LEVEL II DATE 10/7/93

REVIEWERS:
1 Scott Long LEVEL III DATE 10-7-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 RC Valladares LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1222-004
PAGE 9 OF 9

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #1 / PZR.
ISO/DWG. NO. CPL-103 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 ° F

EXAM ITEM
CPL-103 WELD #1 (LONG SEAM)

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: EXAMINED 1' OF LONG SEAM

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: EXAMINED 1' OF LONG SEAM.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 David M Martin LEVEL II DATE 10/7/93
2 Tim Addison LEVEL II DATE 10/7/93

REVIEWERS:
1 [signature] LEVEL Lev III DATE 10-7-93
2 Richard B Weber LEVEL N/A DATE 10/11/93
3 R Balladares LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1239-001
PAGE 1 OF 3
CPL-103. REV. 0, Spray Nozzel IR

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1239
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-807
Sweep Length 7.82 Delay 8.67
Range 10
Gain (coarse) 60 dB
Gain (fine) 20 dB
Reference Sensitivity 80 :3
Remarks: N/A

SEARCH UNIT

Serial No. G10188
Size .5 x 1.0
Frequency 2.25 MHz
Mode Shear
Nom. Angle 70 °
Measured Angle 70 °
Cable Type RG-58A/U
Cable Length 12'
Remarks: Exit Point 1" From Tip of Wedge
N/A

CALIBRATION BLOCK

No. UT-8
"T" 5.7 Dia. N/A
Temperature 69 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. N/A
Metal Path X Depth N/A
Each Major Screen Div. = 2.0
Remarks 20" Screen
Inner Radius Exam
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

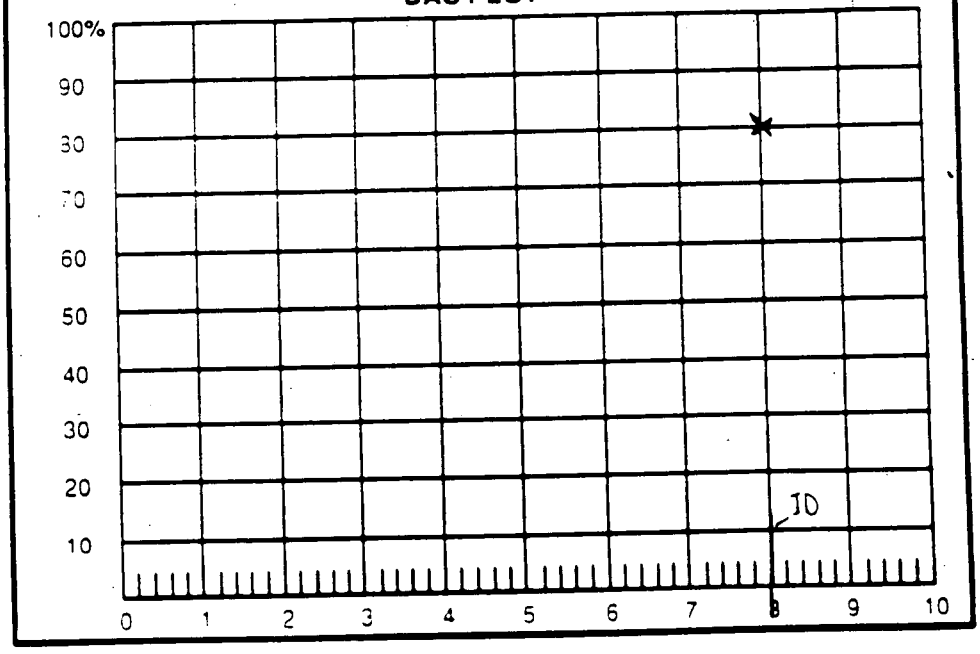
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	78
20	+12	79

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1345
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1540

DAC PLOT



REMARKS: N/A

EXAMINERS 1 _____ LEVEL III DATE 10/7/93
2 _____ LEVEL II DATE 10-7-93
REVIEWERS 1 _____ LEVEL III DATE 10-7-93
2 _____ LEVEL N/A DATE 10/11/93
3 _____ LEVEL ANII DATE 10/11/93

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1234-001
PAGE 2 OF 3
EXAM ITEM: Spray Nozzel IR

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Pressurizer
ISO/DWG. NO. CPL-103 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 81 °F

SCAN 70 ° SCAN dB 86				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	IR	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	IR	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: See attached sketch for scan obstructions

N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

EXAMINERS:
1 LEVEL III DATE 10/7/93
2 LEVEL II DATE 10-7-93

REVIEWERS:
1 LEVEL III DATE 10-7-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 LEVEL DATE

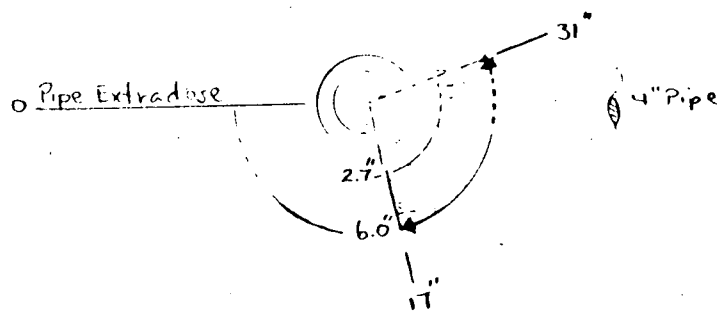
NES NUCLEAR ENERGY SERVICES, INC.

NES 9/90 - REV. 1

CPL-103 REV. 0
Spray Nozzel IR

1234-001
3 of 3

Pressurizer
LHG DN
Transducer Contact
Scan Limitations
Due to Raised Lettering

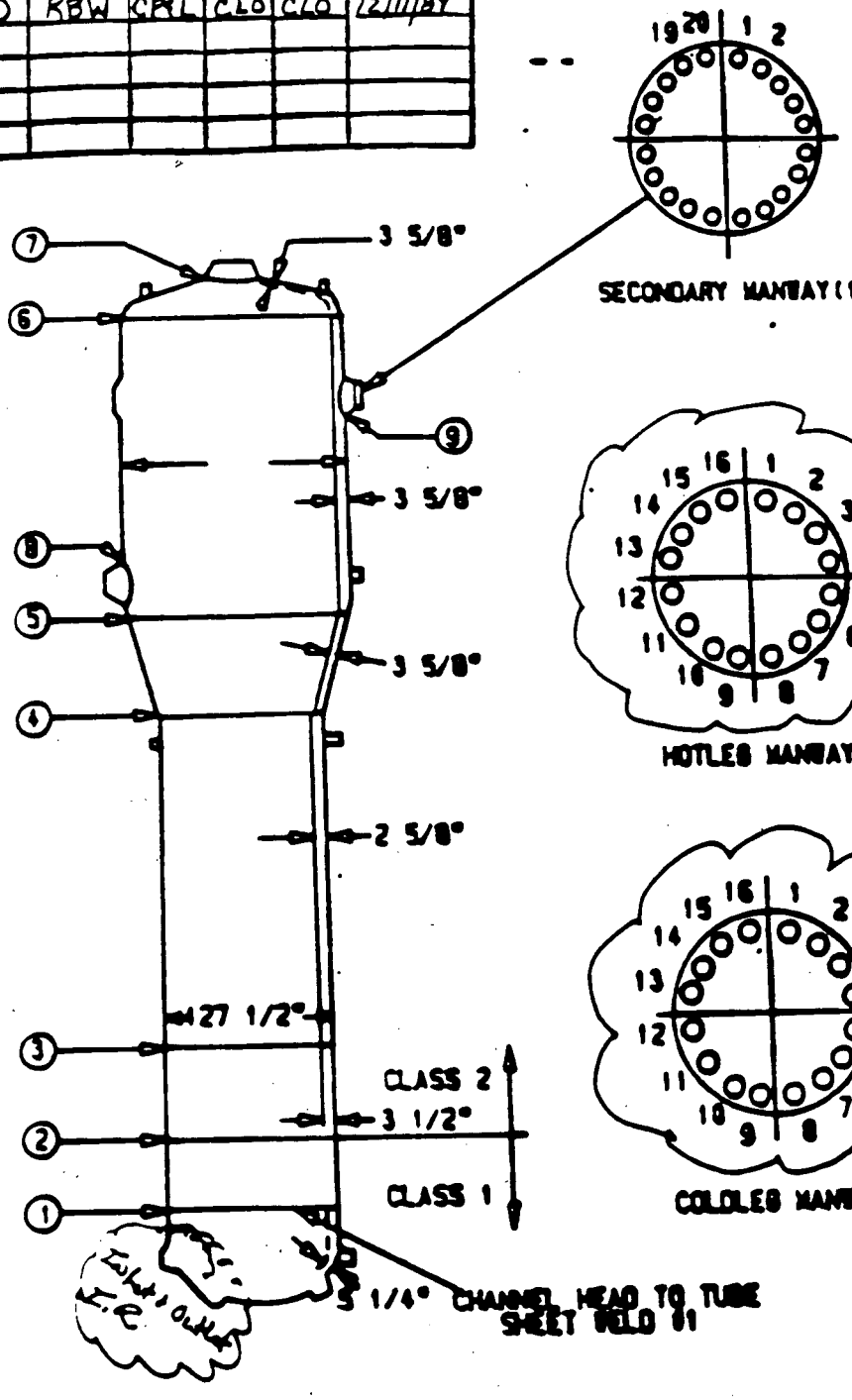


- Scan Limitation Area

Examiner: [signature] Level: III Date: 10/7/93

Examiner: [signature] Level: II Date: 10-7-93

DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/89



AUG 2 5 1992

INFO ONLY

NOTES:

1. CLASS 2 PORTION WAS CPL-201

CPL-105 REV 0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION STEAM GENERATOR A	
LINE NO.	CPL-105 RE

I certify that the image contained on this frame was ma in the normal and regular course of business on the date stated below and that it is an accurate reproduction of

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-054
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: St. Gen A	Component Name: Steam Gen A	Component ID: outlet Inlet 1R
Drawing/Location: CPL 105		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: N/A ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	✓	
Mechanical interference	N/A	✓	
Cracks	N/A	✓	
Missing attachment/hardware	N/A	✓	
Loose/missing parts	N/A	✓	
Abnormal wear	N/A	✓	
Abnormal corrosion	N/A	✓	
Abnormal gouges	N/A	✓	
Arc Strikes on sliding support	N/A	N/A	
Misalignment of the support	N/A	N/A	
Variable/Constant Support	Actual: N/A		
Snubber N/A	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Scott Langan Level: III Date: 10-5-93

Examiner: [signature] Level: II Date: 10/5/93

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/7/93

QA NDE ISI 11, Rev. 3, 07/93

AN11 R Palladares 10-7-93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 1 of 10

Project HBR Job No. Unit 1 ☒ 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL - 105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usa
070 A H1	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
036 A H2														
055 A H3														
035 A H4														
068 A H5														
022 A H6														
045 A H7														
004 A H8														
044 A H9														
029 A H10														
006 A H12	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

All to be installed on S.G. "A" Hot leg

Examiner: Kenneth D. Lane Level: II Date: 9-21-93

~~Reviewer~~ Examiner: Scott Larson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard A. Weber Date: 10/2/93

AN II R Helladen 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 2 of 10

Project HBR Job No. Unit 1 N/A 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
023 AH14 **	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
016 AH15 **														
025 ~~023~~ AH16 ** (KW 9/21/93)														
061 AC1 *														
034 AC2 *														
054 AC3 *														
001 AC4 *														
053 AC5 *														
064 AC6 *														
073 AC7 *														
026 AC9 *	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

* To be installed on S.G. "A" cold leg ** To be installed on S.G. "A" hot leg

Examiner: Kenneth B. Mann Level: II Date: 9/21/93

~~Examiner~~ Reviewer: Scott Lowe Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/3/93

QA NDE ISI 6, Rev. 1, 07/93

ANH Walladao 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 3 of 10

Project HBR Job No. Unit 1 N/A 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL - 105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
007 AC 3*	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
026 AC 09*														
057 AC 10*														
071 AC 11*														
040 AC 12*														
065 AC 13*														
021 AC 14*														
041 AC 15*														
060 AC 16*														
332														
169**	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

*To be installed on S.G. "A" cold leg **To be installed on S.G. "A" hot leg

Examiner: Kenneth A. Slama Level: II Date: 9/21/93

~~Reviewer~~ Examiner: Scott Larson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard A. Weber Date: 10/2/93

ANH Calladara 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 4 of 10

Project HBR Job No. Unit 1 N/A 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
052 B H1	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
030 B H2		↓		↓		↓		↓		↓		↓	↓	
002 B H3		↓		↓		↓		↓		↓		↓	↓	
013 B H6		↓		↓		↓		↓		↓		↓	↓	
056 B H7		↓		↓		↓		↓		↓		↓	↓	
048 B H8		↓		↓		↓		↓		↓		↓	↓	
~~008~~ KEN 9/21/93		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
008 B H9		X		X		X		X		X		X	X	
059 B H10		↓		↓		↓		↓		↓		↓	↓	
046 B H11		↓		↓		↓		↓		↓		↓	↓	
017 B H12	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: Kenneth A. Lane Level: II Date: 9/21/93

~~Reviewer Examiner~~: Scott Larson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/5/93

ANH A. Palladino 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 5 of 10

Project HBR Job No. Unit 1 N/A 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
072 BH 13	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
010 BH 14														
074 BH 15														
209 BH 16														
027 BC 1														
069 BC 2														
028 BC 3														
039 BC 4														
019 BC 5														
009 BC 6														
062 BC 7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: [signature] Level: II Date: 9/21/93

Reviewer Examiner: [signature] Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

ANH [signature] 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 6 of 10

Project HBR Job No. Unit 1 N/A 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
058 BC 8	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
043 BC 9	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
032 BC 10	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
014 BC 11	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
037 BC 12	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
020 BC 13	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
050 BC 14	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
049 BC 15	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
047 BC 16	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
197	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
329	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: Kenneth L. Hamm Level: II Date: 9/21/93

~~Reviewer~~ Examiner: Scott Larson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/3/93

QA NDE ISI 6, Rev. 1, 07/93

ANA R. Valladares 10/3/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 7 of 10

Project HBR Job No. Unit 1 ☒ 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
110 CH 1	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
106 CH 2														
115 CH 3														
121 CH 4														
103 CH 5														
089 CH 6														
109 CH 7														
087 CH 8														
127 CH 9														
088 CH 10														
076 CH 11	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: Kenneth R. Hamm Level: II Date: 9/21/93

~~Reviewer~~ Examiner: Scott Lamm Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard D. Weber Date: 10/2/93

ANII Reviewer 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 8 of 10

Project HBR Job No. Unit 1 [ ] 2 [X]

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 [X]
Replication Yes [N/A] No [X]	Direct [X] Remote [N/A]	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
126 CH 12	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
086 CH 13														
112 CH 14														
114 CH 15														
094 CH 16														
082 CC 1														
093 CC 2														
104 CC 3														
122 CC 4														
085 CC 5														
118 CC 6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: Kenneth R. Hance Level: II Date: 9/21/93

Reviewer Examiner: Scott Larson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
[X] Pass (EER, EWR, Etc. - If Applicable)
[ ] Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Wallace 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
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Project HBR Job No. Unit 1 ☐ 2 ☒

System: STEAM GENERATOR	Component Name: SG MANWAY COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL-105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
077CC 7	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
080 CC 8														
116 CC 9														
090 CC 10														
111 CC 11														
092 CC 12														
084 CC 14														
081 CC 15														
125 CC 16														
191														
323	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: [signature] Level: II Date: 9/21/93

Reviewer: Scott [signature] Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

[signature] 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 10 of 10

Project HBR Job No. Unit 1 2 ☒

System: STEAM GENERATOR	Component Name: COVER STUDS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: CPL - ~~+50~~ IRN 9/22/93 105	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
327	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
333														
178														
184														
328		↓		↓		↓		↓		↓		↓	↓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
	↓		↓		↓		↓		↓		↓			
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:

Examiner: Kenneth L. Hance Level: II Date: 9/21/93

~~Reviewer~~ Examiner: Scott Larson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard D. Weber Date: 10/5/93

QA NDE ISI 6, Rev. 1, 07/93
AN/I Rabbadeau 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 1 of 1

Project HBR Job No. N/A Unit 1☐ 2☒

System: STEAM GENERATOR	Component Name: RSG MANWAY COVER NUTS (REV 9/16/93)	Component ID No.: See below
Class: 1	Location/Isometric: New Parts Iso not yet determined.	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
454	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
479														
493														
526														
535														
540														
560														
573														
592														
471														
N/A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.

Examiner: Kenneth R. Lance Level: II Date: 9/16/93

~~Review Examiner~~: Scott Lance Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard L Weber Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Wallace 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 1 of 9

Project HBR Job No. N/A Unit 1☐ 2☒

System: STEAM GENERATOR	Component Name: NEW SG MANWAY COVER NUTS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: NEW PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
335	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
301														
332														
312														
311														
305														
291 *														
325														
331														
334														
327	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES ~~OBE~~ CCN 9/11/93 OBSERVED.
* To be installed on S.G "A" cold leg manway

Examiner: Kenneth A. Lane Level: II Date: 9/11/93

~~Reviewer~~ Examiner: Scott Larsen Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard O. Weber Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

ANII A Valladares 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers
Job No. N/A Unit 1 ☒ 2 ☒

Report No. _____
Page 2 of 3

Project HBR

System: STEAM GENERATOR	Component Name: 9/16/93 RSG MANWAY COVER NUTS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: NEW PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
307	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
304														
293														
299														
297														
329														
333														
300														
309														
302														
292 *	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.
* To be installed on S.G. "A" cold leg manway

Examiner: Kenneth L. Mann Level: II Date: 9/11/93

~~Reviewer~~ Examiner: Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard L. Weber Date: 10/2/93

AWH RWalladares 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 3 of 9

Project HBR Job No. N/A Unit 1 ☒ 2 ☒

System: STEAM GENERATOR	Component Name: 9/15/93 ~~RSG~~ MANWAY COVER NUTS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
326	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
296														
323														
294														
303														
306														
313														
324														
308														
322														
482	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.

Examiner: Kenneth A. Mann Level: II Date: 9/11/93

~~Reviewer~~ Examiner: [signature] Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☒ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

ANH Arballadares 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 4 of 9

Project HBR Job No. N/A Unit 1 ~~☒~~ 2 ☒

System: STEAM GENERATOR	Component Name: (REN 9-16-93) ~~RSG~~ MANWAY COVER NUTS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
449	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
499														
590														
478														
497														
460														
528														
579														
465														
577														
490	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.

Examiner: Kenneth L. Hance Level: II Date: 9/11/93

~~Reviewer Examiner~~: [signature] Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/2/93

ANII [signature] 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers
Job No. N/A Unit 1 ☒ 2 ☒

Report No. _____
Page 5 of 9

Project HBR

System: STEAM GENERATOR	Component Name: ~~3-4-3~~ RSG MANWAY COVER NUTS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
453	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
520														
492														
548														
532														
522														
469														
597														
525														
607														
484	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE ~~FINISH~~ ERN 9/11/93 FINISHING AND SCRATCHES OBSERVED.

Examiner: Kenneth R. Hamm Level: II Date: 9/11/93

~~Reviewer~~ Examiner: Scott Lawson Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/2/93

ANII A Balladares 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 6 of 9

Project: HBR Job No. Unit 1 N/A 2 ☒

System: STEAM GEN. ~~GEN~~ KAN 9/14/93	Component Name: ~~RSG~~ KAN 9-16-93 SG MANWAY COVER NUTS	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0	Method: VT-1 ☒	
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
566	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
455	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
481	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
572	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
476	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
536	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
589	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
475	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
495	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
090 *	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
106 *	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.
*To be installed on S.G "A" cold leg

Examiner: Kenneth A. Blaine Level: II Date: 9/11/93

~~Reviewer Examiner~~: Scott Lane Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard A. Valladares Date: 10/2/93

ANM R Valladares 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 7 of 9

Project HBR Job No. N/A Unit 1 ☒ 2 ☒

System: STM GEN.	Component Name: RSG MANWAY COVER NUTS (new 9-10-93)	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
019**	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
021**														
126*														
071*														
053**														
078*														
049**														
080*														
046**														
112*														
013**	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.
*To be installed on S.G. "A" cold leg **To be installed on S.G. "B" Hot leg

Examiner: Kenneth R. Hamm Level: II Date: 9/11/93

Reviewer: Scott Hamm Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Wilson Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

AWA RP Wallace 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 8 of 9

Project: HBR Job No. Unit 1 ☒ 2 ☒

System: STM GEN	Component Name: ~~RSG~~ MANWAY COVER NUTS (KAH 6-16-93)	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
122*	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
097**														
113*														
059**														
026**														
003**														
035**														
065*														
034**														
120*														
041**	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.
*To be installed on S.G. "A" cold leg manway **To be installed on S.G. "A" Hot leg

Examiner: [signature] Level: II Date: 9/11/93

Reviewer: [signature] Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/2/93

ANII [signature] 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page 9 of 9

Project HBR Job No. Unit 1 N/A 2 ☒

System: STM GEN	Component Name: RSG MANWAY COVER NUTS (REV 9-16-93)	Component ID No.: SEE BELOW
Class: 1	Location/Isometric: PARTS ISO. NOT YET DETERMINED	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐ N/A	Video Recording No: N/A
Equipment Used: NUETRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
015**	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
044**														
008**														
068														
100*														
110*														
038**														
N/A														
		N		A		N		A		N		A	N	A

Comments/Notes: NO INDICATIONS NOTED, HOWEVER NUMEROUS MACHINE MARKS, POOR SURFACE FINISHING AND SCRATCHES OBSERVED.
*To be installed on S.G."A" cold leg **To be installed on S.G."A" Hot leg

Examiner: Kenneth A Hance Level: II Date: 9/11/93

~~Reviewer~~ Examiner: Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: _____ Date: 10/2/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Wallace 10/5/93

DATA SHEET NO. _____
THERMOMETER S/N MR 92 04
TEMPERATURE* 60/120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 1 OF 8

SYSTEM EXAMINED UNIT 2 STEAM GENERATOR ISO/DWG/SK. # PARTS-ISO. NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry N/A Wet X
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke N/A Coil N/A Prod N/A
Make MAGNAFLUX P1500
Serial No. SR 86165
AC N/A DC X
AMP Turns N/A
AMPS 750/1400
Pole Spacing N/A
Yoke Lift Test
Yes N/A No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
454 (SG NUT)	NO RECORDABLE INDICATIONS NOTED	X	N/A
479 " "	" " " "		
493 " "	" " " "		
526 " "	" " " "		
535 " "	" " " "		
540 " "	" " " "		
560 " "	" " " "		
573 " "	" " " "		
592 " "	" " " "		
335 " "	" " " "		
307 " "	" " " "		
332 " "	" " " "		
311 " "	" " " "		
305 " "	" " " "		

EXAMINER [signature] LEVEL II DATE 9/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER [signature] DATE 10/2/93
REVIEWER [signature] DATE 10/5/93

DATA SHEET NO. _____
THERMOMETER S/N MR 9204
TEMPERATURE* 120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 1 OF 8

SYSTEM EXAMINED UNIT 2 STEAM GENERATOR ISO/DWG/SK. # ISO. PARTS, NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry N/A Wet X
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke N/A Coil N/A Prod N/A
Make MAGNAFLUX P1500
Serial No. ~~SR 86165~~ 2W SR 86165
AC N/A DC X
AMP Turns N/A
AMPS 750/1400
Pole Spacing N/A
Yoke Lift Test
Yes N/A No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
* 291 (SG NUT)	NO RECORDABLE INDICATIONS NOTED	X	N/A
325 " "	" " " "		
331 " "	" " " "		
334 " "	" " " "		
327 " "	" " " "		
304 " "	" " " "		
293 " "	" " " "		
299 " "	" " " "		
297 " "	" " " "		
329 " "	" " " "		
333 " "	" " " "		
309 " "	" " " "		
302 " "	" " " "		
* 292 " "	" " " "		

EXAMINER [signature] LEVEL II DATE 9/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER [signature] DATE 10/5/93

* To be installed on S.G. "A" cold leg

DATA SHEET NO. _____
THERMOMETER S/N HR 9204
TEMPERATURE* 2120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 3 OF 8

SYSTEM EXAMINED STEAM GENERATOR UNIT 2 ISO/DWG/SK. # PARTS ISO. NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry N/A Wet X
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke N/A Coil N/A Prod N/A
Make MAGNAFLUX P1500
Serial No. ~~KEN~~ SR 86165
AC N/A DC X
AMP Turns N/A
AMPS 750/1400
Pole Spacing N/A
Yoke Lift Test
Yes N/A No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
326 (SG NUT)	NO RECORDABLE INDICATIONS NOTED	X	N/A
296 " "	" " " "		
323 " "	" " " "		
303 " "	" " " "		
306 " "	" " " "		
313 " "	" " " "		
324 " "	" " " "		
308 " "	" " " "		
322 " "	" " " "		
482 " "	" " " "		
449 " "	" " " "		
499 " "	" " " "		
590 " "	" " " "		
478 " "	" " " "		

EXAMINER Kenneth A. Hasse LEVEL II DATE 9/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Hasse LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Anil A. Palladares DATE 10/5/93

DATA SHEET NO. _____
THERMOMETER S/N MR 92 04
TEMPERATURE* 62 120 °F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1
UNIT 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 4 OF 8

SYSTEM EXAMINED STEAM GENERATOR ISO/DWG/SK. # PART ISO. NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry N/A Wet X
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke N/A Coil N/A Prod N/A
Make MAGNAFLUX P1500
Serial No. ~~SR~~ 86165
AC N/A DC X
AMP Turns N/A
AMPS 750/1400
Pole Spacing N/A
Yoke Lift Test
Yes N/A No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
497 (SG NUT)	NO RECORDABLE INDICATIONS NOTED	X	N/A
460 " "	" " " "		
528 " "	" " " "		
579 " "	" " " "		
465 " "	" " " "		
577 " "	" " " "		
490 " "	" " " "		
453 " "	" " " "		
520 " "	" " " "		
492 " "	" " " "		
548 " "	" " " "		
532 " "	" " " "		
522 " "	" " " "		
469 " "	" " " "		

EXAMINER Leonard A. Hanson LEVEL II DATE 2/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Tanner LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Anil R. Mehta-Davies DATE 10/3/93

DATA SHEET NO. _____
THERMOMETER S/N MR92 04
TEMPERATURE* 120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1
UNIT 2
SYSTEM EXAMINED STEAM GENERATOR

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 5 OF 8

ISO/DWG/SK. # PARTS ISO. NOT YET DETERMINED
REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry N/A Wet X N/A 9/10/93
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke N/A Coil N/A Prod N/A
Make MAGNAFLUX P1500
Serial No. SR 86165
AC N/A DC X
AMP Turns N/A
AMPS 750/1400
Pole Spacing N/A
Yoke Lift Test
Yes N/A No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
597 (SG NUT)	NO RECORDABLE INDICATION NOTED	X	N/A
525 " "	" " " "		
607 " "	" " " "		
484 " "	" " " "		
566 " "	" " " "		
481 " "	" " " "		
572 " "	" " " "		
476 " "	" " " "		
536 " "	" " " "		
589 " "	" " " "		
475 " "	" " " "		
495 " "	" " " "		
* 090 " "	" " " "		
* 106 " "	" " " "		

EXAMINER [signature] LEVEL II DATE 2/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER [signature] DATE 10/2/93
REVIEWER [signature] DATE 10/5/93

*To be installed on S.G. "A" cold leg

DATA SHEET NO. _____
THERMOMETER S/N MR 9204
TEMPERATURE* 120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 6 OF 8

SYSTEM EXAMINED UNIT 2 STEAM GENERATOR ISO/DWG/SK. # PARTS ISO. NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry [N/A] Wet [X]
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke [N/A] Coil [N/A] Prod [N/A]
Make MAGNAFLUX P1500
Serial No. ~~SR-86165~~ 9/23/93
AC [N/A] DC [X]
AMP Turns N/A
AMPS 750 / 1400
Pole Spacing N/A
Yoke Lift Test
Yes [N/A] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
** 019 (SG NUT)	NO RECORDABLE INDICATION NOTED	X	N/A
** 021 " "	" " " "		
* 126 " "	" " " "		
* 071 " "	" " " "		
** 053 " "	" " " "		
* 078 " "	" " " "		
** 049 " "	" " " "		
* 080 " "	" " " "		
** 046 " "	" " " "		
* 112 " "	" " " "		
** 013 " "	" " " "		
* 122 " "	" " " "		
* 097 " "	" " " "		
* 113 " "	" " " "		

EXAMINER Kenneth A. Stone LEVEL II DATE 9/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Ramsey LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER ANII R. Walladares DATE 10/5/93

* To be installed on S.G. "A" cold leg
** To be installed on S.G. "A" hot leg

DATA SHEET NO. _____
THERMOMETER S/N MR92 04
TEMPERATURE* 120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 7 OF 8

SYSTEM EXAMINED UNIT 2 STEAM GENERATOR ISO/DWG/SK. # PARTS ISO. NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry [N/A] Wet [X]
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

EQUIPMENT

Yoke [N/A] Coil [N/A] Prod [N/A]
Make MAGNAFLUX P1500
Serial No. ~~SR 86165~~ 4/22/93
AC [N/A] DC [X]
AMP Turns N/A
AMPS 750 / 1400
Pole Spacing N/A
Yoke Lift Test
Yes [N/A] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
**059 (SG NUT)	NO RECORDABLE INDICATIONS NOTED	X	N/A
**026 " "	" " " "		
**003 " "	" " " "		
**035 " "	" " " "		
*065 " "	" " " "		
**034 " "	" " " "		
*120 " "	" " " "		
**041 " "	" " " "		
**015 " "	" " " "		
**044 " "	" " " "		
**008 " "	" " " "		
*100 " "	" " " "		
*110 " "	" " " "		
**038 " "	" " " "		

EXAMINER Kenneth A. Kane LEVEL II DATE 9/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Kane LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER ANIL RAVILLADANKA DATE 10/5/93

* To be installed on S.G. "A" cold leg
** To be installed on S.G. "A" hot leg
SC 9-27-93

NES 9/90 - REV. 1

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. _____
THERMOMETER S/N MR9207
TEMPERATURE* 120 ° F
NOMINAL THICKNESS 1.8 INCHES
MATERIAL CS
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. 0
PAGE 8 OF 8

SYSTEM EXAMINED UNIT 2 STEAM GENERATOR ISO/DWG/SK. # PARTS ISO. NOT YET DETERMINED REVISION N/A

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry [N/A] Wet [X]
Make MAGNAFLUX
Type 14AM
Batch No. 93G02P
Color FLUORESCENT

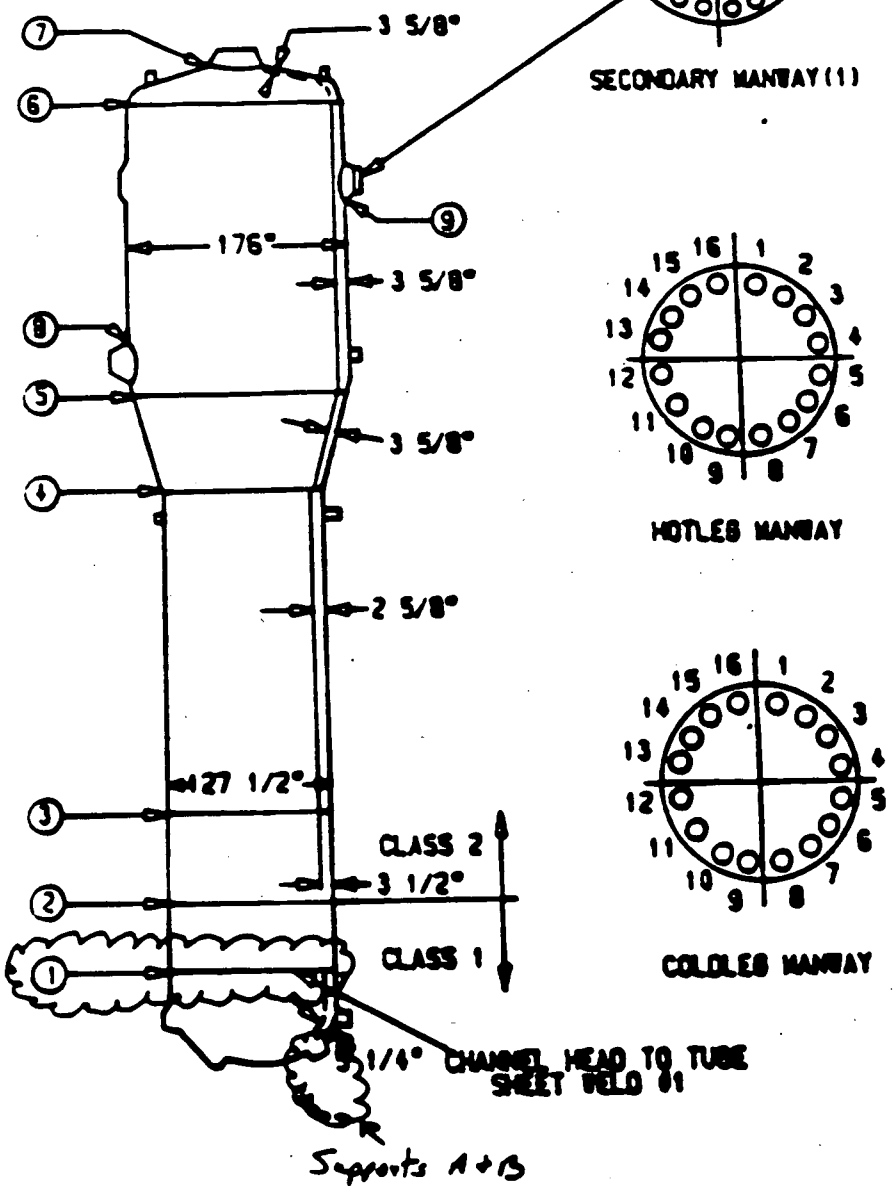
EQUIPMENT

Yoke [N/A] Coil [N/A] Prod [N/A]
Make MAGNAFLUX P/1500
Serial No. ~~SR 86165~~ 9/2 KAN
AC [N/A] DC [X]
AMP Turns N/A
AMPS 750/1400
Pole Spacing N/A
Yoke Lift Test
Yes [N/A] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
300 (SG NUT)	NO RECORDABLE INDICATIONS NOTED	X	N/A
	N/A	N/A	N/A

EXAMINER Kenneth R. Stone LEVEL II DATE 9/16/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamm LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Ann A. Wallendorf DATE 10/5/93

DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/89



INFO ONLY

AUG 2 5 19

NOTES:

1. CLASS 2 PORTION WAS CPL-201

CPL-105A REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION STEAM GENERATOR B	
LINE NO.	CPL-105A REV

I certify that the image contained on this frame was made in the normal and regular course of business on the date stated below and that it is an accurate reproduction of

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-108
Page 1 of 1
PSI☐ ISI☒

Project Job No.

System: S/G	Component Name: Support / Hanger	Component ID: 10SA A
Drawing/Location: CPL-10SA M/C / Steam Generator "A" - R.B.		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-11-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐

ISI Reviewer: [signature] 10/12/93

ANII R Valladares 10/13/93

DATA SHEET NO. 1218-008
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL C/S
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED STEAM GENERATOR B ISO/DWG/SK. # CPL-105A REVISION 0
DATUM POINT REFERENCE ____

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 831067
Color RED

EQUIPMENT
Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

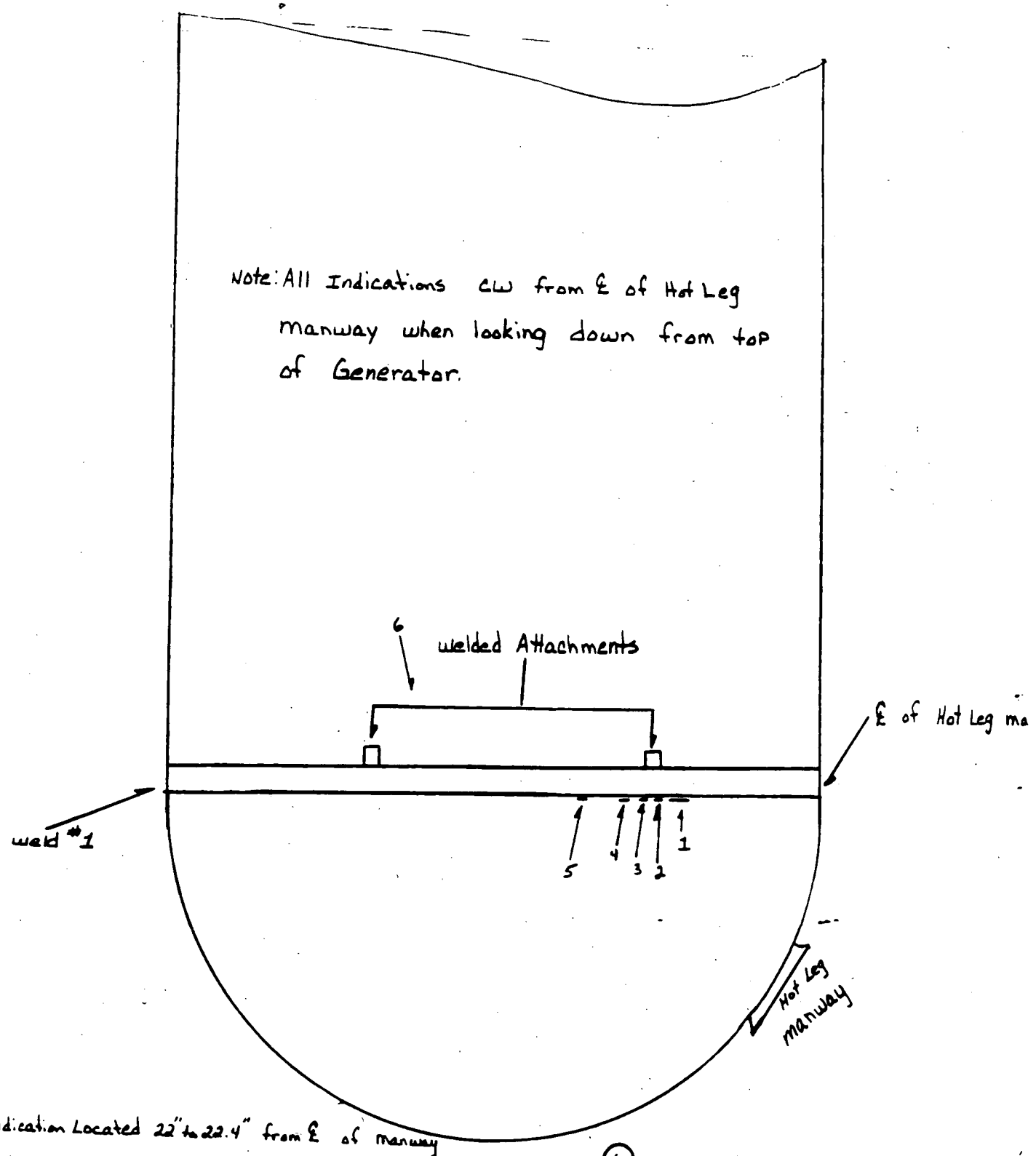
EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 1	5 LINEAR INDICATIONS	N/A	☒
	SEE ATTACHED SKETCH FOR LENGTHS		
	AND LOCATIONS		
	LIMITED EXAM TOTAL OF 5½" DUE TO		
	WELDED ATTACHMENTS.		
	N A		

EXAMINER Tim Oddom LEVEL II DATE 10-2-93
EXAMINER Steve Wolfson LEVEL II DATE 10-2-93
REVIEWER Scott Lamm LEVEL III DATE 10-4-93
REVIEWER Richard B. Wilcox DATE 10/5/93
REVIEWER David A. Belluardo DATE 10/5/93

Examiners: Tim Adkins LV II 10-2-9

Steve Wollum LV II 10-2-9

Steam Generator B



1) Indication Located 22" to 22.4" from ℄ of manway
2) Indication Located 22.6" to 22.9" from ℄ of manway
3) Indication Located 23" to 23.25" from ℄ of manway
4) Indication Located 24.5" to 24.7" from ℄ of manway
5) Indication Located 26.75" to 26.95" from ℄ of manway

6) Welded Attachments Located 21" to 23¾" and 122½" to 125½" from ℄ of Manway

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-109
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: S/G	Component Name: Support / Hanger	Component ID: 105A-B
Drawing/Location: CPL 105A/C / RX Bldg. Steam Generator 'B' - RX. Bldg.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☐ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-11-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ [illegible]

ISI Reviewer: [signature] 10/12/93

[illegible] 10/13/93

DATA SHEET NO. 1222-001
PAGE 1 OF 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

105A-WELD 1

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 6.40 Delay 802
Range 2.5"
Gain (coarse) 0 dB
Gain (fine) 26 dB
Reference Sensitivity 26 dB
Remarks: N/A

SEARCH UNIT

Serial No. 609014
Size 1"
Frequency 2.25 MHz
Mode LONG
Nom. Angle 0 °
Measured Angle N/A °
Cable Type BNC-BNC
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-51
"T" 5.25" Dia. N/A
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .6"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

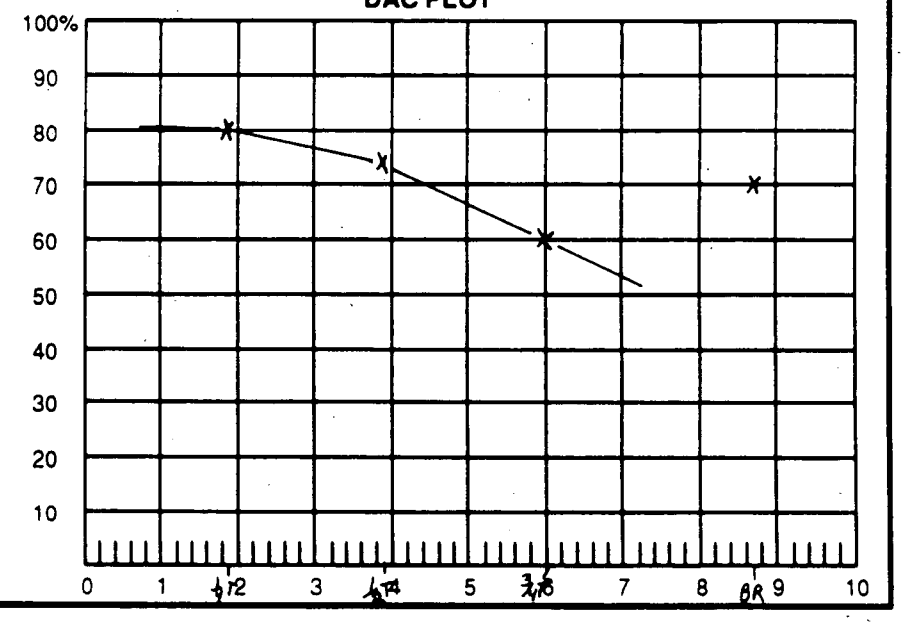
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	80
20	+12	79

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0910
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1545

REMARKS:

EXAMINERS	1	Tim Oldham	LEVEL II	DATE	10-3-93
	2	Steve Wollum	LEVEL I	DATE	10-3-93
REVIEWERS	1	Scott Larson	LEVEL III	DATE	10-4-93
	2	Richard B. Weber	LEVEL N/A	DATE	10/5/93
	3	A Wallace	LEVEL ANII	DATE	10/5/93

DATA SHEET NO. 1222-001
PAGE 2 OF 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

105A - WELD 1

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 9.18 Delay 7.58
Range 2.5"
Gain (coarse) 0 dB
Gain (fine) 30 dB
Reference Sensitivity 30 dB
Remarks: N/A

SEARCH UNIT

Serial No. G10188
Size .5" x 1"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-BNC
Cable Length 6'
Remarks: .7" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-51
"T" 5.25" Dia. N/A
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .8"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

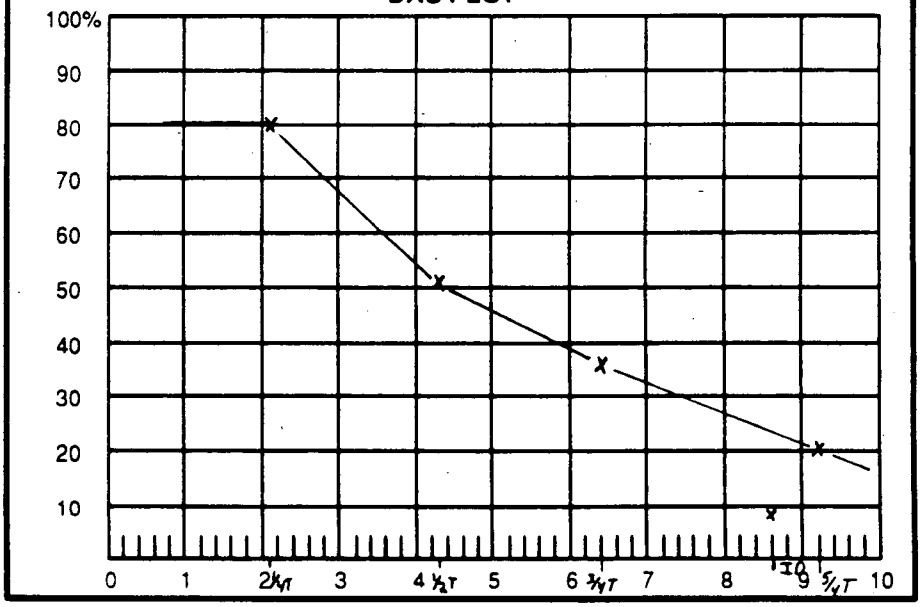
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1020
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1540

REMARKS:

EXAMINERS	1	Tim Adams	LEVEL II	DATE	10-3-93
	2	Steve Wollyn	LEVEL I	DATE	10-3-93
REVIEWERS	1	Scott Lawn	LEVEL III	DATE	10-4-93
	2	Richard B Weber	LEVEL N/A	DATE	10/5/93
	3	R Valladares	LEVEL ANII	DATE	10/5/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-001
PAGE 3 OF 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

105A - WELD 1

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 6.66 Delay 8.24
Range 10"
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity 42 dB
Remarks: N/A

SEARCH UNIT

Serial No. C09104
Size .5" x 1"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type BNC - BNC
Cable Length 6'
Remarks: .75" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-51
"T" 5.25" Dia. N/A
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = 1.5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

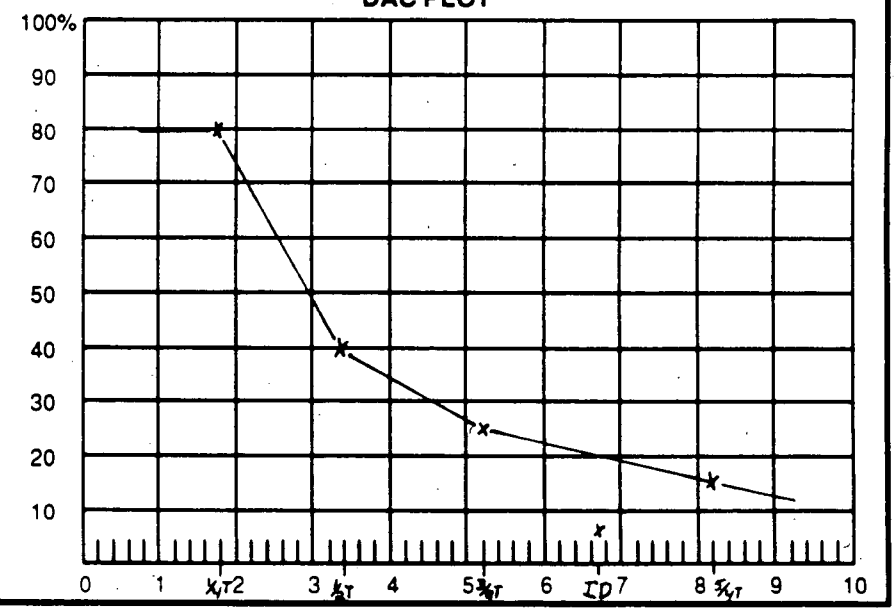
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1130
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1550

REMARKS:

EXAMINERS 1 Tim Olsen LEVEL II DATE 10-3-93
2 Steve Wollum LEVEL I DATE 10-3-93

REVIEWERS 1 Scott Larson LEVEL III DATE 10-4-93
2 Gilbert B. Weber LEVEL N/A DATE 10/5/93
3 A Palladino LEVEL ANII DATE 10/5/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-001
PAGE 4 OF 8
EXAM ITEM

Weld 1

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Steam Generator B
ISO/DWG. NO. CPL-105A REV. ______
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

SCAN 0 ° SCAN dB 32				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
☒	N/A	N/A	N/A	N/A	☒	N/A	☒	N/A	☒	☒	N/A

REMARKS: Scanned 0" – 140" CW from ℄ of Hot Leg Manway When Looking Down from Top of Generator, See Attached Sketch
Scan Limited See Previous ISI Data.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 Tim Oldham LEVEL II DATE 10-3-93
2 Steve Wollum LEVEL I DATE 10-3-93

REVIEWERS:
1 ______ LEVEL III DATE 10-4-93
2 Richard B. Weber LEVEL N/A DATE 10/5/93
3 A. Valladares LEVEL ANII DATE 10/5/93

DATA SHEET NO. 1222-001
PAGE 5 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM STEAM GENERATOR B
ISO/DWG. NO. CPL-105A REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM

WELD 1

SCAN 45 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: SCANNED 0"-140" C.W. FROM ℄ OF HOT LEG MANWAY WHEN LOOKING DOWN FROM TOP OF GENERATOR. SEE ATTACHED SKETCH. SCAN LIMITED SEE PREVIOUS ISI DATA.

SCAN 45 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A		N/A		N/A			N/A

REMARKS: SCANNED 0"-140" C.W. FROM ℄ OF HOT LEG MANWAY WHEN LOOKING DOWN FROM TOP OF GENERATOR. SEE ATTACHED SKETCH. SCAN LIMITED SEE PREVIOUS ISI DATA.

SCAN 60 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A			N/A	N/A			N/A

REMARKS: GEOMETRY INDICATION SEEN FROM 0" TO 140" C.W. AT VARYING AMPLITUDES. SEE SKETCH FOR SCAN AREA. SCAN LIMITED SEE PREVIOUS ISI DATA.

SCAN 60 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A		N/A		N/A			N/A

REMARKS: SCANNED 0"-140" C.W. FROM ℄ OF HOT LEG MANWAY WHEN LOOKING DOWN FROM TOP OF GENERATOR. SEE ATTACHED SKETCH. SCAN LIMITED SEE PREVIOUS ISI DATA.

EXAMINERS:
1 Tim Addison LEVEL II DATE 10-3-93
2 Steve Wollum LEVEL I DATE 10-3-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 Richard B. Weber LEVEL N/A DATE 10/5/93
3 R. Wallace LEVEL ANII DATE 10/5/93

EXAM ITEM: weld 1

ISO/DWG. NO.: CPL-105A

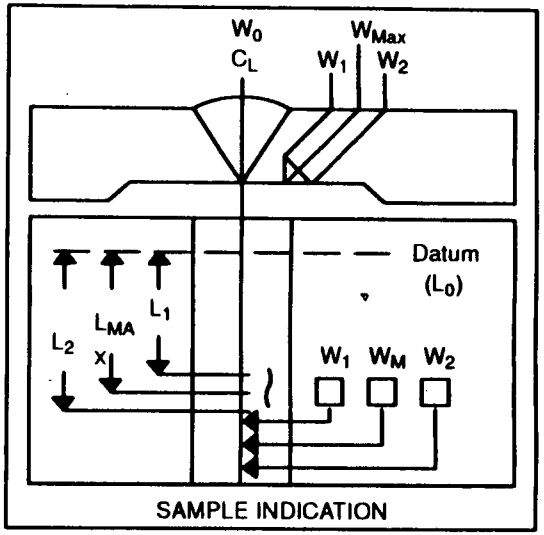
ULTRASONIC INDICATION REPORT SHEET

- [N/A] PIPING WELDS
- [X] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1222-007

PAGE 6 OF 8

SEARCH UNIT ANGLE 60 ° W_0 LOCATION ℄ of Weld L_0 LOCATION ℄ of Hot Leg Manway



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	FWD W	FWD MAX	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	100 %	11.5"	7.5	11.0"	7.3	*	*	N/A	1.25" CW	N/A	N/A	Tube sheet side	Obstructed Due To Insulation Ring
							N/A						

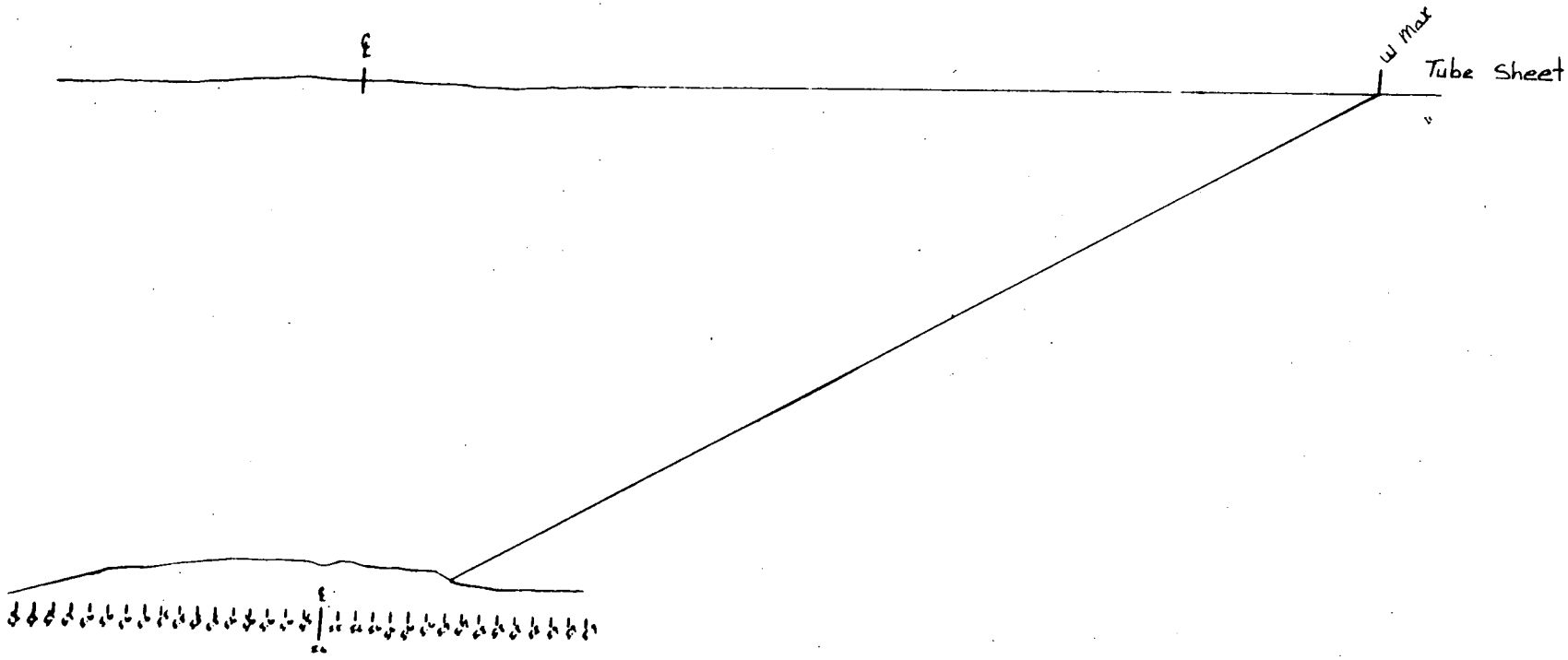
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	Tim Adkison	LEVEL II	DATE 10-3-93
	2	Steve Wollam	LEVEL I	DATE 10-3-93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-4-93
	2	Richard B. Weber	LEVEL N/A	DATE 10/5/93
	3	[signature]	LEVEL ANII	DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.

1222-001
7 of 8

Weld No. 1
ISO/Dwg No. CPL-105A



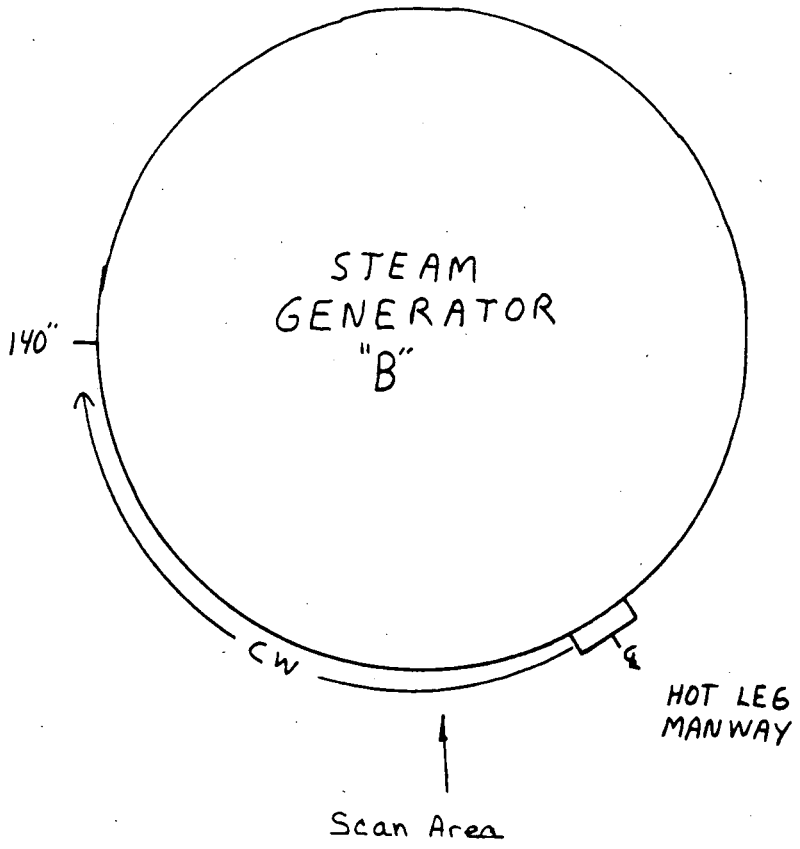
½ Scale

Examiners: Tim Oddson LV. II 10-3-93

Steve Wollum LV I 10-3-93

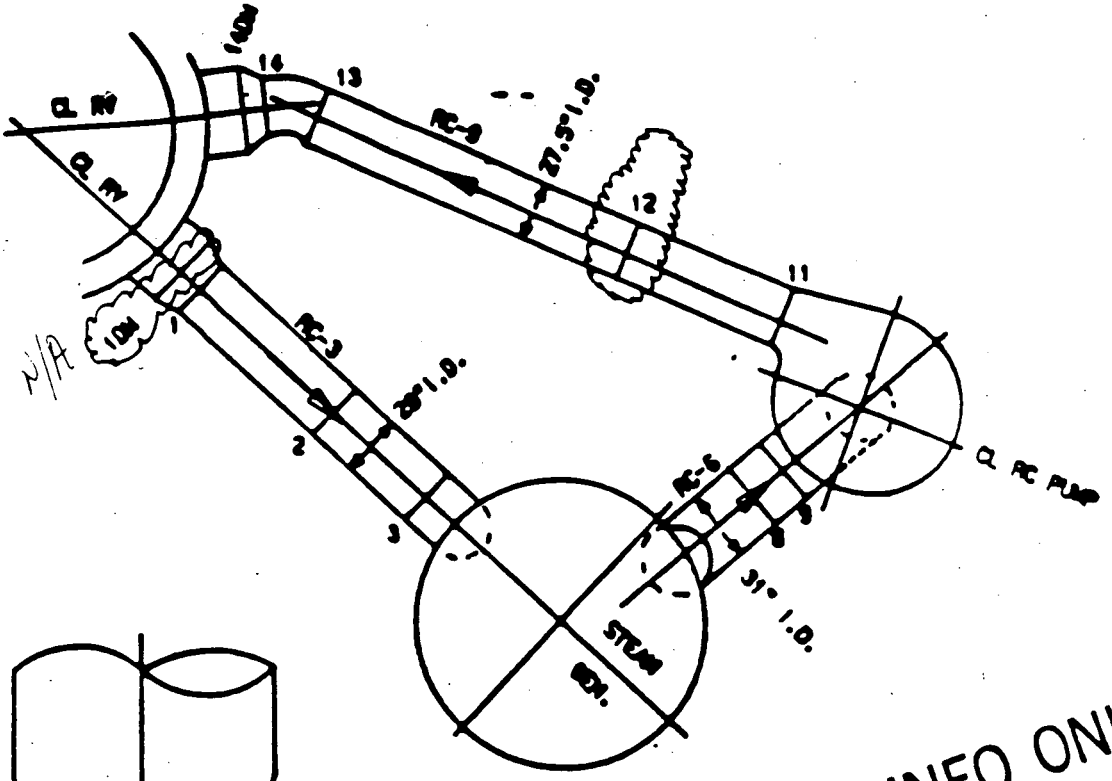
1222-001
8 of 8

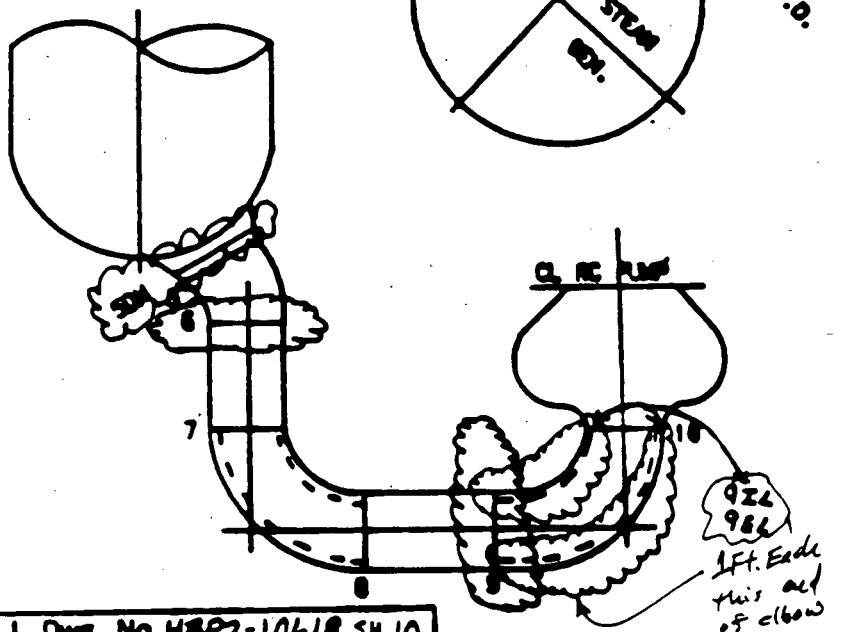
LOOKING DOWN FROM TOP OF GENERATOR.



EXAMINER Tim Addison LEVEL II DATE 10-3-93

EXAMINER Steve Wollum LEVEL I DATE 10-3-93





INFO ONL

AUG 2 5

1 Ft. Each this end of elbow

CP & L Dwg. No. HBR2-10618 SH. 10					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/89

NOTES:
1. Q.=CENTER LINE

CPL-107 REV. 0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION REACTOR COOLANT SYSTE	
LINE NO.	CPL-107

DATA SHEET NO. 1217-031
THERMOMETER S/N MR92-04
TEMPERATURE 83 ° F
NOMINAL THICKNESS 3.2 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Reactor Coolant System ISO/DWG/SK. # CPL-107 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 4	No Recordable Indications	X	N/A
Weld No. 40m	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd / Chris D. Judd LEVEL II DATE 9-29-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-29-93
REVIEWER Scott Sawyer LEVEL III DATE 9-29-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER Ann I. Abbadessa DATE 9/29/93

DATA SHEET NO. 1217-014
THERMOMETER S/N MR92-04
TEMPERATURE 83 ° F
NOMINAL THICKNESS 3.2 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Reactor Coolant System ISO/DWG/SK. # CPL-107 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 5	No Recordable Indications	X	N/A
Weld No. 5DM	No Recordable Indications	X	N/A
Weld No. 6	No Recordable Indications	X	N/A
	N A		

EXAMINER Chris D. Judd/CQ D. Judd LEVEL II DATE 9-24-93
EXAMINER Benjamin Sanborn LEVEL I DATE 9-24-93
REVIEWER Scott Fraser LEVEL III DATE 9-25-93
REVIEWER Richard B Weber DATE 9/29/93
REVIEWER ANIL R Balladares DATE 9/29/93

DATA SHEET NO. 1217-0041
THERMOMETER S/N MR92-04
TEMPERATURE 87 ° F
NOMINAL THICKNESS 3.2 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Reactor Coolant System A ISO/DWG/SK. # CPL-107 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 9	No Recordable Indications	X	N/A
	N/A		
Weld No. 9 IL	No Recordable Indications	X	N/A
	Examined 12" of Longitudinal Seam		
	from Intersecting Weld No. 9		
	Circumferential Weld		
	N/A		
Weld No. 9EL	No Recordable Indications	X	N/A
	Examined 12" of Longitudinal Seam		
	from Intersecting Weld No. 9		
	Circumferential Weld		
	N/A		

EXAMINER Chris D. Judd/CDJ LEVEL II DATE 9-20-93
EXAMINER [signature] LEVEL III DATE 9/20/93
REVIEWER Scott Larson LEVEL III DATE 9-20-93
REVIEWER Richard B. Weber DATE 9/21/93
REVIEWER [signature] DATE ANII 9-21-93

DATA SHEET NO. 1217-017
THERMOMETER S/N MR92-04
TEMPERATURE 84 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Reactor Coolant System ISO/DWG/SK. # CPL-107 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 12	No Recordable Indications	X	N/A
	N		
	A		

EXAMINER Chris D. Judd/Ch D. Judd LEVEL II DATE 9-25-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-25-93
REVIEWER Scott Larson LEVEL II DATE 9-25-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER AN II R Valladares DATE 9/29/93

DATA SHEET NO. 1226-002
PAGE 1 OF 10
CPL-107 Weld #4, 4DM, 5, 5DM 6, 9, 12

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1226
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 7.22 Delay 6.73
Range 25
Gain (coarse) 20 ⊥ / 20 = dB
Gain (fine) 22 ⊥ / 32 = dB
Reference Sensitivity 42 ⊥ / 52 = dB
Remarks: N/A

SEARCH UNIT

Serial No. K03904
Size .5" x 1.0"
Frequency 1.0 MHz
Mode Shear
Nom. Angle 45° °
Measured Angle 44° °
Cable Type RG 58A/U
Cable Length 12'
Remarks:

CALIBRATION BLOCK

No. CPL RCP WSS 01
"T" 2.6" Dia. 27.5" ID
Temperature 73 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path N/A Depth ☐
Each Major Screen Div. = .325"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

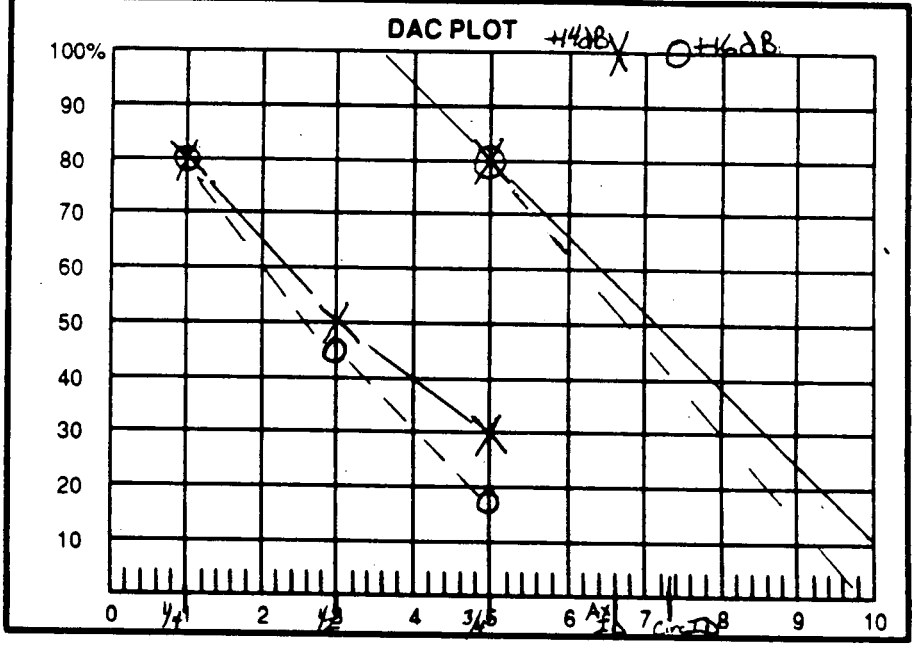
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1000
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1345

REMARKS: Axial Scan Dac Slope Gain 20/16
Circ Scan Dac Slope Gain 20/18

EXAMINERS 1 [signature] LEVEL III DATE 10/3/93
2 [signature] LEVEL II DATE 10/3/93
REVIEWERS 1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/5/93
3 [signature] LEVEL ANII DATE 10/6/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1226-002
PAGE 2 OF 10

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #4 / R.C.S.
ISO/DWG. NO. CPL-107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

EXAM ITEM
CPL-107 WELD #4

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: Elbow to Pup Piece, Limited on Elbow Side Due to Elbow Configuration See Attached Profile.

Note: Non-Valid ID Geometry Seen 360° Intermittant

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A		N/A		N/A			N/A

REMARKS: Elbow to Pup Piece, Limited on Elbow Side Due to Elbow Configuration. See Attached Profile

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 David G Monte LEVEL II DATE 10/3/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/5/93
3 [signature] LEVEL ANII DATE 10/6/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1226-002
PAGE 3 OF 10
EXAM ITEM
CPL-107 WELD #40M

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #40M/RCS
ISO/DWG. NO. CPL-107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: Pup Piece to S/G Nozzle, Pup Piece Side Only.
See Attached Profile

Note: Non Valid ID Geometry Seen 360° Intermittant

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A		N/A		N/A			N/A

REMARKS: Pup Piece to S/G Nozzle, Pup Piece Side Only
See Attached Profile

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

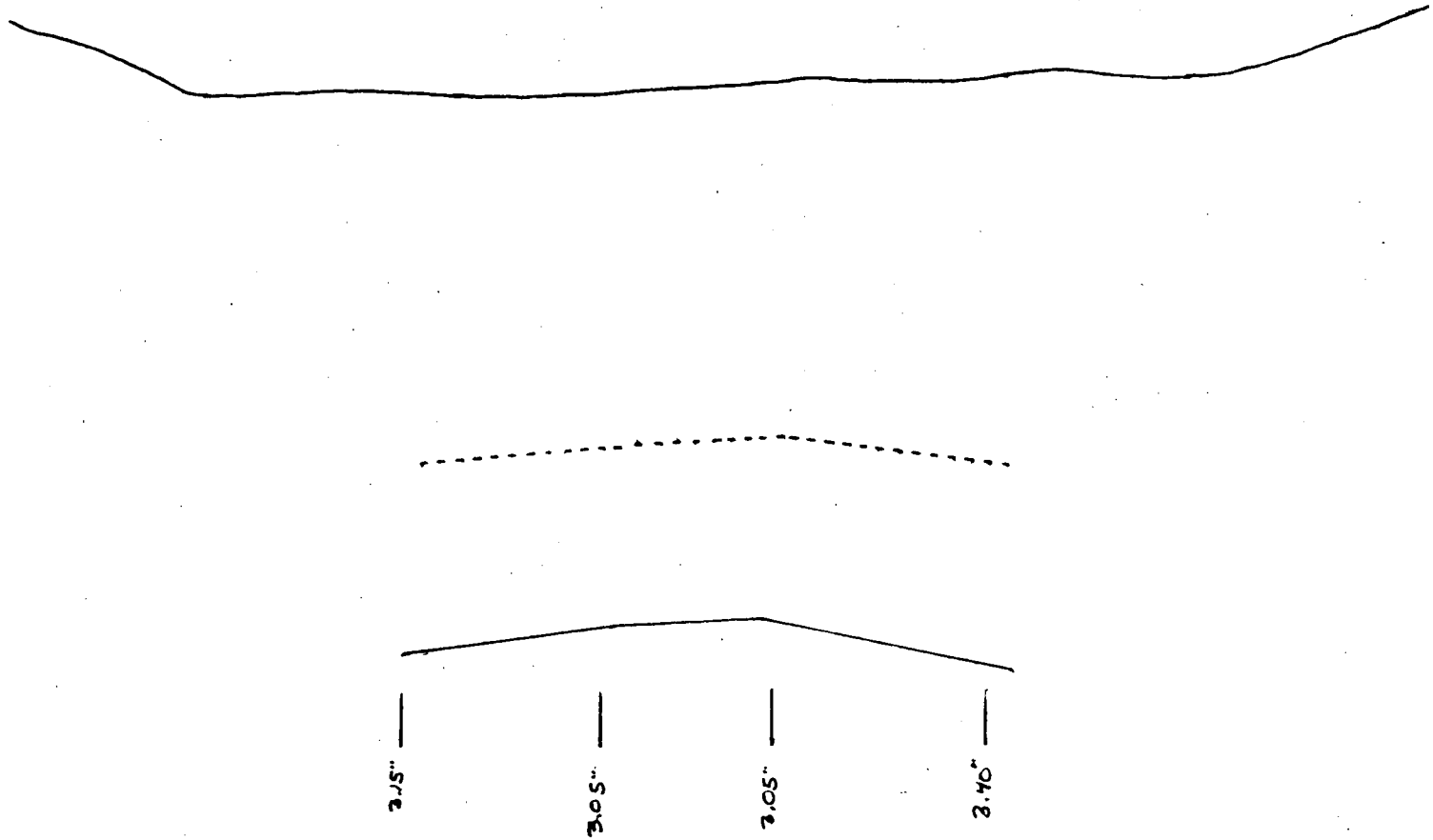
EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 [signature] LEVEL II DATE 10/3/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/5/93
3 [signature] LEVEL ANII DATE 10/6/93

S/G SIDE

Profile of
WELDS 4, 4DM

ELBOW SIDE



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10/3/93

DATA SHEET NO. 1226-002
PAGE 5 OF 10
EXAM ITEM
EPL-107 WELD #5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #5/RCS.
ISO/DWG. NO. EPL-107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Pup Piece to Elbow, Limited on Elbow Side Due to Elbow Configuration. See Attached Profile

Note: Non Valid ID Geometry Seen 360° Intermittant.

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Pup Piece to Elbow, Limited on Elbow Side Due to Elbow Configuration, See Attached Profile

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 David M Mantor LEVEL II DATE 10/3/93

REVIEWERS:
1 Scott Lamp LEVEL III DATE 10-4-93
2 Richard B. Weber LEVEL N/A DATE 10/5/93
3 R Valladares LEVEL ANII DATE 10/6/93

DATA SHEET NO. 1226-002
PAGE 6 OF 10

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #50M/RCS
ISO/DWG. NO. CDL-107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

EXAM ITEM
CDL-107 WELD # 50M

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: S/G Nozzle to Pup Piece, Pup Piece Side Only
See Attached Profile

Note: Non Valid ID Geometry Seen 360° Intermittent

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A		N/A		N/A			N/A

REMARKS: S/G Nozzle to Pup Piece, Pup Piece Side Only
See Attached Profile

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 [signature] LEVEL II DATE 10/3/93

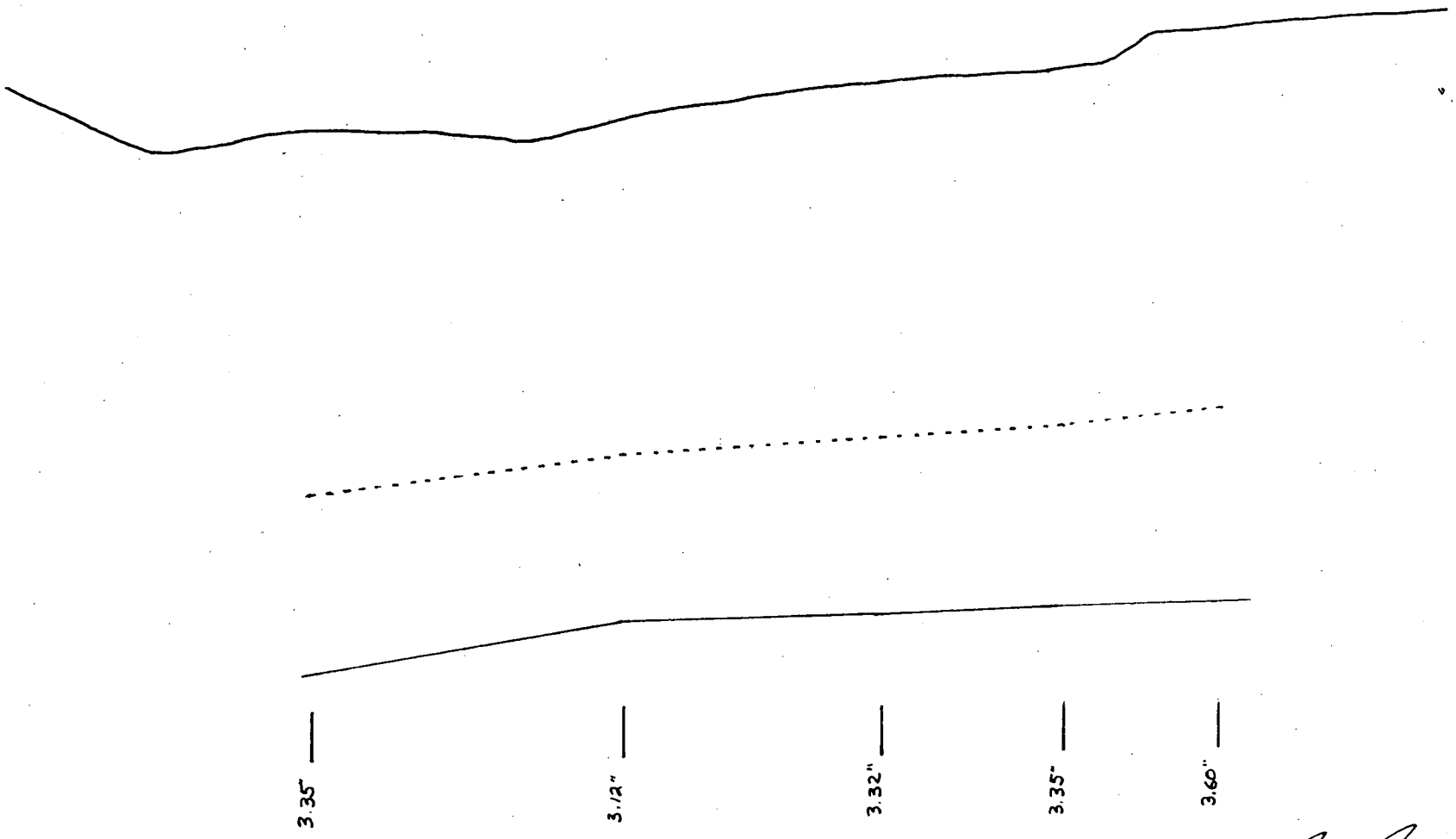
REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/5/93
3 [signature] LEVEL ANII DATE 10/6/93

Profile of

S/G SIDE

WELDS 5, 50M

ELBOW SIDE



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10/3/93

DATA SHEET NO. 1226-002
PAGE 8 OF 10

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #6/R.C.S.
ISO/DWG. NO. CAL-107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

EXAM ITEM
CAL-107 WELD #6

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: Elbow to Pipe, Limited on Elbow Side Due to Elbow Configuration (See Previous ISI Data Sor Exam Limitation Dated 2/26/84)
Note: Non-Valid Root Geometry Seen Intermittent 360°

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A		N/A	N/A		N/A			N/A

REMARKS: Elbow to Pipe, Complete Both Sides

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 [signature] LEVEL II DATE 10/3/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/5/93
3 [signature] LEVEL ANII DATE 10/6/93

DATA SHEET NO. 1226-002
PAGE 9 OF 10

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #9/RCS
ISO/DWG. NO. CPL-107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 °F

EXAM ITEM
CPL-107 WELD # 9

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Elbow, Complete Pipe Side Only

Note: Non Valid Root Geometry Seen Intermittent 360°

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Elbow, Complete Pipe Side Only

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 David M Master LEVEL II DATE 10/3/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/5/93
3 [signature] LEVEL ANII DATE 10/6/93

DATA SHEET NO. 1226-002
PAGE 10 OF 10

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #12/RCS
ISO/DWG. NO. CPL-107 REV. 0
THERMOMETER S/N 462
COMPONENT TEMP. 87 ° F

EXAM ITEM
CPL-107 WELD #12

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Pipe, Complete Both Sides.

Note: Non Valid Root Geometry Seen 360° Intermittant

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Pipe, Complete Both Sides

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/3/93
2 David M Master LEVEL II DATE 10/3/93

REVIEWERS:
1 Scott Lamm LEVEL III DATE 10-4-93
2 Richard B. Weber LEVEL N/A DATE 10/5/93
3 R Wallace LEVEL AWS II DATE 10/6/93

NES 9/90 - REV. 1

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1226-001
PAGE 1 OF 4
107 9 (Elbow Side)
107 4IL and 9EL

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1226
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model LLSL - 48
Serial No. 213220-4
Sweep Length 6.71 Delay 7.98
Range x.5
Gain (coarse) 60 dB
Gain (fine) 10 + 6 = dB
Reference Sensitivity 70 + 66 = dB
Remarks: N/A

SEARCH UNIT

Serial No. L04260/L04261
Size 1"
Frequency .75 MHz
Mode Long.
Nom. Angle 45° °
Measured Angle 45° °
Cable Type RG 58A/U
Cable Length 2x6'
Remarks: Contoured Wedges

CALIBRATION BLOCK

No. CAL-RCP-C55 El. 01
"T" 3.5 Dia. 36"
Temperature 72.7 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path N/A Depth ☒
Each Major Screen Div. = .5
Remarks N/A

COUPLANT

Brand Ultragel
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

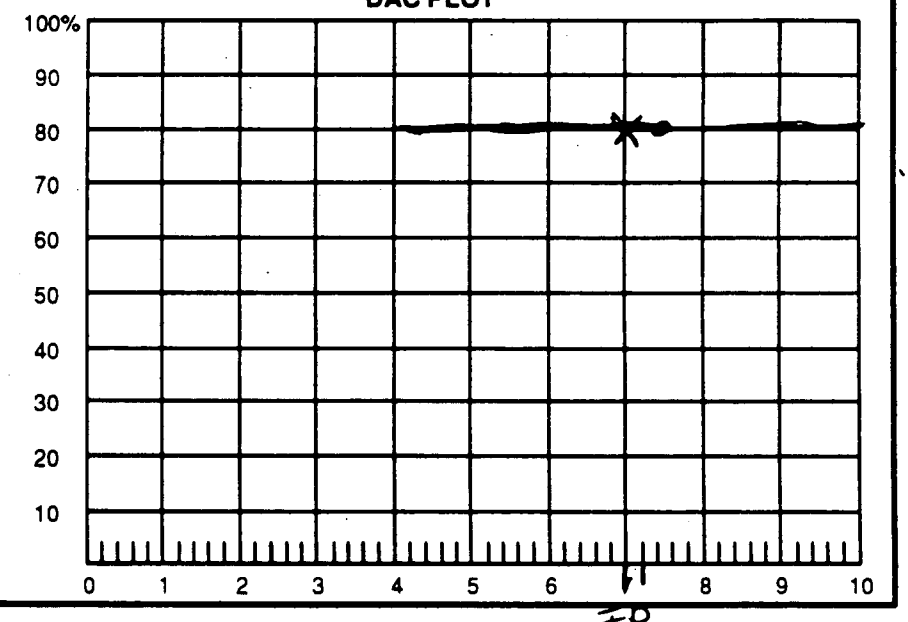
	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	38
80	-12	18
40	+6	78
20	+12	78

CAL. CHECKS	TIME
INITIAL CAL.	10:05
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	13:50

DAC PLOT



REMARKS: X = Axial Notch • = Circ Notch

EXAMINERS	1	[signature]	LEVEL III	DATE 10-3-93
	2	[signature]	LEVEL III	DATE 10/3/93
REVIEWERS	1	Richard B. Weber	LEVEL N/A	DATE 10/5/93
	2	[signature]	LEVEL ANII	DATE 10/5/93
	3		LEVEL	DATE

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1226-001
PAGE 2 OF 4

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC
ISO/DWG. NO. 107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

EXAM ITEM

107	9	Circ. Weld Elbow Side

SCAN 45 ° SCAN dB 72				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: Exam limited by OD transition on elbow side. Refer to previous ISI data (2-26-84) for limitations.

SCAN 45 ° SCAN dB 76				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A		N/A	N/A		N/A			N/A

REMARKS: Complete elbow side only.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Scott Lang LEVEL III DATE 10-3-93
2 [signature] LEVEL III DATE 10/3/93

REVIEWERS:
1 Richard O. Weber LEVEL N/A DATE 10/5/93
2 R. Wallendorf LEVEL ANII DATE 10/5/93
3 _____ LEVEL _____ DATE _____

DATA SHEET NO. 1226-001
PAGE 3 OF 4

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC
ISO/DWG. NO. 107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 °F

EXAM ITEM

107 9 IL

SCAN 45° SCAN dB 76				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 1 foot of long seam examined Noise level at ~25% FSH. 8" of exam surface is very rough.

SCAN 45° SCAN dB 72				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 1 foot of long seam examined. 8" of exam surface is very rough.

SCAN ____° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 _____ LEVEL III DATE 10-3-93
2 _____ LEVEL III DATE 10/3/93

REVIEWERS:
1 Richard B. Weber LEVEL N/A DATE 10/5/93
2 L P Wallace LEVEL ANII DATE 10/5/93
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1226-001
PAGE 4 OF 4

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC
ISO/DWG. NO. 107 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 °F

EXAM ITEM: 107 9 EL

SCAN 45° SCAN dB 76				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 1' of long seam examined. Noise level at ~25% of FSH. 8" of exam surface is very rough.

SCAN 45° SCAN dB 72				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 1' of long seam examined. Noise level at ~15% FSH. 8" of exam surface is very rough.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

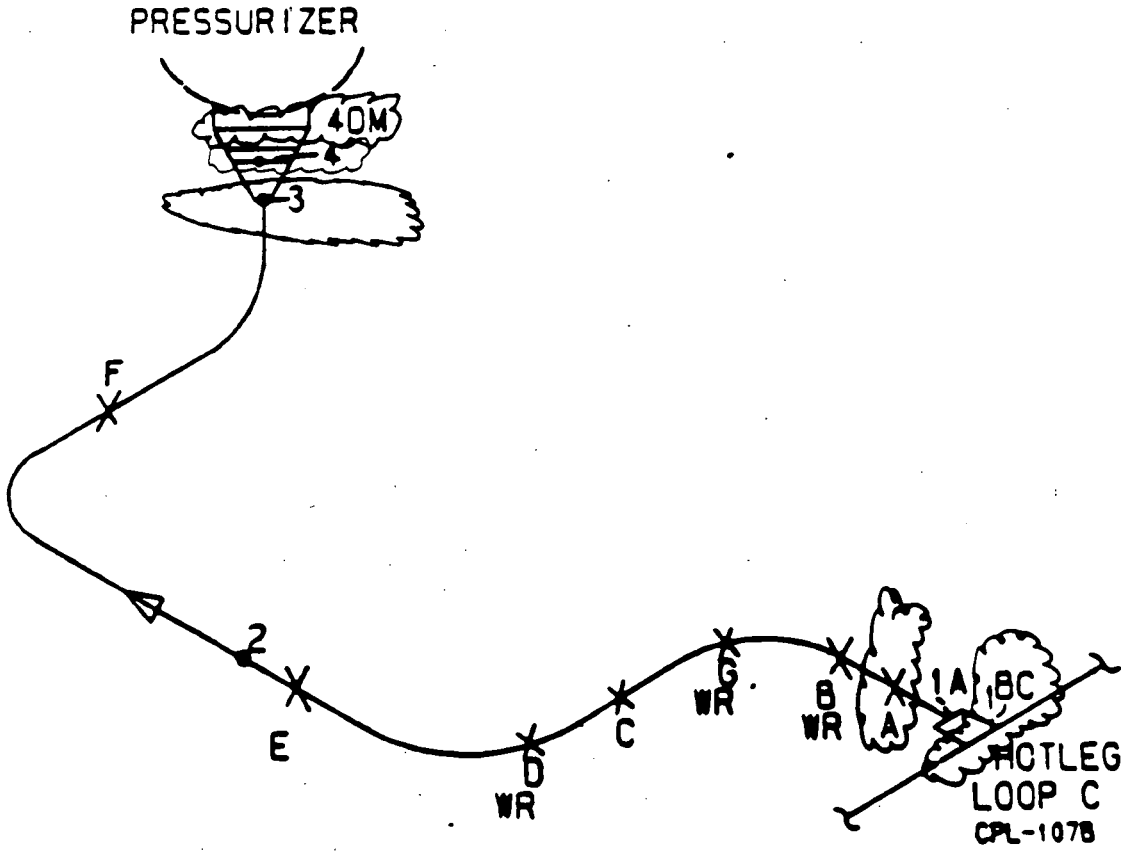
SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10-3-93
2 Richard A. Weber LEVEL N/A DATE 10/5/93

REVIEWERS:
1 [signature] LEVEL AN II DATE 10/5/93
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

SPRING HANGERS
A, C, E, F



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-10618 SH. 13					
CP & L P.O. No. CPL-51					
OWNR. REV.	FIELD VERIFIED BY	ENGRD BY	CHKD BY	APPD BY	DATE
0	RAW	CPL	CLD	CLD	12/11/91

CPL-108 REV.0

H.B. ROBINSON S.E. PLANT		
UNIT NO. 2		
DESCRIPTION 14"&12" PRESS. SURGE LINE		
LINE NO. 12-RC-18	CPL-108	REV.

I certify that the items contained on this frame was made

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-030
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RC	Component Name: VARIABLE SUPPORT	Component ID: 108A
Drawing/Location: CPL-108 R/O / RX. Bldg. 228' - "C" GENERATOR		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 1870 #		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments: Drawing Requires A Hot Setting of 1932 # And A Cold Setting of 1910 # And procedure SP-1230 Allows A ± 10% Tolerance From These Specified Settings. (Section 3.1.1.3)

Reviewed: [signature] LEVEL III 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANII RP Valladares 10/5/93

DATA SHEET NO. 1217-051
THERMOMETER S/N MR92-03
TEMPERATURE 82 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S/S
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. 0
PAGE 1 OF 1

SYSTEM EXAMINED 14"x12" PRESS. SURGE LINE ISO/DWG/SK. # CPL-108 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD # 1 BC	NO RECORDABLE INDICATIONS	X	N/A
	N		
	A		

EXAMINER Tim Aldsm LEVEL II DATE 10-8-93
EXAMINER Benjamin Sanders LEVEL I DATE 10-8-93
REVIEWER [illegible] LEVEL III DATE 10-9-93
REVIEWER Richard B. Weber DATE 10/9/93
REVIEWER ANIL R. Valladares DATE 10-11-93

DATA SHEET NO. 1217-052
THERMOMETER S/N MR92-04
TEMPERATURE 78 ° F
NOMINAL THICKNESS 1.25 INCHES
MATERIAL SS + CS/SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED PRESSURIZER ISO/DWG/SK. # CPL-108 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-S	93F03K	5 MINUTES
DEVELOPER	"	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 4DM	NO RECORDABLE INDICATIONS NOTED	X	N/A
" 4	" " " "	X	
" 3	NO INDICATIONS NOTED	X	
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 10-10-93
EXAMINER [signature] LEVEL III DATE 10-10-93
REVIEWER [signature] LEVEL N/A DATE 10/11/93
REVIEWER ANIL R. Walladares DATE 10-11-93
REVIEWER _____ DATE _____

DATA SHEET NO. 1223-020
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD #1BC

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 8.32 Delay 8.37
Range 5
Gain (coarse) 20 dB
Gain (fine) 32 dB
Reference Sensitivity 52 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .5"
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG-174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT
"T" 2.8" Dia. 14"
Temperature 85 °F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = 1.0 "
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

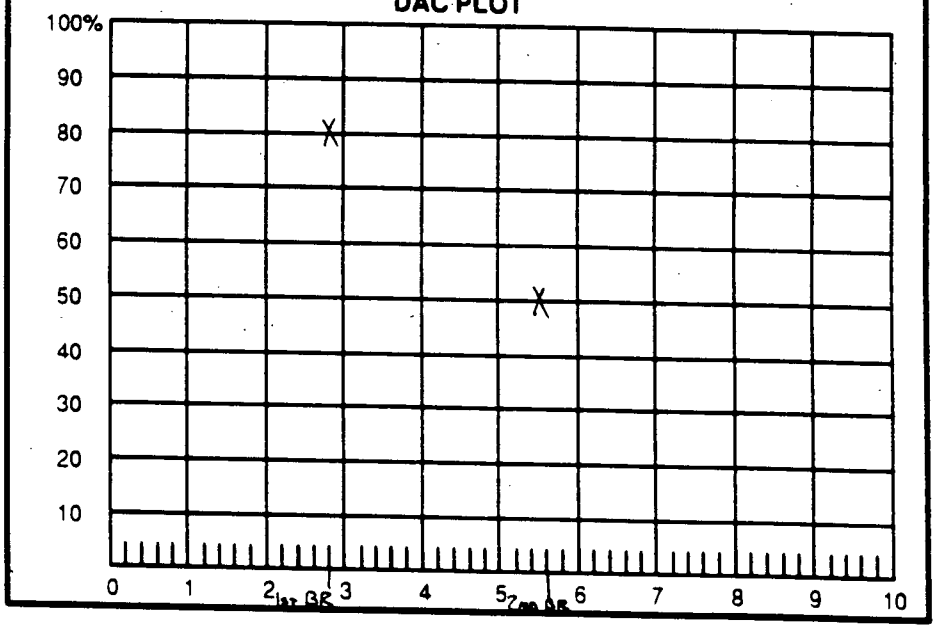
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1445
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1500

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10/10/93
2 [signature] LEVEL III DATE 10/10/93

REVIEWERS 1 [signature] LEVEL III DATE 10-10-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL A/II DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-020
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD # 1BC

INSTRUMENT

Model USN-7
Serial No. 1499
Sweep Length 9.32 Delay 9.05
Range 2.5
Gain (coarse) ± 20 / = 20 dB
Gain (fine) ± 16 / = 18 dB
Reference Sensitivity ± 36 / = 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. M20226
Size .5" x 1.0"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-58A/U
Cable Length 6'
Remarks: .65" EXIT POINT TO FRONT OF WEDGE
N/A

CALIBRATION BLOCK

No. CPL-RCP WSS 01
"T" 2.6" Dia. 27.5"
Temperature 76 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = 0.7"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

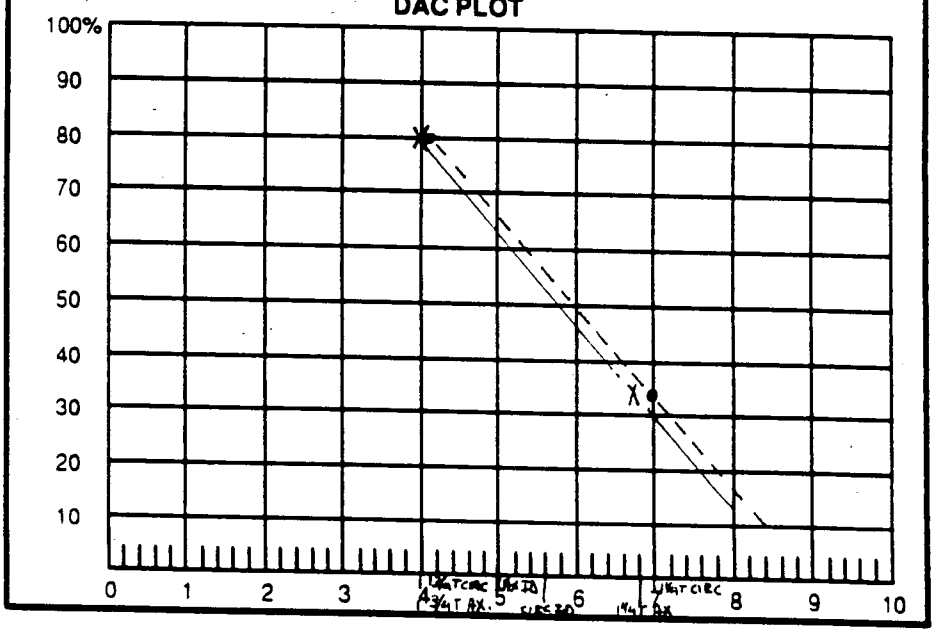
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	1330
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1650

DAC PLOT



REMARKS: AXIAL I.D NOTCH -14dB TO DAC
CIRC E.D. NOTCH -14dB TO DAC
X = AXIAL SCAN S.D.H.
• = CIRC SCAN SDH.

EXAMINERS 1 [signature] LEVEL II DATE 10/10/93
2 [signature] LEVEL III DATE 10/10/93
REVIEWERS 1 [signature] LEVEL III DATE 10-10-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL BA/II DATE 10/11/93

DATA SHEET NO. 1223-020
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD #13C

INSTRUMENT

Model USL-48
Serial No. 213220-4
Sweep Length 6.44 Delay 7.20
Range 10
Gain (coarse) +40 / = 40 dB
Gain (fine) + 20 / = 16 dB
Reference Sensitivity +60 / 56 dB
Remarks: N/A

SEARCH UNIT

Serial No. C09104
Size .5" x 1.0"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-58A/U
Cable Length 6'
Remarks: .65" EXIT POINT TO FRONT OF WEDGE
N/A

CALIBRATION BLOCK

No. CPL-RCP WSS 01
"T" 2.6" Dia. 27.5"
Temperature 76 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = 1.0"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

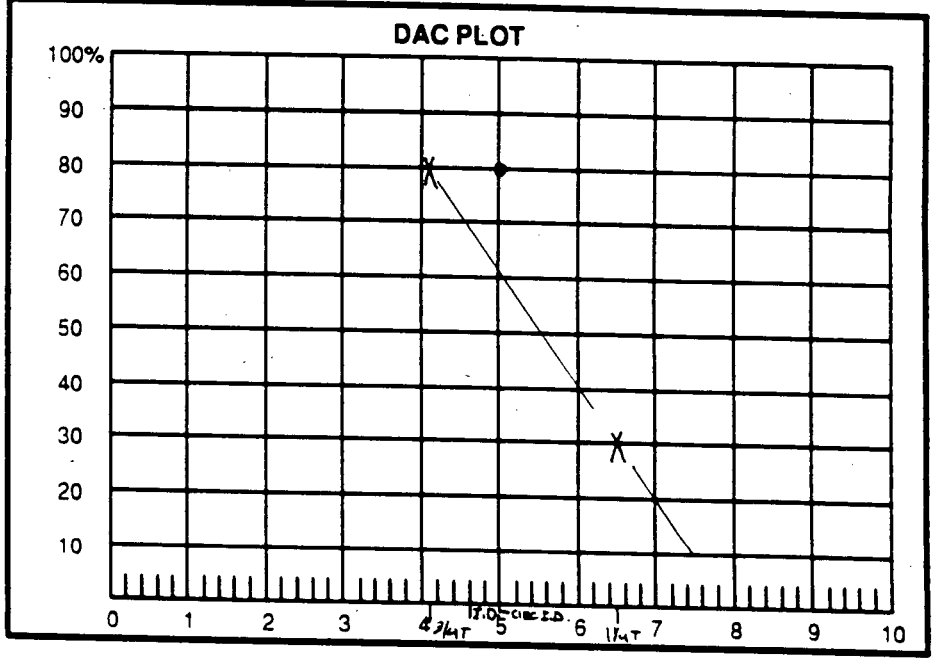
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1350
INTERMEDIATE	\
INTERMEDIATE	N/A
INTERMEDIATE	\
FINAL CAL.	1700

DAC PLOT



REMARKS: AXIAL SCAN, -12 dB I.D. NOTCH TO DAC
X = AXIAL SCAN SOH
• = CIRC SCAN I.D. NOTCH

EXAMINERS 1 [signature] LEVEL II DATE 10/10/93
2 [signature] LEVEL III DATE 10/10/93

REVIEWERS 1 [signature] LEVEL III DATE 10-10-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL AWS DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-020
PAGE 4 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #1BC / SURGE LINE
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 85 ° F

EXAM ITEM
CPL-108 WELD # 1BC

SCAN 0 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: BRANCH CONNECTION TO HOT LEG. COMPLETE FROM BRANCH CONNECTION SIDE ONLY.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 10/10/93
2 David W Martin LEVEL II DATE 10/10/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-10-93
2 Richard B Weber LEVEL N/A DATE 10/11/93
3 [signature] LEVEL CWII DATE 10/11/93

DATA SHEET NO. 1223-020
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM UNCLOSURE IBC / SURGE LINE
ISO/DWG. NO. CPL-10B REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 85 ° F

EXAM ITEM: CPL-10B WELD # 1 BC

SCAN 45 ° SCAN dB 28				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: BRANCH CONNECTION TO HOT LEG. COMPLETE FROM BRANCH CONNECTION SIDE ONLY.

SCAN 45 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: BRANCH CONNECTION TO HOT LEG - COMPLETE FROM BRANCH CONNECTION SIDE ONLY.

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: BRANCH CONNECTION TO HOT LEG. COMPLETE FROM BRANCH CONNECTION SIDE ONLY.

SCAN 60 ° SCAN dB 62				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: BRANCH CONNECTION TO HOT LEG. COMPLETE FROM BRANCH CONNECTION SIDE ONLY.

EXAMINERS:
1 [signature] LEVEL III DATE 10/10/93
2 David A Martin LEVEL II DATE 10/10/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-10-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL AWI DATE 10/11/93

DATA SHEET NO. 1223-021
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD 3

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 5.54 Delay 8.12
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 8 dB
Reference Sensitivity 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .5"
Frequency 5 MHz
Mode LONG
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT
"T" 1.15" Dia. 12"
Temperature 78 ° F
Thermometer S/N MR92-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .5"
Remarks 5" SCREEN RANGE

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

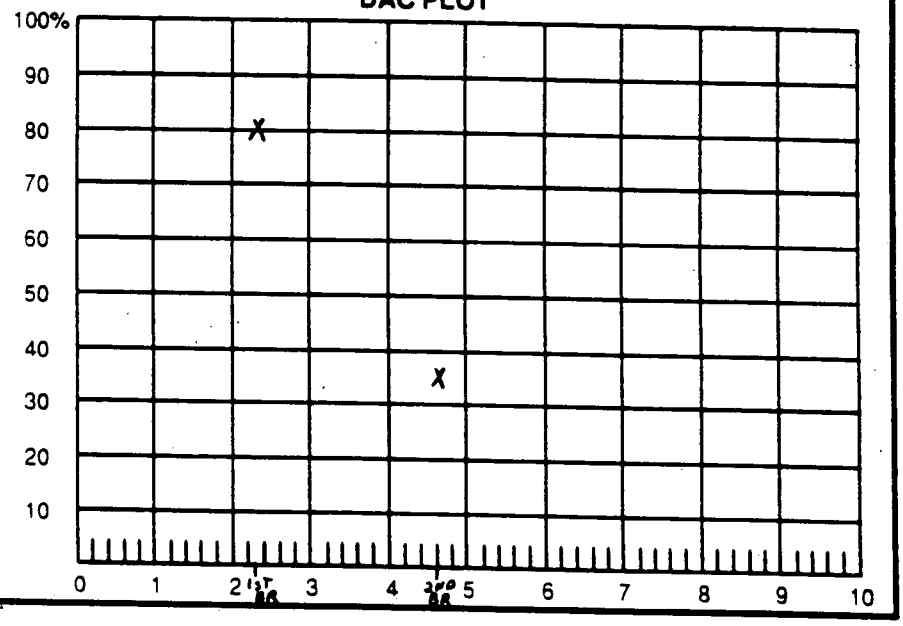
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1050
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1100

REMARKS:

EXAMINERS
1 Tim Adams LEVEL II DATE 10-10-93
2 Steve Wollum LEVEL I DATE 10-10-93

REVIEWERS
1 [signature] LEVEL III DATE 10-10-93
2 Linda S. Weber LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-021
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD 3

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 5.20 Delay 7.56
Range 2.5"
Gain (coarse) = 20 / ±20 dB
Gain (fine) = 12 / ±6 dB
Reference Sensitivity = 32 / ±26 dB
Remarks: N/A

SEARCH UNIT

Serial No. B07680
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 12'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-34
"T" 1.067" Dia. 12"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .25"
Remarks 2.5" SCREEN RANGE

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

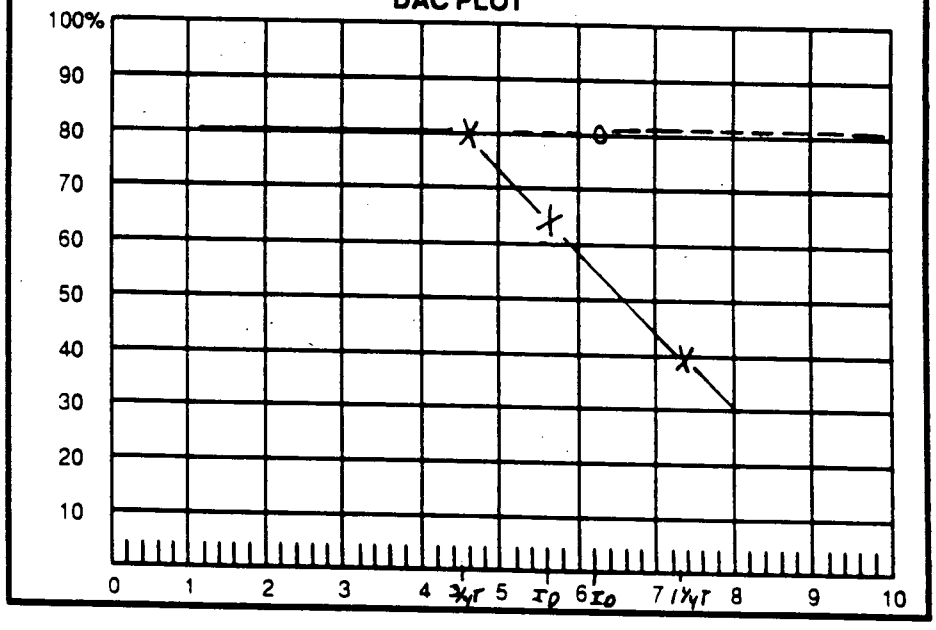
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1030
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1130

REMARKS: X = AXIAL S.D.H
O = CIRC I.D. NOTCH
-12dB TO BRING I.D. NOTCH TO DAC

EXAMINERS	1	Tim Atkinson	LEVEL	II	DATE 10-10-93
	2	Steve Wollum	LEVEL	I	DATE 10-10-93
REVIEWERS	1	Scott Olson	LEVEL	III	DATE 10-10-93
	2	Richard B. Culver	LEVEL	N/A	DATE 10/11/93
	3	R. Palladano	LEVEL	ANII	DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

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PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD 3

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 7.35 Delay 7.42
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 24 / 22 ± dB
Reference Sensitivity = 44 / 42 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 12'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-34
"T" 1.067" Dia. 12"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .4"
Remarks 4" SCREEN RANGE

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

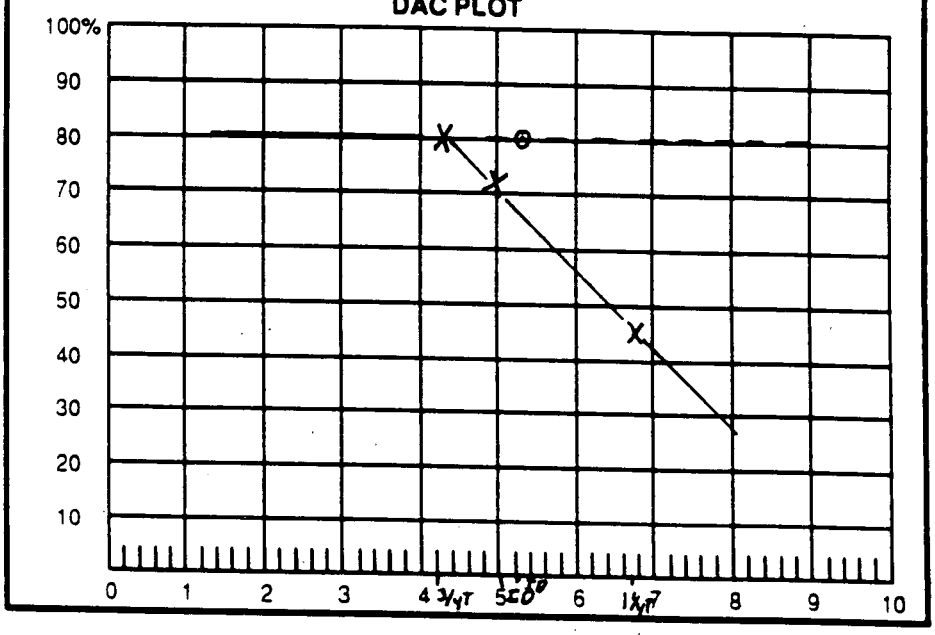
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	1000
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1135

DAC PLOT



REMARKS: X = AXIAL S.D.H
O = CIRC ID NOTCH
-6dB TO BRING I.D. NOTCH TO DAC

EXAMINERS 1 Tim Oldham LEVEL II DATE 10-10-93
2 Steve Wallam LEVEL I DATE 10-10-93
REVIEWERS 1 Scott Lam LEVEL III DATE 10-10-93
2 Richard Weber LEVEL N/A DATE 10/11/93
3 R Valladares LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-021
PAGE 4 OF 5
EXAM -ITEM
CPL-108 WELD 3

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14"-10" PRESS SURGE LINE
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 78 ° F

SCAN 0 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N A

EXAMINERS:
1 Tim Addam LEVEL II DATE 10-10-93
2 Steve Wollum LEVEL I DATE 10-10-93

REVIEWERS:
1 Scott L LEVEL II DATE 10-10-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 R Walladanes LEVEL AN II DATE 10/11/93

NES 9/90 – REV. 1
nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-021
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 1" & 12" PRESS SURGE LINE
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 78 ° F

EXAM ITEM

CPL-108 WELD 3

SCAN 45 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

EXAMINERS:
1 Tim Osborn LEVEL II DATE 10-10-93
2 Steve Wollum LEVEL I DATE 10-10-93

REVIEWERS:
1 Scott Lamm LEVEL III DATE 10-10-93
2 Richard D. Weber LEVEL N/A DATE 10/11/93
3 R P Balbaroso LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1223-022
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-108 WELD 4

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 5.54 Delay 8.12
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 8 dB
Reference Sensitivity 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .5"
Frequency 5 MHz
Mode LONG
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT
"T" 1.25" Dia. 12"
Temperature 78 ° F
Thermometer S/N MR92-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .5"
Remarks 5" SCREEN RANGE

VERTICAL LINEARITY

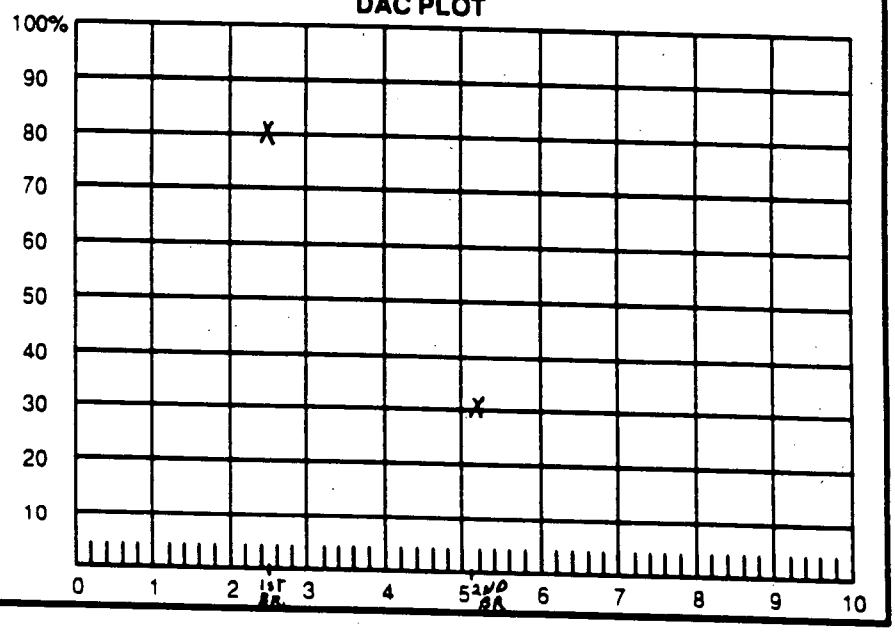
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1050
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1100

REMARKS:

EXAMINERS 1 Tim Adkins LEVEL II DATE 10-10-93
2 Steve Wollum LEVEL I DATE 10-10-93

REVIEWERS 1 Scott Fraser LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 A Wallace LEVEL A&II DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223 - 022
PAGE 2 OF 5
EXAM ITEM

CPL-108 WELD 4

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14"+12" PRESS SURGE LINE
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 78 ° F

SCAN 0 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
☒	N/A	N/A	N/A	☒	N/A	N/A	☒	N/A	☒	☒	N/A

REMARKS:
N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

EXAMINERS:
1 Tim [illegible] LEVEL II DATE 10-10-93
2 Steve Wollum LEVEL I DATE 10-10-93

REVIEWERS:
1 Scott [illegible] LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 [illegible] LEVEL ANII DATE 10/11/93

NES NUCLEAR ENERGY SERVICES, INC.

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PAGE 3 OF 5
CPL-108 REV.0, Weld No.4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-4172
Sweep Length 1.22 Delay 7.62
Range 10
Gain (coarse) 20 ⊥ / 20 ⊥ / 20 = dB
Gain (fine) 12 ⊥ / 18 ⊥ / 26 = dB
Reference Sensitivity 32/38/46 dB
Remarks: N A

SEARCH UNIT

Serial No. D10651
Size .50
Frequency 2.25 MHz
Mode Shear
Nom. Angle 50 °
Measured Angle 46 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .50 To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-36
"T" 1.25 Dia. 14
Temperature 74 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .60
Remarks 6.0" Screen Range N A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

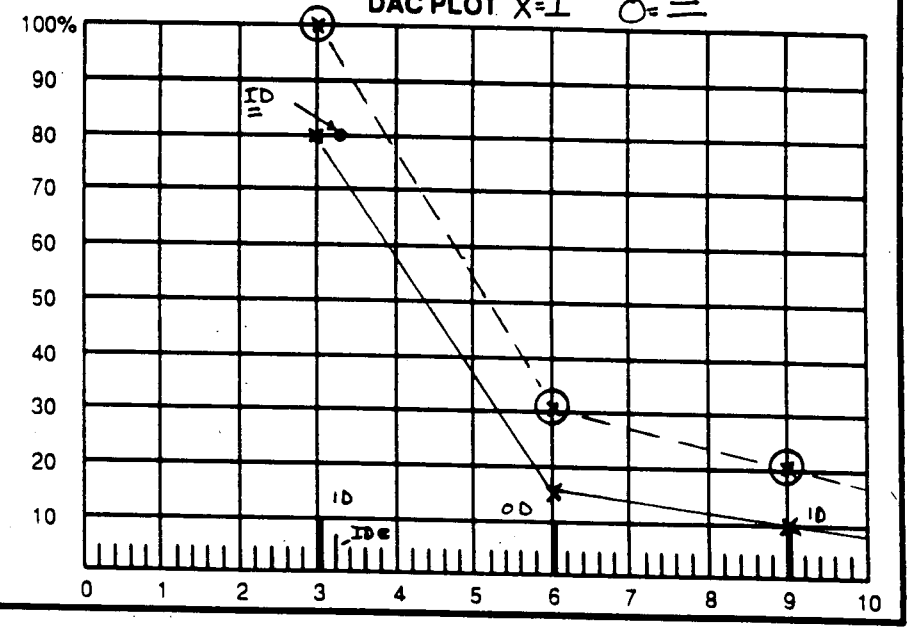
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	78
20	+12	76

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1120
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1147

DAC PLOT X=⊥ O=═



REMARKS: Double DAC---
N A

EXAMINERS 1 [signature] LEVEL III DATE 10/10/93
2 [signature] LEVEL II DATE 10-10-93
REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL A/N DATE 10/11/93

DATA SHEET NO. 1223-022
PAGE 4 OF 5
CPL-108 REV.0, Weld No.4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 3.98 Delay 8.28
Range 10
Gain (coarse) 20 / 20 / 20 = dB
Gain (fine) 22 / 28 / 18 = dB
Reference Sensitivity 42 / 48 / 38 dB
Remarks: N A

SEARCH UNIT

Serial No. B25120
Size .50
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .50 To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-36
"T" 1.25 Dia. 14
Temperature 74 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .75
Remarks 7.5" Screen Range N A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

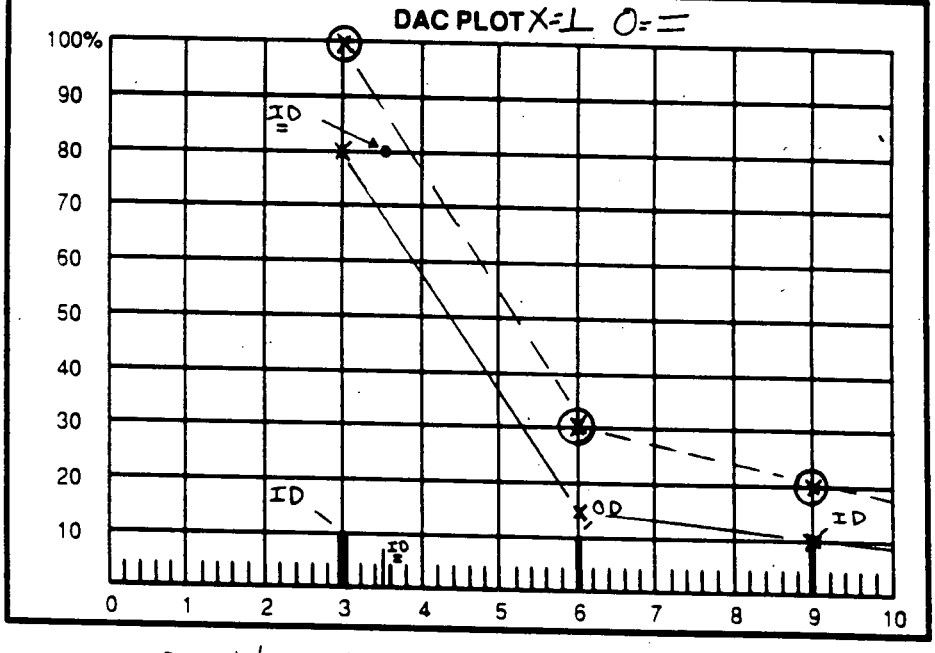
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	22
40	+6	79
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1100
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1150

DAC PLOT X=L O=



REMARKS: Double DAC---
N A

EXAMINERS 1 [signature] LEVEL III DATE 10/10/93
2 [signature] LEVEL II DATE 10-10-93
REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1223-022
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14" & 12" Press. Surge Line
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 78 ° F

EXAM ITEM: Weld No. 4

SCAN 50 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Safe End to Reducer, Complete Reducer Side Only

N A

SCAN 50 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Safe End to Reducer, Complete Both Sides

N A

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Safe End to Reducer, Complete Reducer Side Only

N A

SCAN 60 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Safe End to Reducer, Complete Both Sides

N A

EXAMINERS:
1 [signature] LEVEL III DATE 10/10/93
2 [signature] LEVEL II DATE 10-10-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1223 - 023 (was 022) 10-11-93

PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223

REV. 0

CHANGE NO. N/A

CPL-108 WELD 40M-

INSTRUMENT

Model USK-7

Serial No. 27276-749

Sweep Length 5.54 Delay 8.12

Range 2.5"

Gain (coarse) 20 dB

Gain (fine) 14 dB

Reference Sensitivity 34 dB

Remarks: N/A

SEARCH UNIT

Serial No. M12411

Size .5"

Frequency 5 MHz

Mode LONG

Nom. Angle 0 °

Measured Angle N/A °

Cable Type RG174/U

Cable Length 6'

Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT

"T" 1.4" Dia. 14"

Temperature 78 ° F

Thermometer S/N MR92-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]

Metal Path [X] Depth [N/A]

Each Major Screen Div. = .5"

Remarks 5" SCREEN RANGE

COUPLANT

Brand ULTRAGEL II

Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

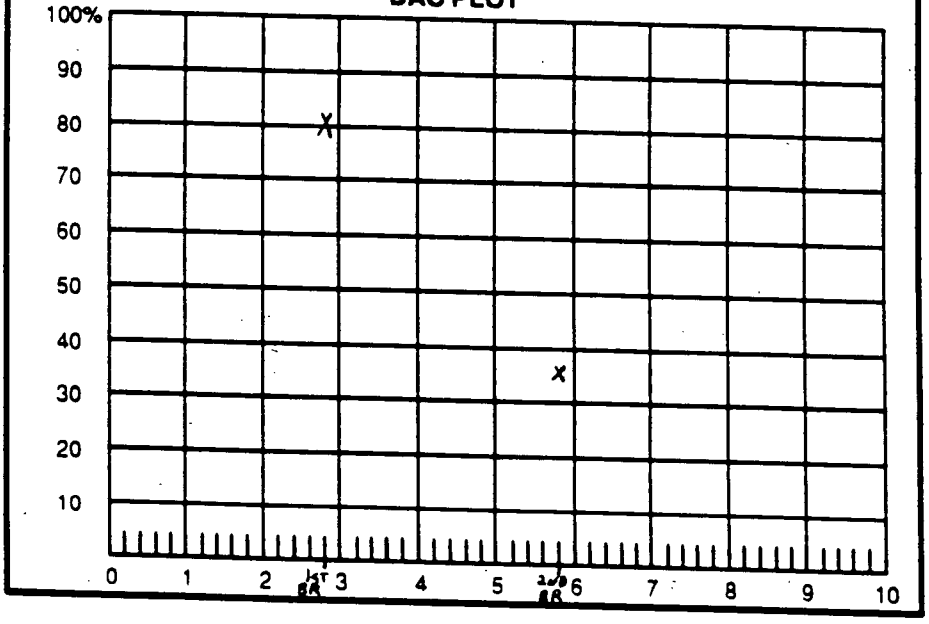
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1050
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1100

DAC PLOT



REMARKS:

EXAMINERS 1 Tim Addison LEVEL II DATE 10-10-93

2 Steve Wollung LEVEL I DATE 10-10-93

REVIEWERS 1 Scott [illegible] LEVEL II DATE 10-11-93

2 [illegible] LEVEL N/A DATE 10/11/93

3 [illegible] LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-023
PAGE 2 OF 5
EXAM ITEM

CPL-108 WELD 4DM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14"+12" PRESS SURGE LINE
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N MR 92-03
COMPONENT TEMP. 78 ° F

SCAN 0 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

EXAMINERS:
1 Tim [illegible] LEVEL II DATE 10-10-93
2 Steve Wollum LEVEL I DATE 10-10-93

REVIEWERS:
1 LEVEL III DATE 10-11-9
2 [illegible] B. Weber LEVEL N/A DATE 10/11/93
3 R Valladares LEVEL ANII DATE 10/11/9

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-023
PAGE 3 OF 5
CPL-108 REV. 0, Weld No. 40M

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-4172
Sweep Length 1.22 Delay 7.62
Range 10
Gain (coarse) 20 ⊥ / 20 ⊥ / 20 = dB
Gain (fine) 12 ⊥ / 18 ⊥ / 26 = dB
Reference Sensitivity 32/38/46 dB
Remarks: N A

SEARCH UNIT

Serial No. D10651
Size .50
Frequency 2.25 MHz
Mode Shear
Nom. Angle 50 °
Measured Angle 46 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .50 To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-36
"T" 1.25 Dia. 14
Temperature 74 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .60
Remarks 6.0" Screen Range N A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

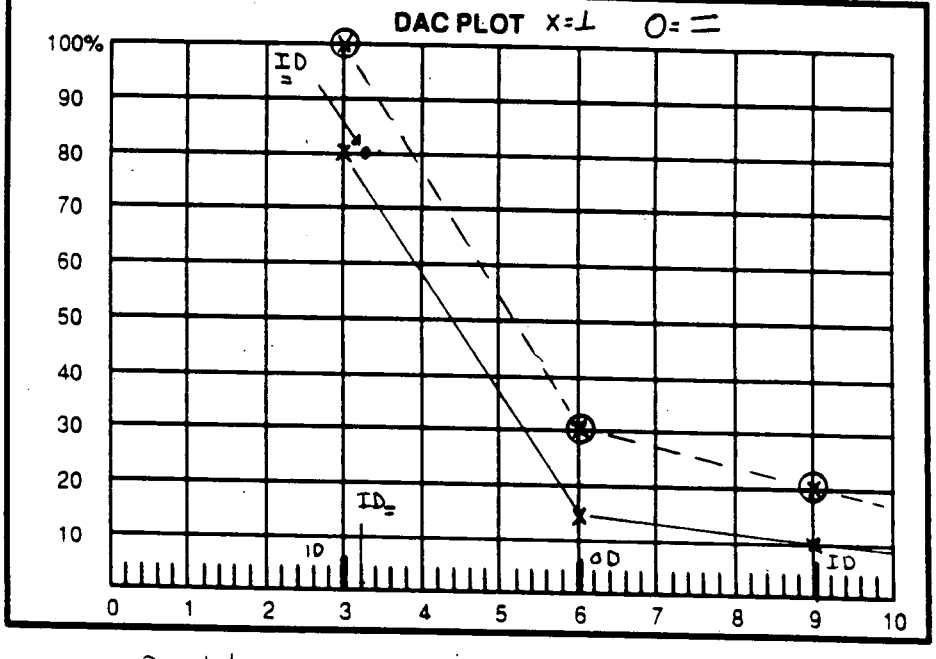
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	78
20	+12	76

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1120
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1147

DAC PLOT X=⊥ O=═



REMARKS: Double DAC---
N A

EXAMINERS 1 [signature] LEVEL III DATE 10/10/93
2 [signature] LEVEL II DATE 10-10-93
REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-C23
PAGE 4 OF 5
CPL-108 REV. 0, Weld No. 4DM

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-3702
Sweep Length 3.98 Delay 8.28
Range 10
Gain (coarse) 20 ⊥ / 20 ⊥ / 20 = dB
Gain (fine) 22 ⊥ / 28 ⊥ / 18 = dB
Reference Sensitivity 42 / 48 / 38 dB
Remarks: N A

SEARCH UNIT

Serial No. B25120
Size .50
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .50 To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-36
"T" 1.25 Dia. 14
Temperature 74 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .75
Remarks 7.5" Screen Range
N A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

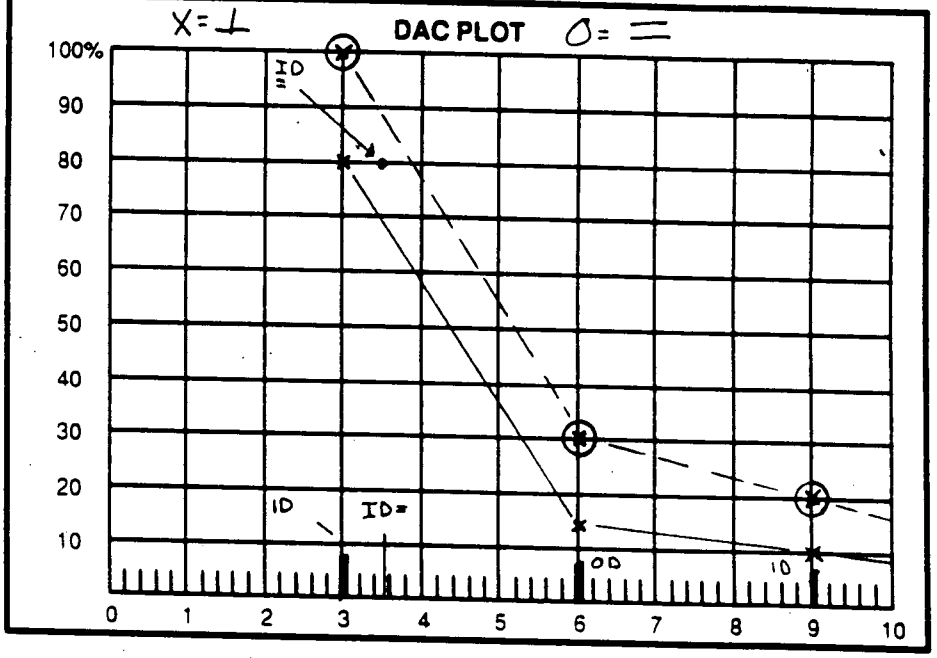
INITIAL	dB	RESULT
80	-6	40
80	-12	22
40	+6	79
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1100
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1150

DAC PLOT

X = ⊥ O = =



REMARKS: Double DAC ---
N A

EXAMINERS 1 [signature] LEVEL III DATE 10/10/93
2 [signature] LEVEL II DATE 10-10-93
REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-023
PAGE 5 OF 5
EXAM ITEM

Weld No. 4 DM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14"x12" Press. Surge Line
ISO/DWG. NO. CPL-108 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 78 ° F

SCAN 50 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Nozzel To Safe End, Limited Safe End Side Only
Note: See previous ISI data (11-29-88) for limitations

N/A

SCAN 60 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: Nozzel To Safe End, Limited Safe End Side Only
Note: See Previous ISI Data (11-29-88) For Limitations

N/A

SCAN N/A ° SCAN dB N/A				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

REMARKS: No 50° or 60° Axial Scans Due To Configuration Limitations. See Previous ISI Data (11-29-88) for Limitations

N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N/A

EXAMINERS:
1 _____ LEVEL III DATE 10/10/93
2 D. Judd LEVEL II DATE 10-10-93

REVIEWERS:
1 _____ LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 _____ LEVEL A/III DATE 10/11/93

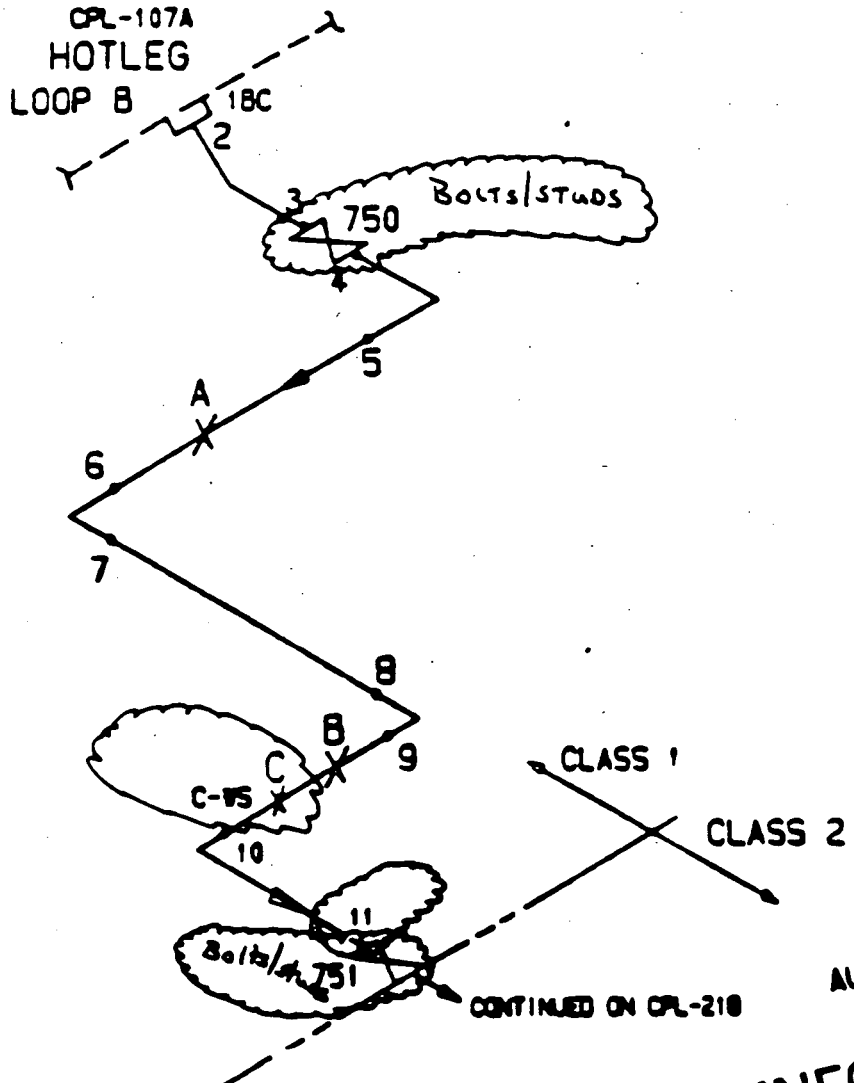
NUCLEAR ENERGY SERVICES, INC.

SPRING HANGERS

A,B

WELDED SUPPORT

C-WS



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-10618 SH.14					
CP & L P.O. No. CPL-51					
CHG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLD	CLD	12/11/92

CPL-109 REV. 0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION LOOP B 14" RHR TAKE-OFF	
LINE NO. 14-RC-1S	CPL-109 REV.

I certify that the image contained on this frame was made

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-003
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: REACTOR COOLANT	Component Name: VALVE BOLTING	Component ID No.: RC-V750
Class: ONE	Location/Isometric: CPL-109 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18 C/O NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	N/A
16 NUTS		✓		✓		✓		✓		✓		✓	✓	N/A
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-21-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: [signature] LII 9-21-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 9/23/93

QA NDE ISI 6, Rev. 1, 07/93

ANII [signature] 9/23/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-004
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: RHR	Component Name: STUDS/NUTS	Component ID No.: V751
Class: 1	Location/Isometric: CPL-109	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 NUTS		✓		✓		✓		✓		✓		✓	✓	
		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
N/A														

Comments/Notes: NO INDICATIONS NOTED

Examiner: Kenneth L. Hance Level: II Date: 9-14-93

Examiner: [signature] Level: II Date: 9-14-93

Comments/Notes:

Reviewed: Scott Hance LTII 9-21-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard A. Weber Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93
ANI [signature] 7/22/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-002
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Reactor Coolant	Component Name: Support/Hanger	Component ID: 109C
Drawing/Location: CPL-109 & R/O 4-9-24-93	/ Reactor Bldg. 240'-Elev. Above Stairs Between B S/G and B Rep	
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

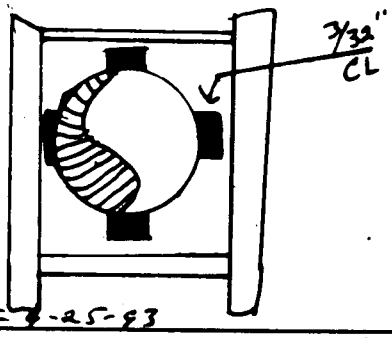
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		See Attached Sheet (page 2 of 2)
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		See Attached Sheet (page 2 of 2)
Abnormal wear			
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		Clearance Required is 1/16 See Sketch Below
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Eugene Sim Level: II Date: 9-24-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Identification not marked on component

Reviewed: Scott Lam 9-25-93

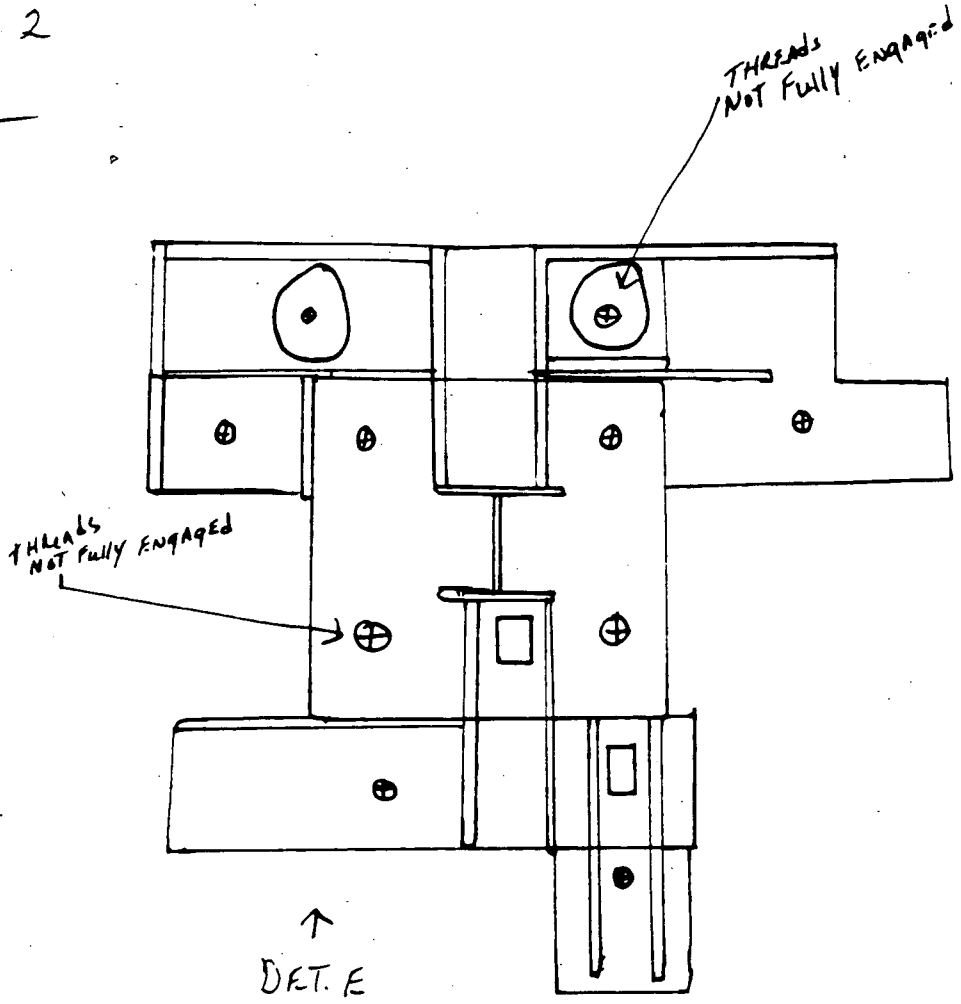
(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

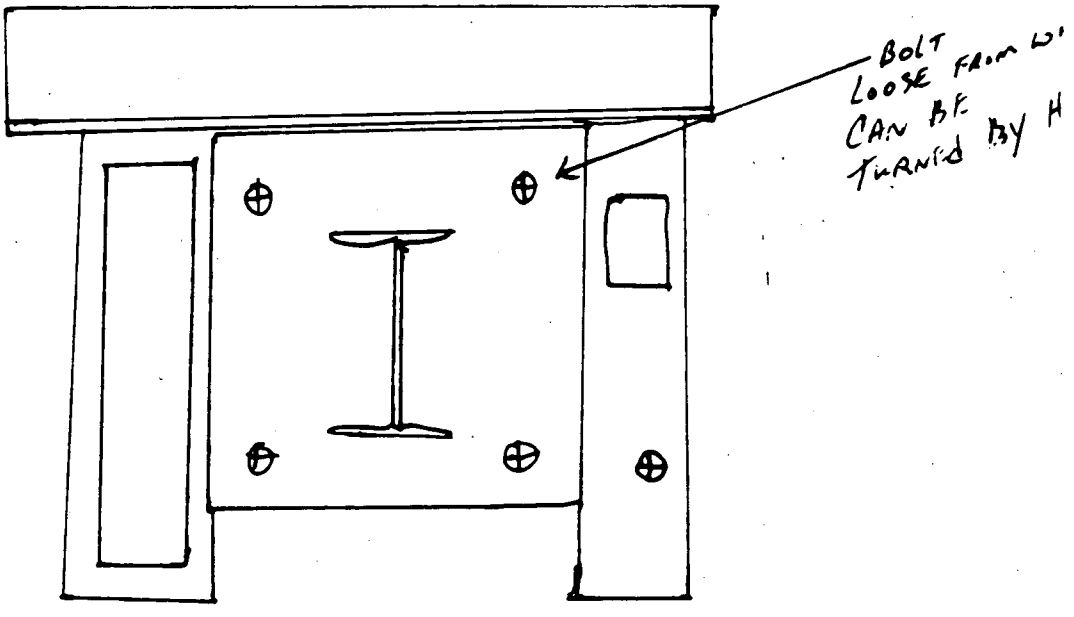
CPL-109 R/C 1230-002

Page 2 of 2

9-24-93



DET. E



DET. C
(RIGHT BASE R)

DATA SHEET NO. 1217-054
THERMOMETER S/N MR92-03
TEMPERATURE 73 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S/S
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. 0
PAGE _____ OF _____

SYSTEM EXAMINED 14" RHR TAKE-OFF ISO/DWG/SK. # CPL-109 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #11	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Arnold A. Lane LEVEL II DATE 10-9-93
EXAMINER Benjamin Sanders LEVEL I DATE 10-9-93
REVIEWER Scott Larson LEVEL III DATE 10-10-93
REVIEWER Richard B. Walker DATE 10/11/93
REVIEWER ANIL R. Palladanis DATE 10/11/93

DATA SHEET NO. 1223-034
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-109 WELD 11

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 5.58 Delay 7.88
Range 2.5"
Gain (coarse) 0 dB
Gain (fine) 24 dB
Reference Sensitivity 24 dB
Remarks: N/A

SEARCH UNIT

Serial No. J10523
Size .5"
Frequency 2.25 MHz
Mode LONG
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT
"T" 1.4" Dia. 14"
Temperature 73 °F
Thermometer S/N MR92-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .5"
Remarks 5" SCREEN RANGE

VERTICAL LINEARITY

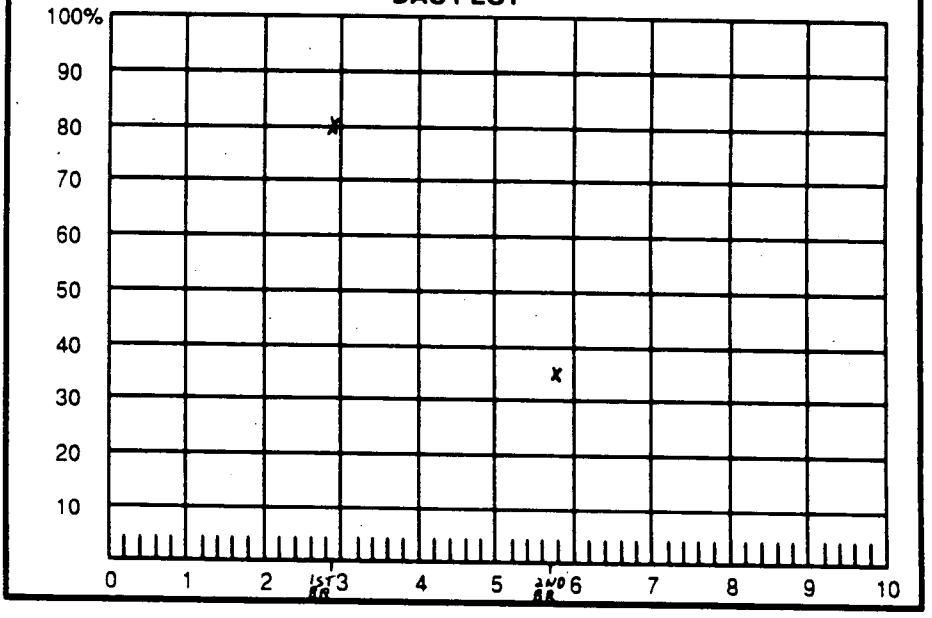
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1205
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1220

REMARKS:

EXAMINERS 1 Tim Oldham LEVEL II DATE 10-9-93
2 Steve Wollam LEVEL I DATE 10-9-93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 Richard D. Weber LEVEL N/A DATE 10/4/93
3 [signature] LEVEL ANII DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-034
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-109 WELD 11

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 8.66 Delay 7.78
Range 2.5"
Gain (coarse) ⊥ 20 / 20 = dB
Gain (fine) ⊥ 8 / 10 = dB
Reference Sensitivity ⊥28 / 30 = dB
Remarks:
N/A

SEARCH UNIT

Serial No. B07680
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-36
"T" 1.2" Dia. 14"
Temperature 85 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .6"
Remarks 6" SCREEN RANGE
N/A

VERTICAL LINEARITY

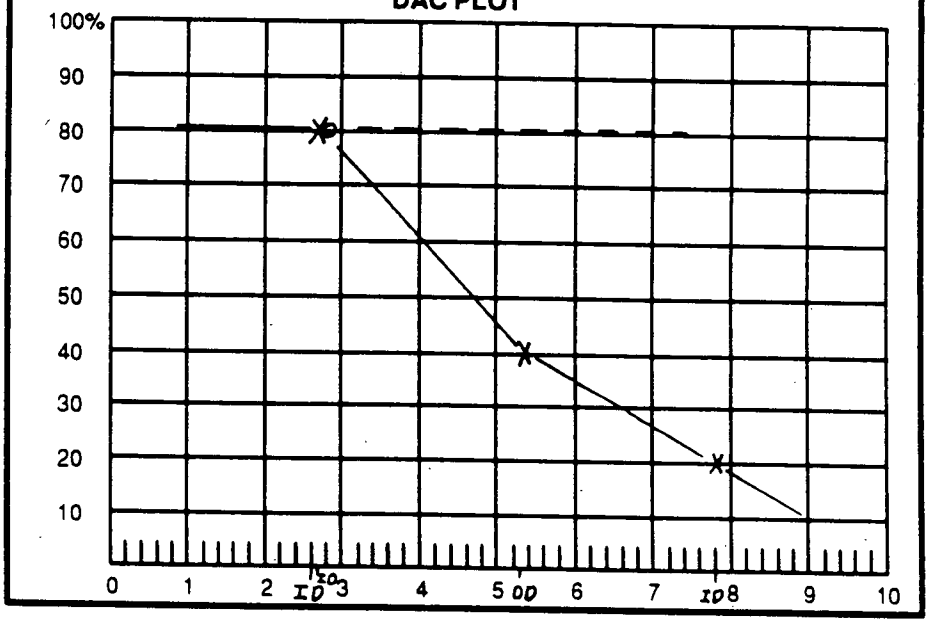
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	0900
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1130

REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS 1 Tim Ashburn LEVEL II DATE 10-9-93
2 Steve Wollum LEVEL I DATE 10-9-93
REVIEWERS 1 Scott Lewis LEVEL III DATE 10-11-93
2 Richard B Weber LEVEL N/A DATE 10/11/93
3 A Palladares LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-034
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-109 WELD 11

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 9.22 Delay 290
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 22 / 28 ± dB
Reference Sensitivity = 42 / 48 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. M15116
Size 5"
Frequency 1.5 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-36
"T" 1.2" Dia. 14"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .8"
Remarks 8" SCREEN RANGE N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

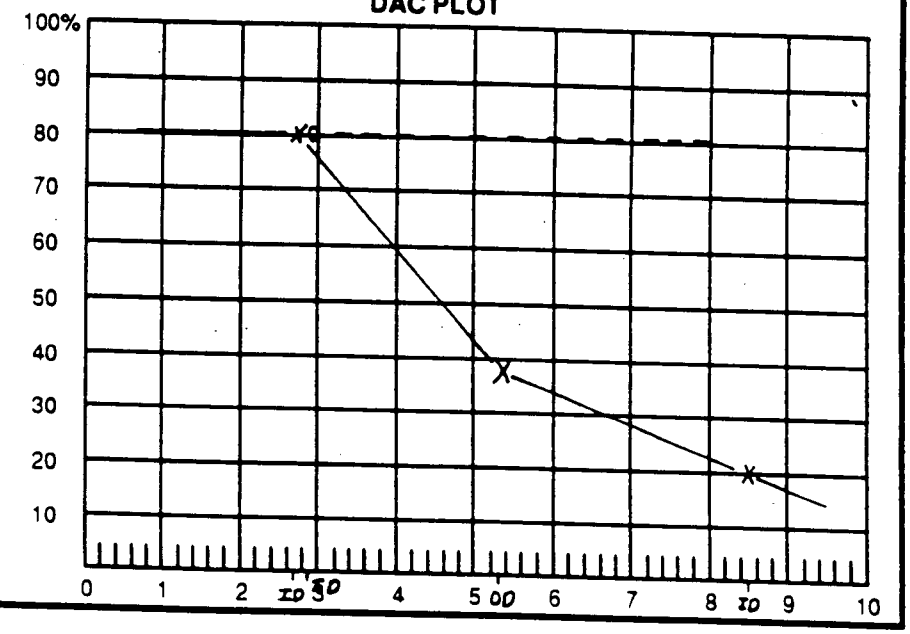
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1000
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1155

DAC PLOT



REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS 1 Tom Jackson LEVEL II DATE 10-9-93
2 Steve Wollyon LEVEL I DATE 10-9-93
REVIEWERS 1 Scott Lum LEVEL III DATE 10-11-93
2 Richard S. Wilson LEVEL N/A DATE 10/11/93
3 R Balladares LEVEL AWS II DATE 10/12/93

DATA SHEET NO. 1223-034

PAGE 4 OF 5

EXAM. ITEM

WELD 11

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP B 14" RHR

ISO/DWG. NO. CPL-109 REV. 0

THERMOMETER S/N MR92-03

COMPONENT TEMP. 73 ° F

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE. PIPE SIDE ONLY.

SCAN 45 ° SCAN dB 70				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE SIDE ONLY.

SCAN 60 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE. PIPE SIDE ONLY.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE SIDE ONLY.

EXAMINERS:

1 Tim Adams LEVEL II DATE 10-9-93

2 Steve Wollum LEVEL I DATE 10-9-93

REVIEWERS:

1 [signature] LEVEL III DATE 10-11-93

2 [signature] LEVEL N/A DATE 10/11/93

3 [signature] LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-034
PAGE 5 OF 5
EXAM ITEM
WELD 11

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP B 14" RHR
ISO/DWG. NO. CPL-109 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 73 ° F

SCAN 0 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
☒	N/A	N/A	N/A	☒	N/A	N/A	☒	N/A	☒	☒	N/A

REMARKS: Pipe Side Only

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

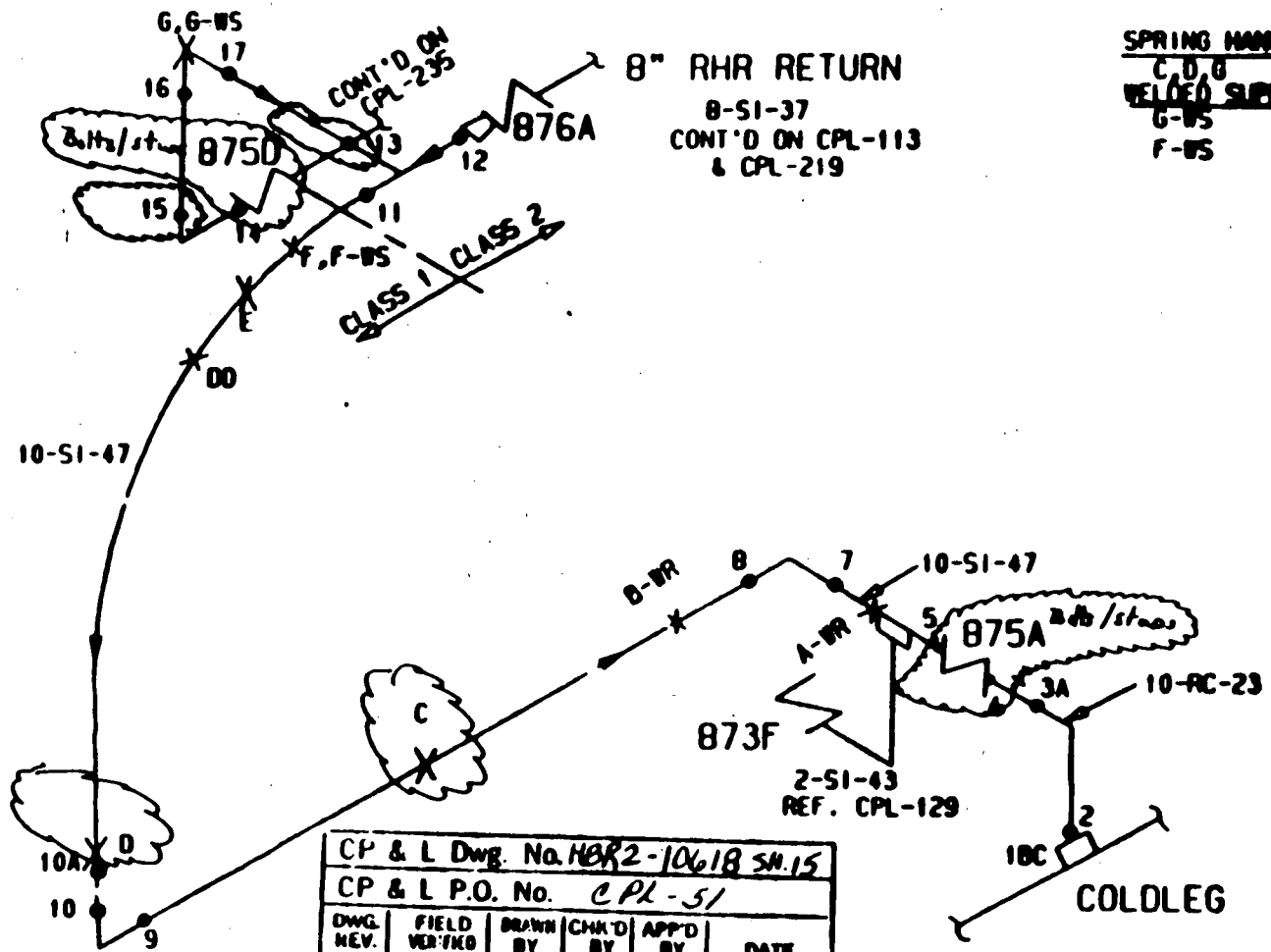
SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

EXAMINERS:
1 Tim Oddsen LEVEL II DATE 10 : 93
2 Steve Wollum LEVEL I DATE 10-9-93

REVIEWERS:
1 LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 LEVEL ANII DATE 10/12/93

nes NUCLEAR ENERGY SERVICES, INC.



SPRING HANGERS
C.D.G
WELDED SUPPORTS
G-WS
F-WS

INFO ONLY
AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH.15					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/09

CPL-110 REV. 0

H. B. ROBINSON S. E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION: LOOP A TO ACCUM. DISCHG. LINE	

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-C3(
Page 1 of 1
PSI☐ ISI☒

Project Job No.

System: SI	Component Name: VARIABLE SUPPORT	Component ID: 11C C
Drawing/Location: CPL 11C R/C / Rx Bldg. NEXT TO RCP A @ 245'-8 7/16" LEVEL (ELEVATION)		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Constant Support ☐ Mechanical Snubber ☒ Variable Support ☐ Support/Hanger	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2475 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

Reviewed: [signature] LEVEL III 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-006
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: ~~SI~~ SAFETY INJECTION (S 9-21-93)	Component Name: VARIABLE SUPPORT	Component ID: 110-D
Drawing/Location: CPL-11C R/C		
☒ VT-3 Procedure: SP-1230 Rev. C	☒ VT-4 Procedure: N/A	Rev. N/A
Direct ☑ Remote ☐	Video Recording No.: N/A	☐ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

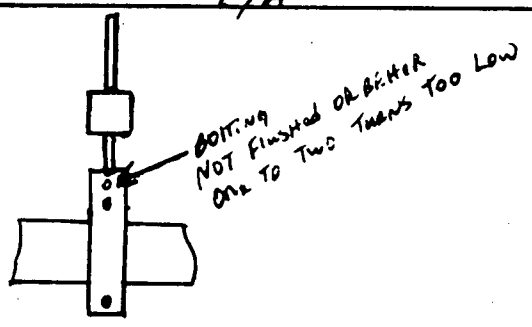
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		LACK OF FULL THREAD ENGAGEMENT
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 3000 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-21-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: [signature] Date: 9/23/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-005
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: Safety ~~Spray~~ Injection SI-7243	Component Name: VALVE BOLTING	Component ID No.: SI-V875A
Class: ONE	Location/Isometric: CPL-110 R/C	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: 18% Neutral Gray Card / Flashlight		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 Studs	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 Nuts		✓		✓		✓		✓		✓		✓	✓	
16 Washers		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-21-93

~~Reviewed~~ Examiner: [signature] Level: III Date: 9-23-93

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 9/23/93

QA NDE ISI 6, Rev. 1, 07/93

ANII [signature] 9/23/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-006
Page 1 of 1

Project HBR Job No. Unit 1☐ 2☒

System: SI	Component Name: Check Valve	Component ID No.: 875 D
Class: 1	Location/Isometric:	CPL-110
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: Flashlight 18% neutral gray card		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
Studs 1-16	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
Nuts/Washers 1-16	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A

Comments/Notes: Studs, nuts, washers in place. No indications.

Examiner: Scott Lawson Level: III Date: 9-19-93

Examiner: Level: Date:

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 9/23/93

QA NDE ISI 6, Rev. 1, 07/93

HNP-M Wallaceburg 9/23/93

DATA SHEET NO. 1217-006
THERMOMETER S/N JL91-03
TEMPERATURE 105 ° F
NOMINAL THICKNESS 1 INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 482Y
PAGE 1 OF 1

SYSTEM EXAMINED LOOP A 10" ACCUM DISCHG LINE ISO/DWG/SK. # CPL-110 REVISION 0

DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 13	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-21-93
EXAMINER Benjamin Sanders LEVEL I DATE 9/21/93
REVIEWER Scott Larson LEVEL III DATE 9-21-93
REVIEWER Richard B. Weber DATE 9/22/93
REVIEWER R P Valladares ANII DATE 923.93

DATA SHEET NO. 1217-005
THERMOMETER S/N SL 91-03
TEMPERATURE 85 ° F
NOMINAL THICKNESS 1 INCHES
MATERIAL 5/S
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOOP A 10" ACCUM. DISCHG. LINE ISO/DWG/SK. # CPL-110 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #15	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-21-93
EXAMINER [illegible] LEVEL I DATE 9/21/93
REVIEWER [illegible] LEVEL III DATE 9-21-93
REVIEWER Richard B. Weber DATE 9/23/93
REVIEWER ANIL R. Valladares DATE 9/23/93

DATA SHEET NO. 1223-001
PAGE 1 OF 6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL 110 WELD #13

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 4.30 Delay 8.08
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 16 dB
Reference Sensitivity 36 dB
Remarks: N/A

SEARCH UNIT

Serial No. J10523
Size .5"
Frequency 2.25 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG-174
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-110 WELD 13
"T" 1.10" Dia. 10"
Temperature 105 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .4"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

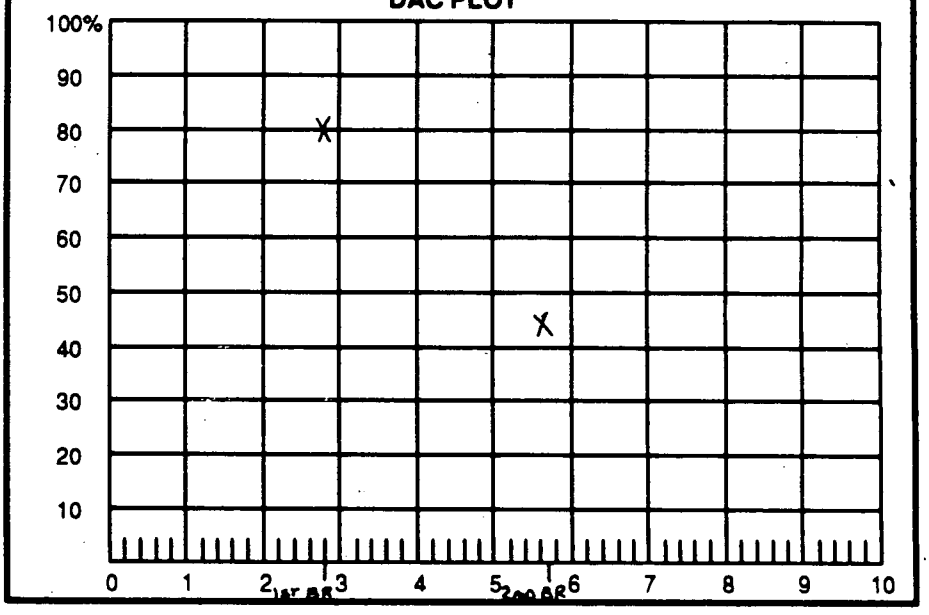
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1345
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1400

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/21/93
2 [signature] LEVEL II DATE 9/21/93

REVIEWERS 1 [signature] LEVEL III DATE 9-25-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL ANII DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-001
PAGE 2 OF 6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

WELD #13 CPL-110

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 0.68 Delay 7.75
Range 10
Gain (coarse) 0 dB
Gain (fine) 22 dB
Reference Sensitivity 22 dB
Remarks: REFERENCE SENSITIVITY CIRC. SCAN = 28 DB

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG-174
Cable Length 6'
Remarks: EXIT POINT TO FRONT OF WEDGE = .5"

CALIBRATION BLOCK

No. CPL/59
"T" 1.10" Dia. 10"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

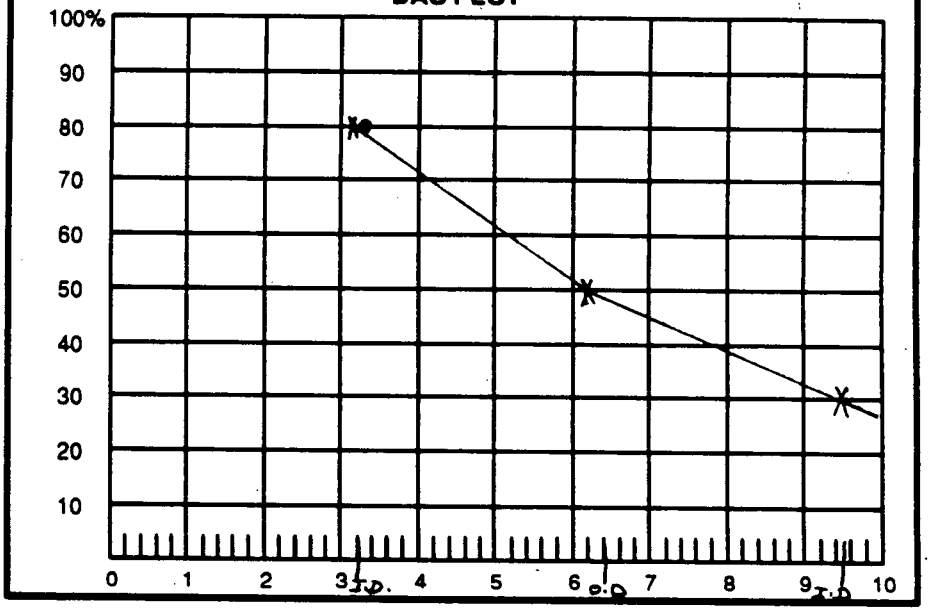
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	75
20	+12	72

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1315
INTERMEDIATE	/
INTERMEDIATE	N/A
INTERMEDIATE	/
FINAL CAL.	1610

DAC PLOT



REMARKS: ● = CIRC. SCAN I.D. NOTCH
X = AXIAL SCAN

EXAMINERS 1 [signature] LEVEL III DATE 9-21-93
2 [signature] LEVEL II DATE 9-21-93
REVIEWERS 1 [signature] LEVEL III DATE 9-24-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL AN II DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-001
PAGE 3 OF 6

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Safety Injection
ISO/DWG. NO. CPL-110 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 105 ° F

EXAM ITEM

WELD #13 CPL-110

SCAN 0 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: 0° BASE MATERIAL EXAM

SCAN 45 ° SCAN dB 28				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO TEE. COMPLETE FROM PIPE SIDE.

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO TEE. COMPLETE BOTH SIDES.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 [signature] LEVEL III DATE 9/21/93
2 David W Martin LEVEL II DATE 9/21/93

REVIEWERS:
1 [signature] LEVEL III DATE 9-25-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL AWS II DATE 9/29/93

DATA SHEET NO. 1223-001
PAGE 4 OF ~~3~~ 6 9-25-93

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-110 WELD #13

INSTRUMENT

Model Krautkramer USK7
Serial No. 27276-3784
Sweep Length 4.80 Delay 8.06
Range 10"
Gain (coarse) 20 dB
Gain (fine) 14 dB
Reference Sensitivity 34 dB
Remarks: N/A

SEARCH UNIT

Serial No. E20000
Size 0.5"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 58 °
Cable Type RG174/U
Cable Length 1 x 6'
Remarks: 0.58" From Exit Point to Wedge Tip
N/A

CALIBRATION BLOCK

No. CPL-59
"T" 1.1" Dia. N/A
Temperature 94 °F
Thermometer S/N MR92-03

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

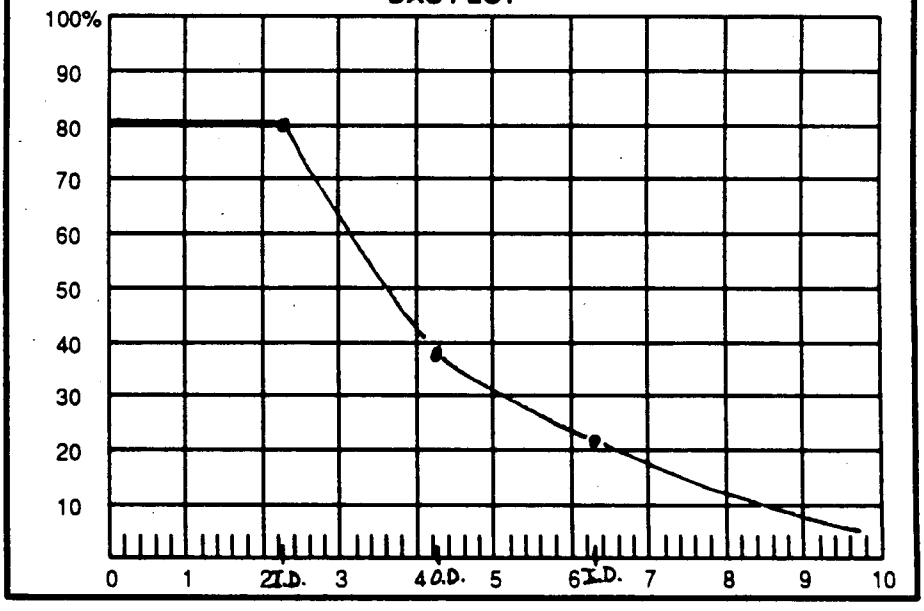
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	79
20	+12	76

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1200
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1605

REMARKS: N/A

EXAMINERS	1 Chris D. Judd/CD Judd	LEVEL	II	DATE	9-23-93
	2 Benjamin Sanders	LEVEL	II	DATE	9-23-93
REVIEWERS	1 Scott Hay	LEVEL	III	DATE	9-23-93
	2 Richard D. Weber	LEVEL	N/A	DATE	9/29/93
	3 R. Wallace Davis	LEVEL	ANII	DATE	9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-001
PAGE 25 OF 1254 36

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-110 Weld # 13

INSTRUMENT

Model KrautKramer USK 7
Serial No. 27276-784
Sweep Length 8.12 Delay 7.58
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 16 dB
Reference Sensitivity 36 dB
Remarks: N/A

SEARCH UNIT

Serial No. E20000
Size 0.5"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 58 °
Cable Type RG174/U
Cable Length 1 x 6'
Remarks: 0.58" From Exit Point to Wedge Tip
N/A

CALIBRATION BLOCK

No. CPL-59
"T" 1.1 Dia. N/A
Temperature 94 °F
Thermometer S/N MR92-03

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 0.5
Remarks N/A

COUPLANT

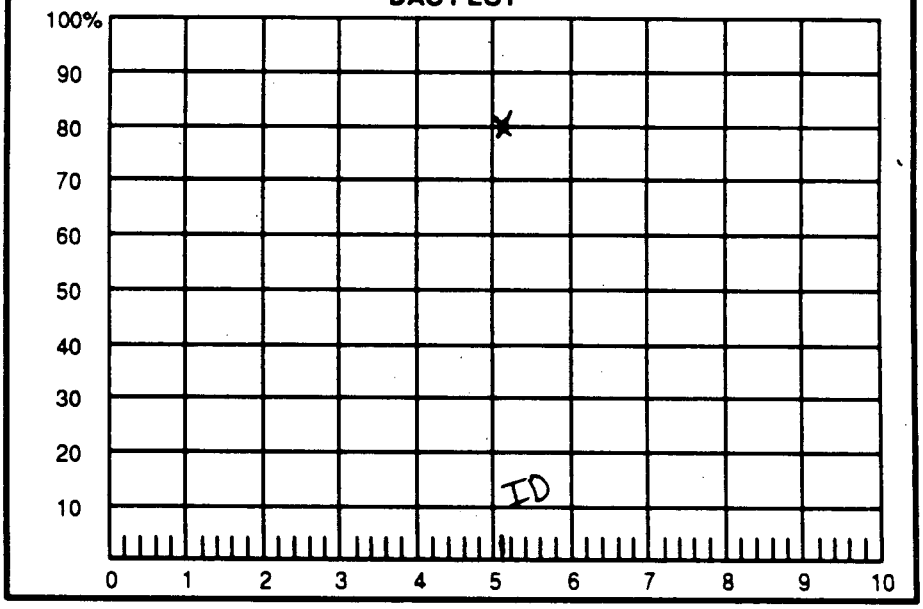
Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	77
20	+12	74

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1200
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1600

REMARKS: N/A

EXAMINERS 1 Chris D. Judd / Ch D. Judd LEVEL II DATE 9-23-93
2 Benjamin Sanders LEVEL II DATE 9-23-93

REVIEWERS 1 Scott Lamm LEVEL III DATE 9-24-93
2 Richard Schuyler LEVEL N/A DATE 9/29/93
3 R Wallace Jones LEVEL ANII DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-001

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP A 10" ACCUM. DISCHG. LINE

ISO/DWG. NO. CPL-110 REV. 0

THERMOMETER S/N MR92-03

COMPONENT TEMP. 87 ° F

EXAM ITEM

WELD # 13

SCAN 58 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 58 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:

1 Chris D. Judd/Chris D. Judd LEVEL II DATE 9-23-93

2 Benjamin Sands LEVEL II DATE 9-23-93

REVIEWERS:

1 [signature] LEVEL III DATE 9-24-93

2 [signature] LEVEL N/A DATE 9/29/93

3 _____ LEVEL _____ DATE _____

DATA SHEET NO. 1223-002
PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-110 WELD #15

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 4.30 Delay 8.08
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 16 dB
Reference Sensitivity 36 dB
Remarks: N/A

SEARCH UNIT

Serial No. J10523
Size .5"
Frequency 2.25 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG174
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-110 WELD 15
"T" 1.10" Dia. 10
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .4"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

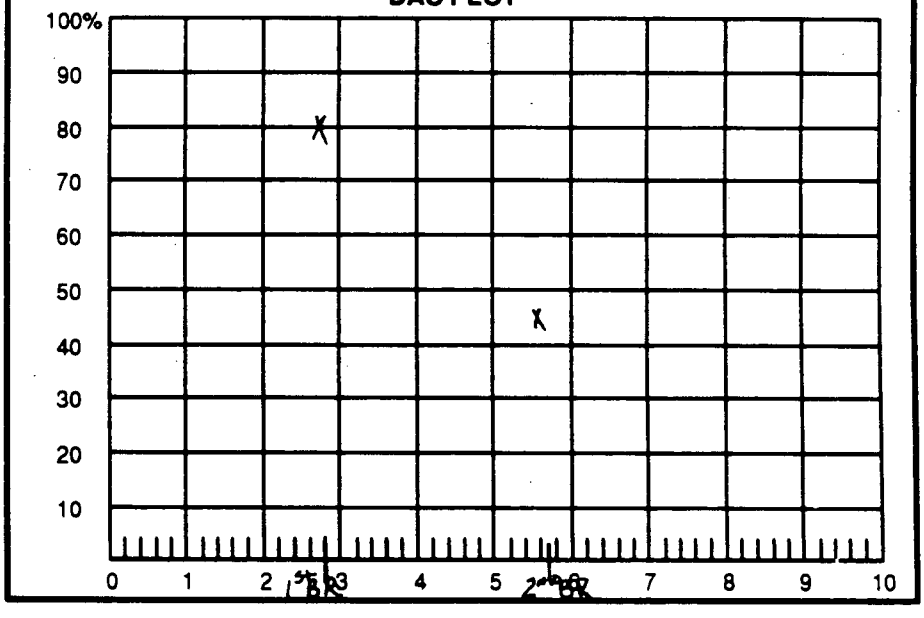
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1405
INTERMEDIATE	\
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1415

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/21/93
2 David H Martin LEVEL II DATE 9/21/93
REVIEWERS 1 Scott [illegible] LEVEL III DATE 9-25-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL ANII DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-002
PAGE 2 OF 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

WELD #LS CPL-110

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 0.68 Delay 7.75
Range 10"
Gain (coarse) 0 dB
Gain (fine) 22 dB
Reference Sensitivity 22 dB
Remarks: CIRC. SCAN REFERENCE SENSITIVITY = 28 dB

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45° °
Measured Angle 45° °
Cable Type RG-174
Cable Length 6'
Remarks: Exit Point to Front of Wedge .5"

CALIBRATION BLOCK

No. CPL 159
"T" 1.10" Dia. 10"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

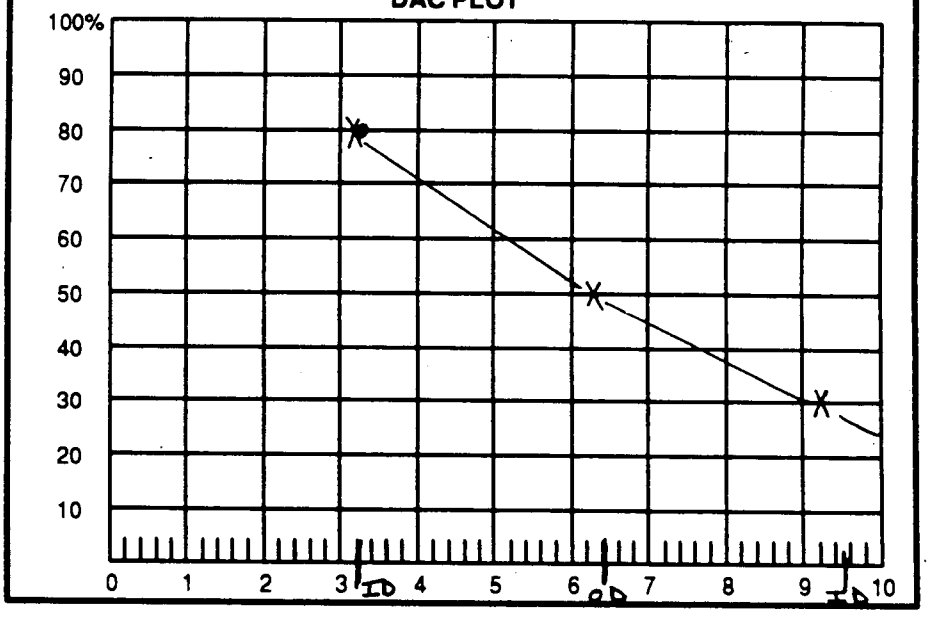
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	75
20	+12	72

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1315
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1610

DAC PLOT



REMARKS: ● = CIRC. SCAN I.D. NOTCH
X = Ax Scan

EXAMINERS 1 [signature] LEVEL III DATE 9-21-93
2 [signature] LEVEL II DATE 9-21-93
REVIEWERS 1 [signature] LEVEL III DATE 9-21-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL AWII DATE 9/28/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-002
PAGE 3 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Safety Injection
ISO/DWG. NO. CPL-110 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 85 ° F

EXAM ITEM

WELD #15 CPL-110

SCAN 0 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: 0° BASE MATERIAL EXAM

SCAN 45 ° SCAN dB 28				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: ELBOW TO PIPE. COMPLETE BOTH SIDES.
PERFORMED 1½V EXAMS DUE TO WELD CROWN CONFIGURATION.

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: ELBOW TO PIPE. COMPLETE BOTH SIDES.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 [signature] LEVEL III DATE 9/21/93
2 [signature] LEVEL II DATE 9/21/93

REVIEWERS:
1 [signature] LEVEL III DATE 9-25-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL ANII DATE 9/29/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-002
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SL 9-25-93

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-110 WELD #15

INSTRUMENT

Model KRAUTKRAMER - USK7
Serial No. 27276-784
Sweep Length B12 Delay 7.58
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 12 dB
Reference Sensitivity 32 dB
Remarks: N/A

SEARCH UNIT

Serial No. E20000
Size 0.5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 58 °
Cable Type RG174/U
Cable Length 1 x 6'
Remarks: 0.58" FROM EXIT PT. TO WEDGE TIP
N/A

CALIBRATION BLOCK

No. CPL-59
"T" 1.1 Dia. N/A
Temperature 94 ° F
Thermometer S/N MR92-03

CALIBRATION

0° N/A Axial X Circ. N/A
Metal Path X Depth N/A
Each Major Screen Div. = 0.5
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

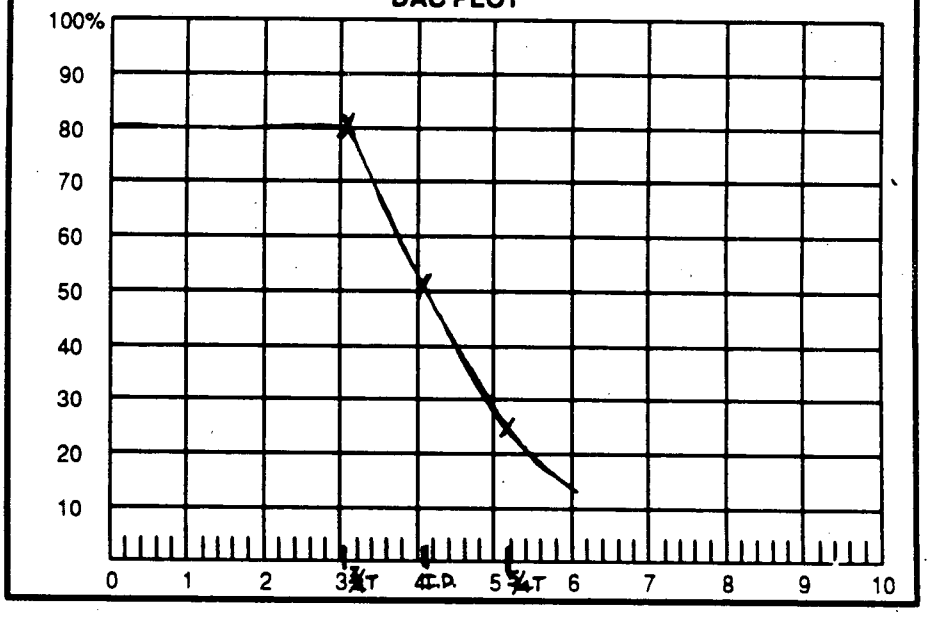
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	77
20	+12	74

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1200
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1600

REMARKS: -4dB TO BRING THE I.D. NOTCH TO DAC LINE.
N/A

EXAMINERS	1 Chris D. Judd / Ch D. Judd	LEVEL	II	DATE	9-23-93
	2 Benjamin Sander	LEVEL	II	DATE	9-23-93
REVIEWERS	1 [signature]	LEVEL	III	DATE	9-25-93
	2 [signature]	LEVEL	N/A	DATE	9/29/93
	3 [signature]	LEVEL	9/29/93 AN/I AN 9 2993	DATE	9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-002
PAGE 25 OF 48
SL 9-25-93

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-110 WELD #15

INSTRUMENT

Model Krautkramer USK 7
Serial No. 27276-784
Sweep Length 8.12 Delay 7.58
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 16 dB
Reference Sensitivity 36 dB
Remarks: N/A

SEARCH UNIT

Serial No. E20000
Size 0.5"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 58 °
Cable Type RG174/U
Cable Length 1 x 6'
Remarks: 0.58" From Exit Point to Wedge Tip
N/A

CALIBRATION BLOCK

No. CPL-59
"T" 1.1" Dia. N/A
Temperature 94 ° F
Thermometer S/N MR92-03

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 0.5
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

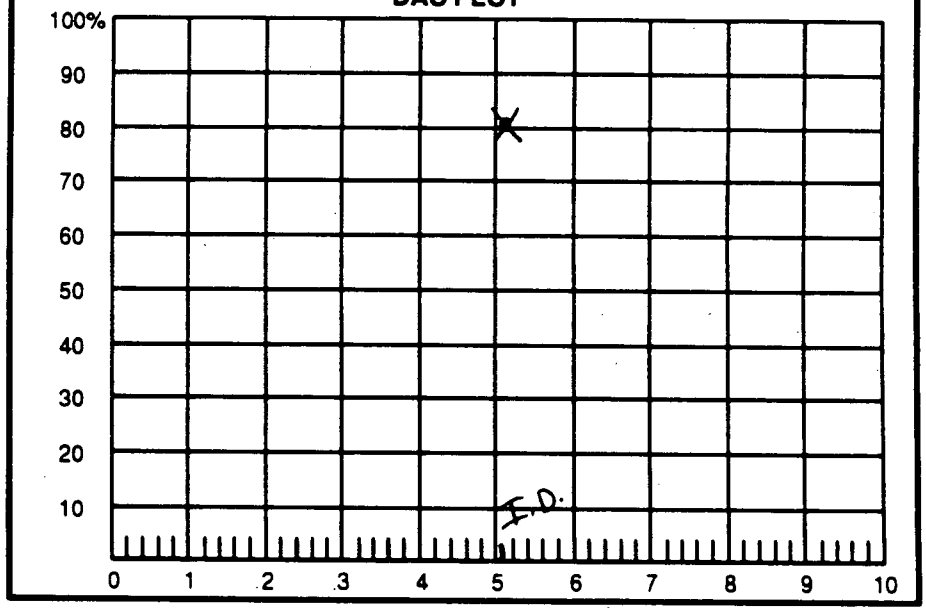
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	77
20	+12	74

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1200
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1600

REMARKS: N/A

EXAMINERS	1 Chris D. Judd/Cl D. Judd	LEVEL II	DATE 9-23-93
	2 Benjamin Sagan	LEVEL II	DATE 9-23-93
REVIEWERS	1 Scott Lum	LEVEL III	DATE 9-25-93
	2 Gustavo Gutierrez	LEVEL N/A	DATE 9/29/93
	3 R Wallaanes	LEVEL ANII	DATE 9/29/93

DATA SHEET NO. 1223-002
PAGE 6 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP A TO ACCUM DISCHG. LINE
ISO/DWG. NO. CPL-110 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 78 ° F

EXAM ITEM

WELD # 15

SCAN 58 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: 360° INTERMITTENT ROOT, SEE ATTACHED

N/A

SCAN 58 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Chris D. Judd/Ch D. Judd LEVEL II DATE 9-23-93
2 Benjamin Sander LEVEL II DATE 9-23-93

REVIEWERS:
1 Scott Lamm LEVEL III DATE 9-25-93
2 Richard Bisbee LEVEL N/A DATE 9/29/93
3 R P Wallace LEVEL ASNT DATE 9/29/93

EXAM ITEM

Weld No. 15

ISO/DWG. NO.

CPL-110 Rev. 0

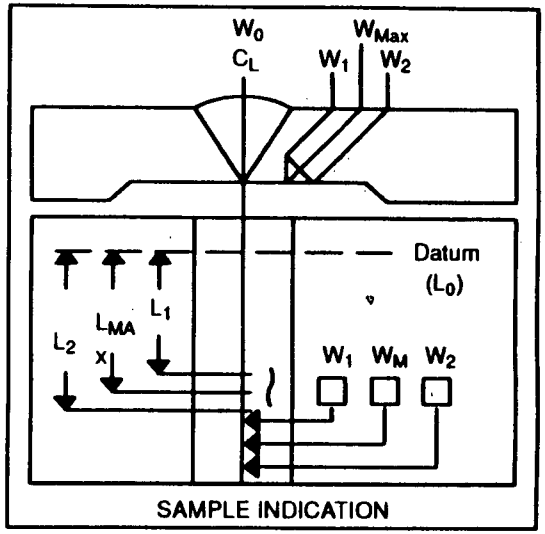
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 223-002

PAGE 7 OF 8

SEARCH UNIT ANGLE 58 ° W_0 LOCATION Weld Center Line L_0 LOCATION Extradose



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	50%	1.7	2.1	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	D.S.	360° Intermittent Root
													See Attached
						N							N
						A							A

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Chris O. Judd/CL O. Judd LEVEL II DATE 9-23-93

2 Benjamin Snyder LEVEL II DATE 9-23-93

REVIEWERS 1 Scott Lamm LEVEL III DATE 9-25-93

2 Richard Bilheber LEVEL N/A DATE 9/29/93

3 R Valladares LEVEL ANI DATE 9/29/93

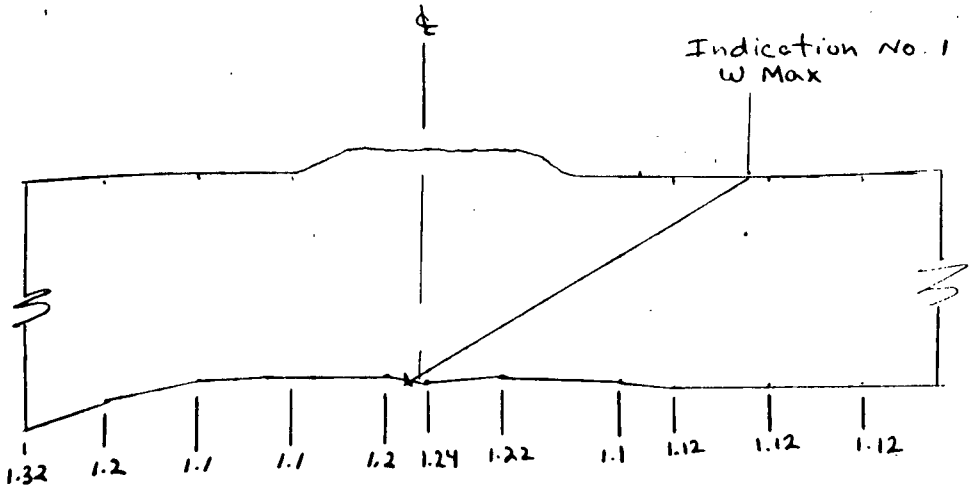
NUCLEAR ENERGY SERVICES, INC.

NES 990

Date Sht. 1223-002

Weld No. 15
CPL-110 Rev. 0

Down Stream



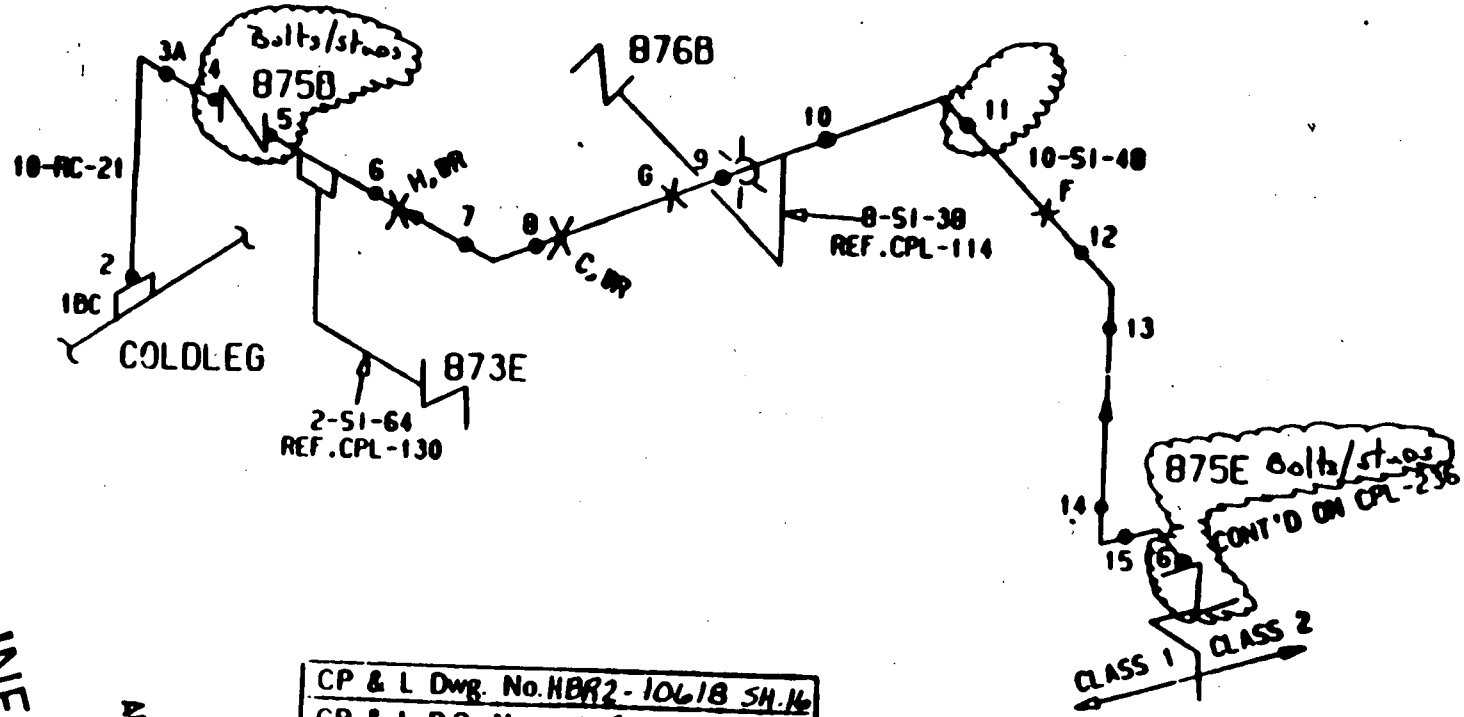
EXAMINERS 1. Chris D. Judd / Ch D. Judd LEVEL II DATE 9-23-93
2. Benjamin Sanders LEVEL II DATE 9-23-93

Reviewed: Scott Lamm LEVEL III 9-25-93

58°
2.1" SP
1.7 Sur. P.
50% DAC

SL 9-25-93

SPRING NUMBERS
6



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH.16					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPSL	CLO	CLO	12/11/89

CPL-111 REV. 0

H. B. ROBINSON S. E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION: LOOP B 10" ACCUM. DISCHG. LINE	
LINE NO. 10-SI-46 CPL-111 REV.	

I certify that the data contained on this form was supplied by the construction and that the data is correct to the best of my knowledge.

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-007
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: SAFETY ~~Stat~~ INJECTION 9 SP-21-93	Component Name: VALVE BOLTING	Component ID No.: SI-V875B
Class: ONE	Location/Isometric: CPL-111 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 NUTS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 STUDS		✓		✓		✓		✓		✓		✓	✓	
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-21-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 9/23/93

QA NDE ISI 6, Rev. 1, 07/93

ANI [signature] 9/23/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-008
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: Safety Injection	Component Name: VALVE BOLTING	Component ID No.: VSI-875E
Class: ONE	Location/Isometric: CPL-111 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 NUTS		✓		✓		✓		✓		✓		✓	✓	
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
		↓		↓		↓		↓		↓		↓	↓	↓

Comments/Notes:

NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-20-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Walladares 9-23-93

DATA SHEET NO. 1217-030
THERMOMETER S/N MR92-04
TEMPERATURE 84 ° F
NOMINAL THICKNESS 1.125 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Loop B-10" Accum. Discha ISO/DWG/SK. # CPL-111 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 11	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Todd/CJ D. Todd LEVEL II DATE 9-28-93
EXAMINER [signature] LEVEL I DATE 9-28-93
REVIEWER [signature] LEVEL III DATE 9-29-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANTI P. Balladares DATE 9/29/93

DATA SHEET NO. 1223-006
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

111-11

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 5.50 Delay 8.44
Range 2, 5
Gain (coarse) 20 dB
Gain (fine) 4 dB
Reference Sensitivity 24 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .50"
Frequency 5.0 MHz
Mode long.
Nom. Angle 0 °
Measured Angle N/A °
Cable Type BNC to MDT
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" 1.3" Dia. 10.0"
Temperature 85 ° F
Thermometer S/N mR-82-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

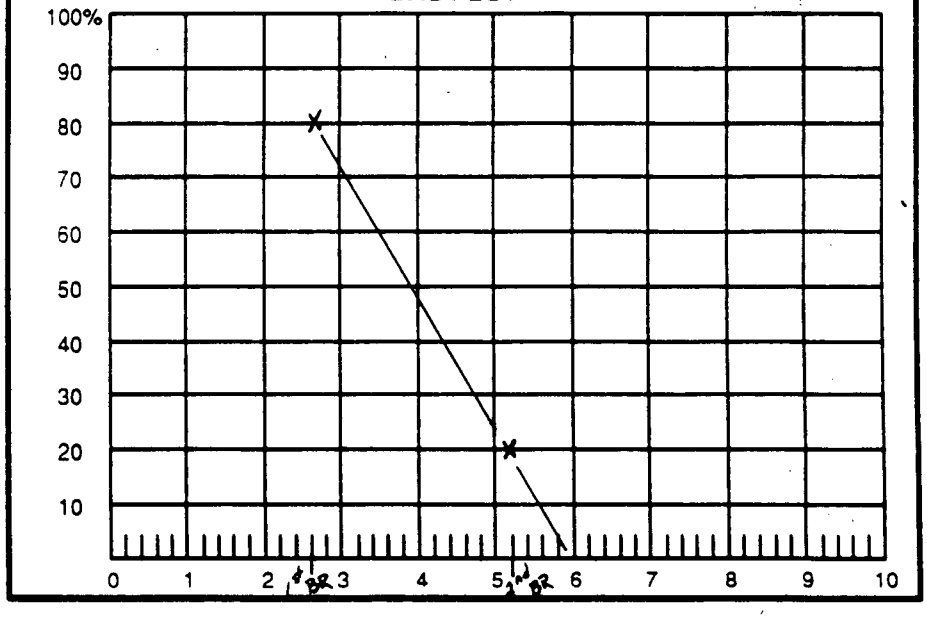
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	80
20	+12	79

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1328
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1340

REMARKS: N/A

EXAMINERS	1	Tim Adkins	LEVEL II	DATE	9-30-93
	2	Steve Wollum	LEVEL I	DATE	9-30-93
REVIEWERS	1	Scott Lowe	LEVEL III	DATE	10-1-93
	2	Richard B. Cutler	LEVEL N/A	DATE	10/2/93
	3	Al Valladares	LEVEL ANII	DATE	10/6/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-006
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

111-11

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 5.18 Delay 7.58
Range 2.5"
Gain (coarse) = 0 / 20 ± dB
Gain (fine) = 30 / 2 ± dB
Reference Sensitivity = 30 / 22 ± dB
Remarks:

SEARCH UNIT

Serial No. E20000
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-59
"T" 1.125" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

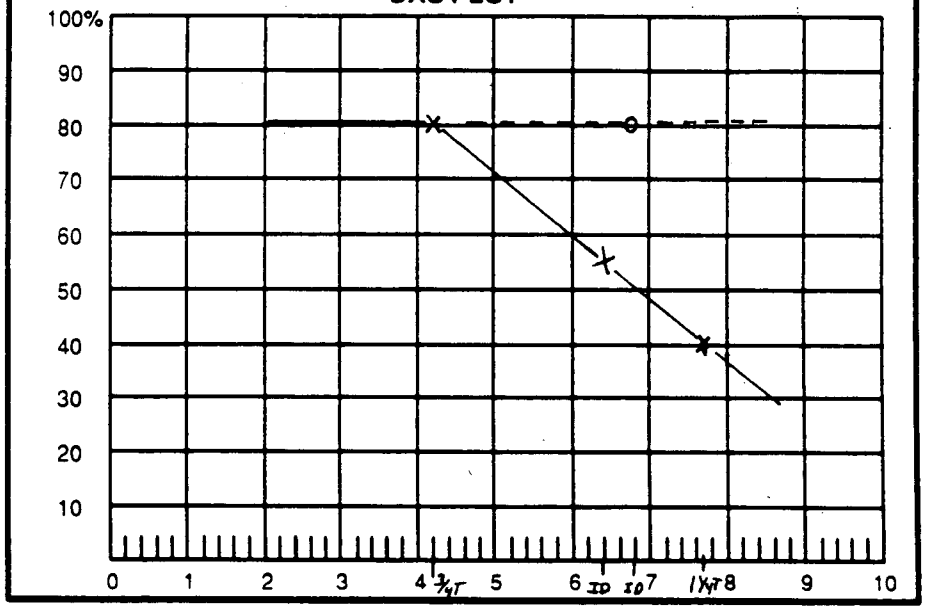
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1020
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1430

REMARKS: -12dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D NOTCH
X = AXIAL S.D.H

EXAMINERS	1	Tim Cobban	LEVEL	II	DATE 9-30-93
	2	Steve Wellington	LEVEL	I	DATE 9-30-93
REVIEWERS	1	Scott Lawson	LEVEL	III	DATE 10-1-93
	2	Richard A. Weber	LEVEL	N/A	DATE 10/2/93
	3	A Wallendorf	LEVEL	ANII	DATE 10/6/93

DATA SHEET NO. 1223-006
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

111-11

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 6.58 Delay 7.52
Range 2.5
Gain (coarse) = 20 / 0 ± dB
Gain (fine) = 22 / 30 ± dB
Reference Sensitivity = 42 / 30 ± dB
Remarks:

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 59 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-59
"T" 1.125" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .4"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

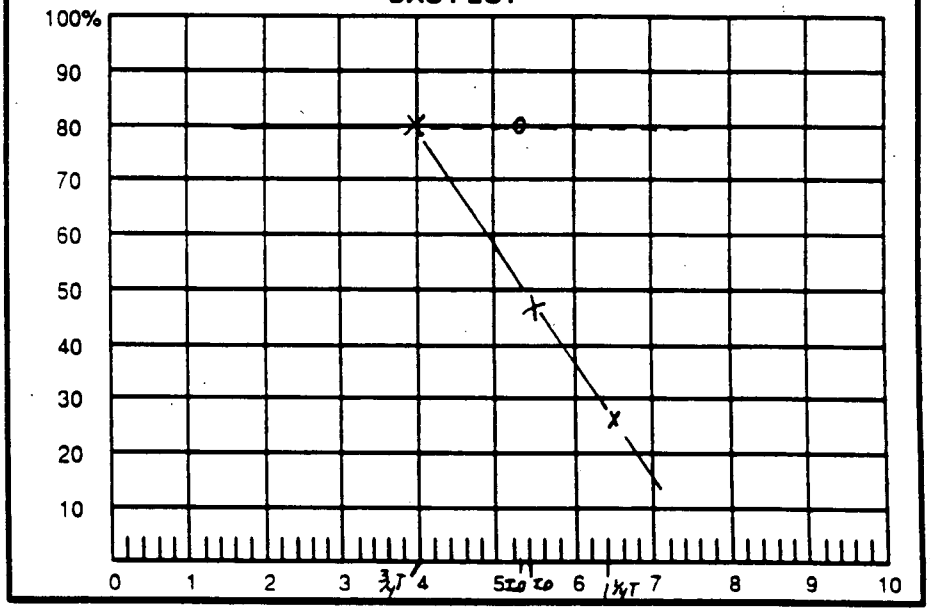
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1015
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1435

REMARKS: -6dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS 1 Tim Oldham LEVEL II DATE 9-30-93
2 Steve Wallbum LEVEL I DATE 9-30-93
REVIEWERS 1 Scott Lay LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 A Wallace LEVEL ANII DATE 10/6/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-006
PAGE 4 OF 5
EXAM ITEM

WELD 11

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP "B" 10" ACCUM. LIN.
ISO/DWG. NO. CPL-111 REV. 0
THERMOMETER S/N MR-92-03
COMPONENT TEMP. 85 ° F

SCAN 0 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A		X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

EXAMINERS:
1 Tim [illegible] LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93

REVIEWERS:
1 [illegible] LEVEL III DATE 10-1-93
2 Michael D. Weber LEVEL N/A DATE 10/2/93
3 A Valladares LEVEL ANII DATE 10/6/93

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-006
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Loop "B" to Accumulator
ISO/DWG. NO. CPL-111 REV. 0
THERMOMETER S/N MR-92-03
COMPONENT TEMP. 85 °F

EXAM ITEM: Weld 11

SCAN 45 ° / SCAN dB 32				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° / SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° / SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

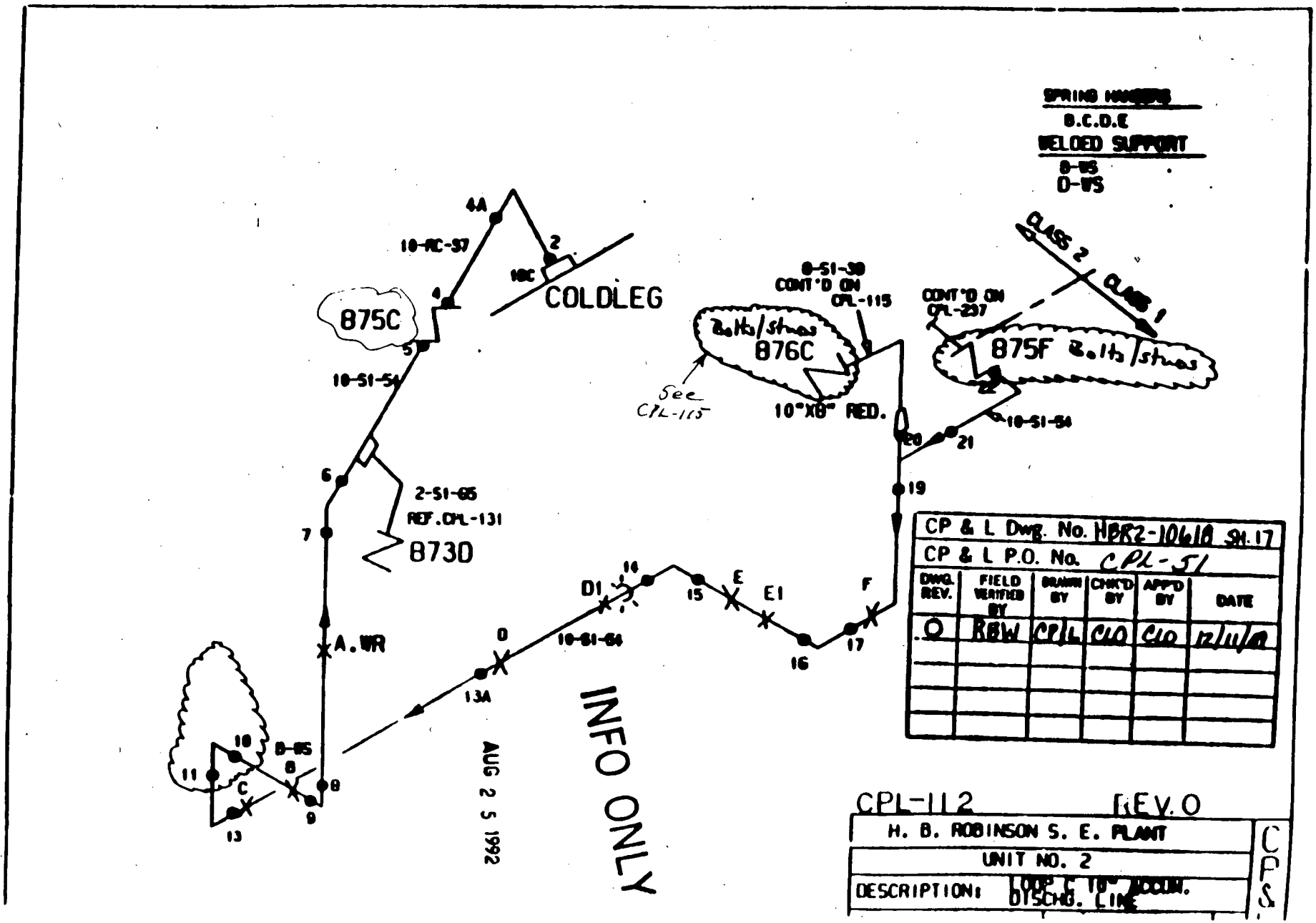
REMARKS: N/A

SCAN 60 ° / SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

EXAMINERS:
1 Tim Addison LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10-1-93
3 A Valladares LEVEL A/N II DATE 10/6/93



I certify that the image contained on this film was made to the best of my ability.

1237-017

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. ~~1230-032~~
Page 1 of 1

Project Job No. Unit 1☐ 2☒

System: SI	Component Name: VALVE BOLTING	Component ID No.: 112-SI-V875C
Class: ONE	Location/Isometric: S/G B - Rx. Bldg. / CPL-112 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% GRAY NEUTRAL CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 NUTS/STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

Examiner: Eugene Sanz Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed Scott Lam III 10-4-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 10/7/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Palladares 10/7/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-009
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: SEAL INJECTION	Component Name: VALVE BOLTING	Component ID No.: VSI-875F
Class: ONE	Location/Isometric: CPL-112 R/O	
Procedure: SP.1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 NUTS		✓		✓		✓		✓		✓		✓	✓	
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes:

NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-20-93

Examiner: [signature] N/A Level: N/A Date: 9-20-93 N/A

Comments/Notes:

Reviewed: [signature] LTII 9-24-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93

ANII KAValladare 9-23-93

DATA SHEET NO. 1217-022
THERMOMETER S/N MR92-03
TEMPERATURE 87 ° F
NOMINAL THICKNESS .125" INCHES
MATERIAL S/S
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Loop C 10" ACCUM. DISCHG LINE ISO/DWG/SK. # CPL-112 REVISION 0

DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #10	NO RECORDABLE INDICATIONS	X	N/A
WELD #11	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Chris D. Judd LEVEL II DATE 9-27-93
EXAMINER Benjamin J. Sanders LEVEL I DATE 9-27-93
REVIEWER Scott Lamb LEVEL III DATE 9-27-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANIL A. Palladares DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-005
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

112-10

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 5.50 Delay 8.44
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 4 dB
Reference Sensitivity 24 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .50"
Frequency 5.0 MHz
Mode Long.
Nom. Angle 0 °
Measured Angle N/A °
Cable Type BNC to MDT
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" 1.3" Dia. 10.0"
Temperature 83 ° F
Thermometer S/N MR-92-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

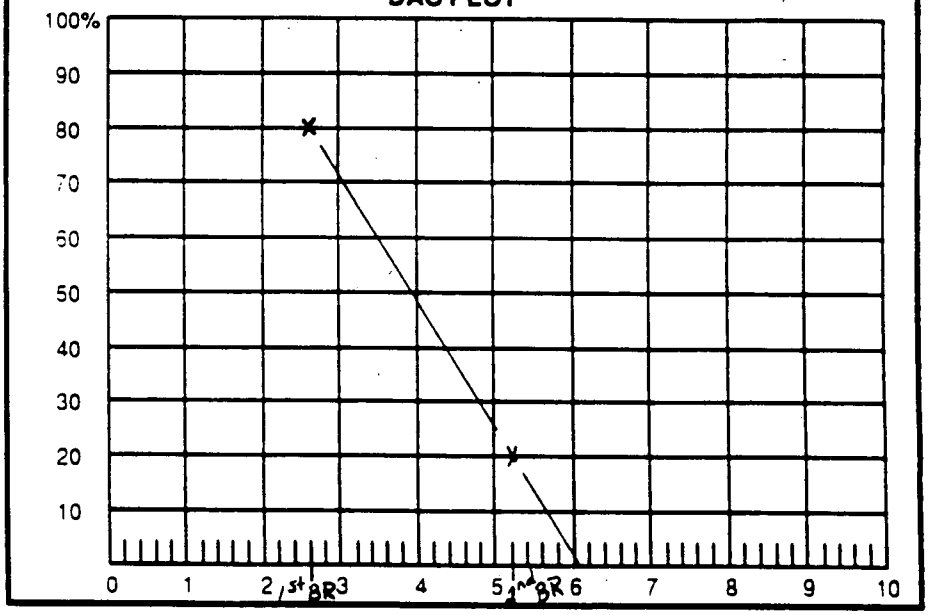
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	80
20	+12	79

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1145
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1205

REMARKS: N/A

EXAMINERS 1 Tim Ashton LEVEL II DATE 9-30-93
2 Steve Wolbert LEVEL I DATE 9-30-93
REVIEWERS 1 Scott Lam LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 R Wallace LEVEL ANII DATE 10-5-93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-005
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

112-10

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 5.18 Delay 7.58
Range 25"
Gain (coarse) = 0 / 20 ± dB
Gain (fine) = 30 / 2 ± dB
Reference Sensitivity = 30 / 22 ± dB
Remarks:

SEARCH UNIT

Serial No. E20000
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-59
"T" 1.125" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .25"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

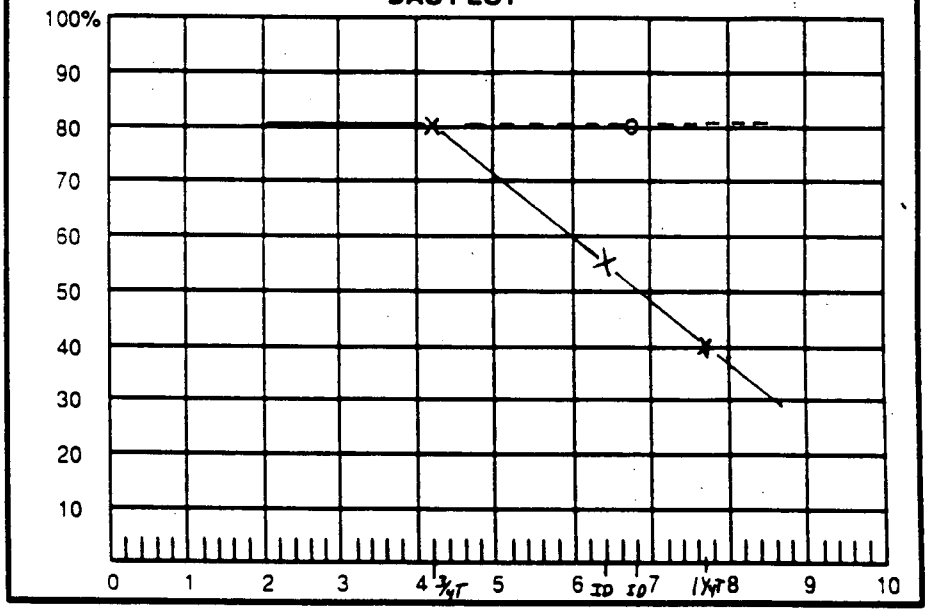
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1020
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1430

REMARKS: -12dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS	1	Tim Addison	LEVEL	II	DATE 9-30-93
	2	Steve Wollwage	LEVEL	I	DATE 9-30-93
REVIEWERS	1	Scott Lam	LEVEL	III	DATE 10-1-93
	2	Linda B. Weber	LEVEL	N/A	DATE 10/2/93
	3	A Valladares	LEVEL	ANII	DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-005
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

112-10

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 6.58 Delay 7.52
Range 2.5
Gain (coarse) = 20 / 0 ± dB
Gain (fine) = 22 / 30 ± dB
Reference Sensitivity = 42 / 30 ± dB
Remarks:

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 59 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-59
"T" 1.125" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .4"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

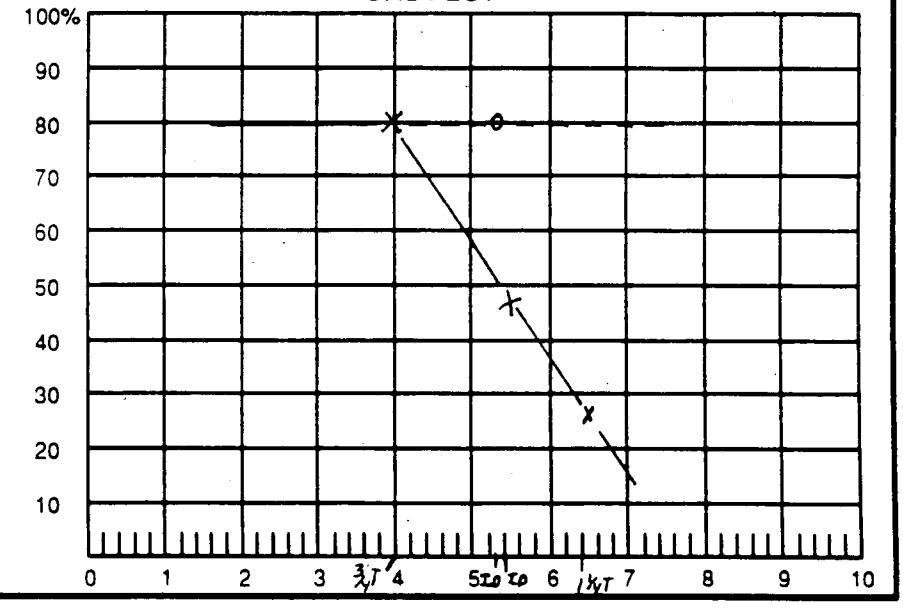
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1015
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1435

REMARKS: -6dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS 1 Tim Oddam LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93
REVIEWERS 1 Scott Lamm LEVEL III DATE 10-1-93
2 Richard B Webber LEVEL N/A DATE 10/5/93
3 RP Wallace LEVEL ANII DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-005
PAGE 4 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP "C" 10" ACCUM LINE
ISO/DWG. NO. CPL-112 REV. 0
THERMOMETER S/N MR-92-03
COMPONENT TEMP. 83 °F

EXAM ITEM
WELD 10

SCAN 0 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
☒	N/A	N/A		☒	N/A	N/A	☒	N/A	☒	☒	N/A

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:
N
A

EXAMINERS:
1 Tim Oddsen LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93

REVIEWERS:
1 LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/7/93
3 LEVEL ANII DATE 10/5/93

DATA SHEET NO. 1223-005
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Loop "C" to Accum. Line
ISO/DWG. NO. CPL-112 REV. 0
THERMOMETER S/N MR-92-03
COMPONENT TEMP. 83 ° F

EXAM ITEM: Weld 10

SCAN 45 ° SCAN dB 32				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

EXAMINERS:
1 Tim Addison LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 Richard B Weber LEVEL N/A DATE 10/2/93
3 [signature] LEVEL ANII DATE 10/5/93

DATA SHEET NO. 1223-004
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

112-11

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 5.50 Delay 8.44
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 4 dB
Reference Sensitivity 24 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .50"
Frequency 5.0 MHz
Mode Long.
Nom. Angle 0 °
Measured Angle N/A °
Cable Type BNC to MDT
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" 1.3" Dia. 10.0"
Temperature 83 ° F
Thermometer S/N MR-92-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

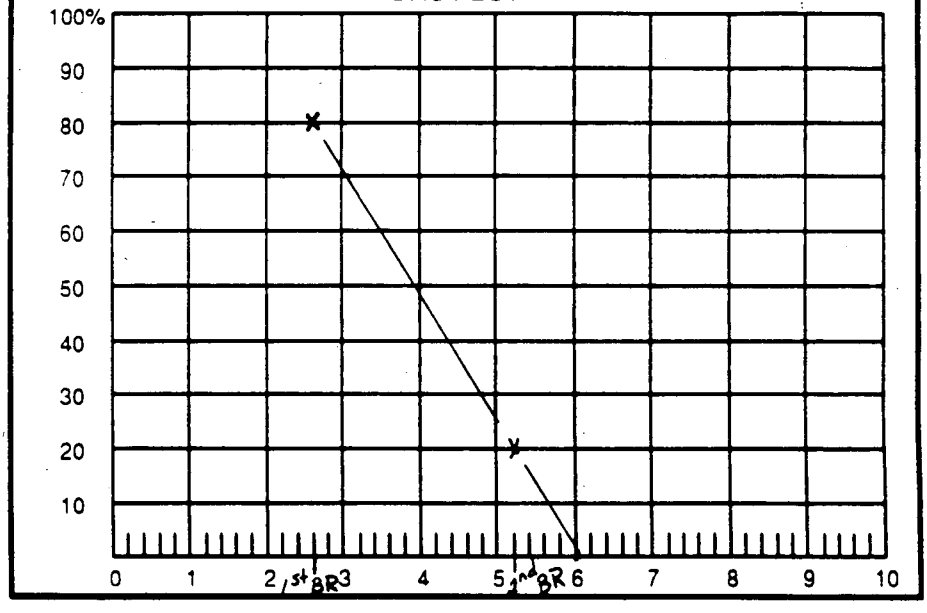
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	41
80	−12	21
40	+6	80
20	+12	79

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1208
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1230

REMARKS: N/A

EXAMINERS 1 Tim Addison LEVEL II DATE 9-30-93
2 Steve Wollam LEVEL I DATE 9-30-93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 R Belladonna LEVEL ANII DATE 10/6/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-004
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

112-11

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 5.18 Delay 7.58
Range 25"
Gain (coarse) = 0 / 20 ± dB
Gain (fine) = 30 / 2 ± dB
Reference Sensitivity = 30 / 22 ± dB
Remarks:

SEARCH UNIT

Serial No. E20000
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-59
"T" 1.125" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

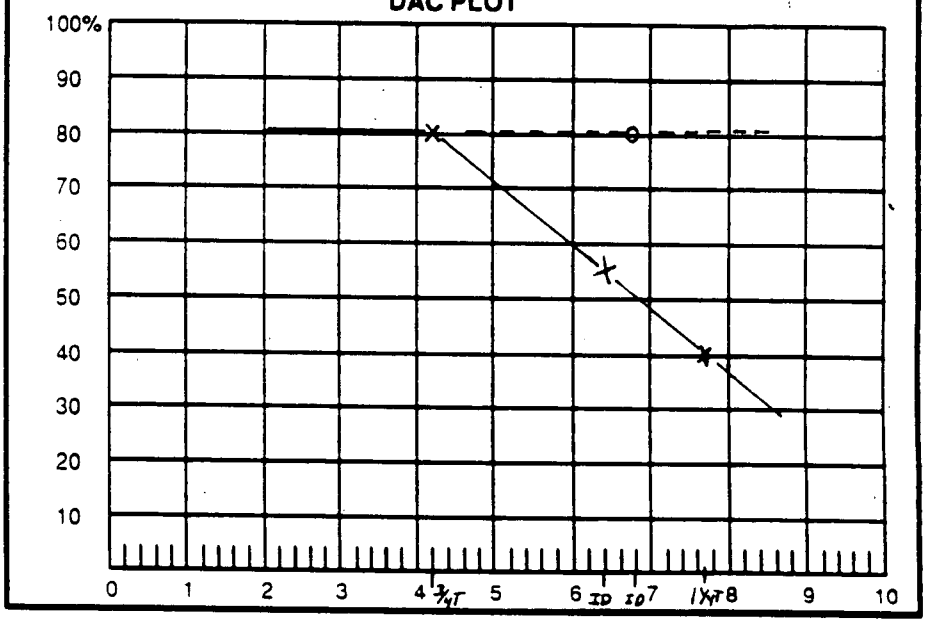
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1020
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1430

DAC PLOT



REMARKS: -12dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.O.H

EXAMINERS	1	Tim Addam	LEVEL	II	DATE 9-30-93
	2	Steve Wollum	LEVEL	I	DATE 9-30-93
REVIEWERS	1	Scott Lamm	LEVEL	III	DATE 10-1-93
	2	Richard B. Weber	LEVEL	N/A	DATE 10/2/93
	3	R P Wallace	LEVEL	ANII	DATE 10/6/93

DATA SHEET NO. 1223-004
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

112-11

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 6.58 Delay 2.52
Range 2.5"
Gain (coarse) = 20 / 0 ± dB
Gain (fine) = 22 / 30 ± dB
Reference Sensitivity = 42 / 30 ± dB
Remarks:

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 59 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-59
"T" 1.125" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .4"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

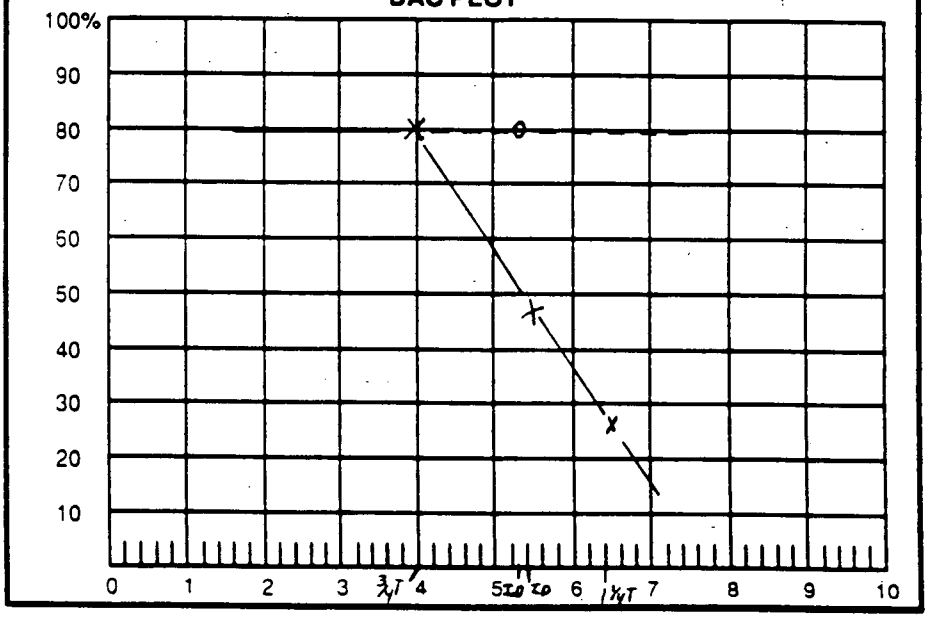
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1015
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1435

DAC PLOT



REMARKS: -6dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS 1 Tim Adkins LEVEL II DATE 9-30-93
2 Steve Wollums LEVEL I DATE 9-30-93
REVIEWERS 1 Scott Lam LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 R Wallendorf LEVEL ANII DATE 10/6/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-004
PAGE 4 OF 5
EXAM ITEM

WELD 11

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP "C" 10" ACCUM. LINE
ISO/DWG. NO. CPL-112 REV. 0
THERMOMETER S/N MR-92-03
COMPONENT TEMP. 83 ° F

SCAN 0 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A		X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

EXAMINERS:
1 Tim Oddam LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93

REVIEWERS:
1 LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 RPValladares LEVEL ANII DATE 10/6/9

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-004
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Loop "C" w" ACCUM. LINE
ISO/DWG. NO. CPL-112 REV. 0
THERMOMETER S/N MR-92-03
COMPONENT TEMP. 83 ° F

EXAM ITEM: weld 11

SCAN 45 ° / SCAN dB 32				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° / SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° / SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

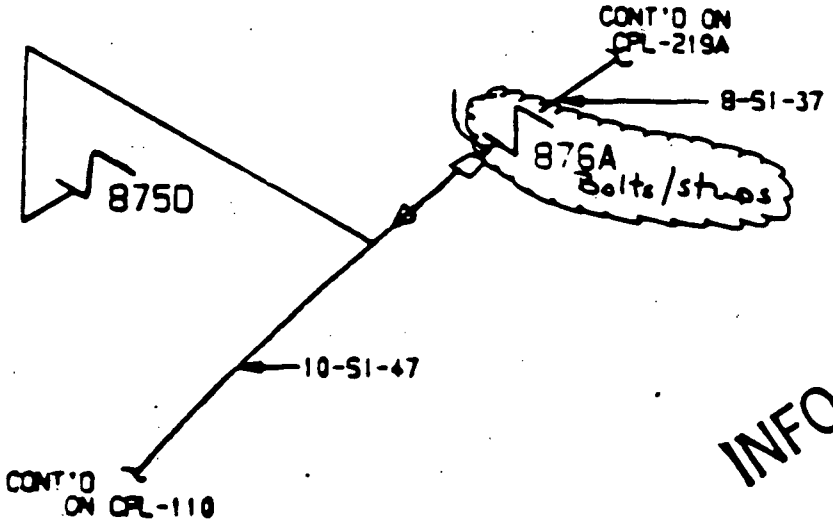
REMARKS: N/A

SCAN 60 ° / SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

EXAMINERS:
1 Tim Addison LEVEL II DATE 9-30-93
2 Steve Wollum LEVEL I DATE 9-30-93

REVIEWERS:
1 Scott Lamm LEVEL III DATE 10-1-93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 A Valladares LEVEL AN II DATE 10/6/93



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH 18					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/11/89

CPL-113 REV. 0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION - LOOP A-8" RHR RETURN	
LINE NO. 8-SI-37	CPL- 113 REV.

CF&L

I certify that the image contained on this frame was made in the normal and regular course of business on the date stated below and that it is an accurate reproduction...

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. _____
Page ____ of ____

Project HBR Job No. Unit 1 ☐ 2 ☒

System: Safety Injection	Component Name: Check Valve	Component ID No.: 876A
Class: 1	Location/Isometric: CPL-113 Rev 0	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: Flashlight, Mirror, Neutral Gray Card		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 Studs	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 Nuts	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 Washers	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A

Comments/Notes: Studs, Nuts, Washers were Inspected in-place.

Examiner: _____ Level: II Date: 9/21/93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: _____ LIII 9-24-93

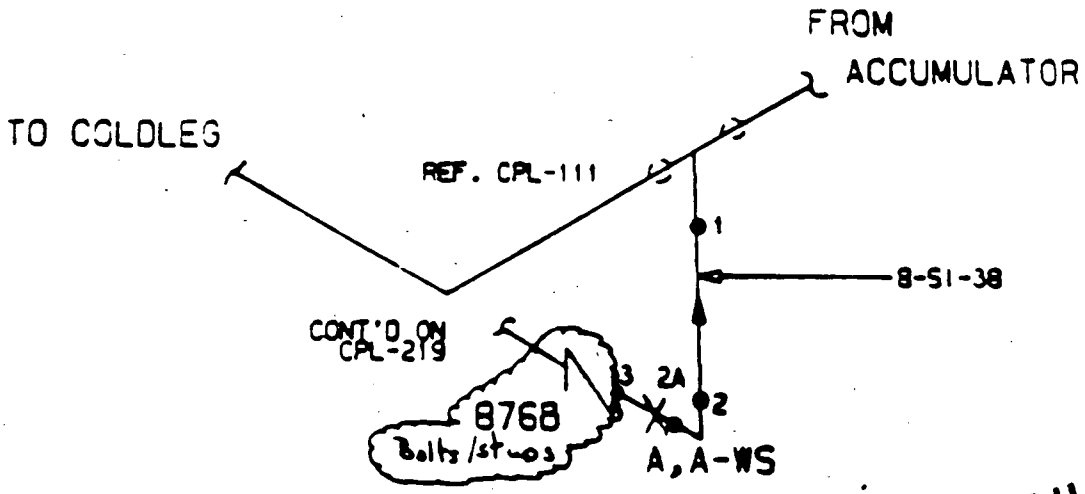
(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 9/27/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Palladares 9/28/93

WELDED SUPPORT
A-83



INFO ONLY

AUG 2 5 1988

CP & L Dwg. No. HBR-10618 SH 19					
CP & L P.O. No. CPL-51					
CWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLD	CLD	12/11/69

CPL-114 REV. 0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION -LOOP 8-8"RHR RETURN	
LINE NO. 8-SI-38	CPL-114 REV.

CP&L

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-010
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: SEAL INJECTION	Component Name: VALVE BOLTING	Component ID No.: VSI-876B
Class: ONE	Location/Isometric: CPL-114 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 NUTS		✓		✓		✓		✓		✓		✓	✓	
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-20-93

Examiner: [signature] Level: III Date: 9-21-93

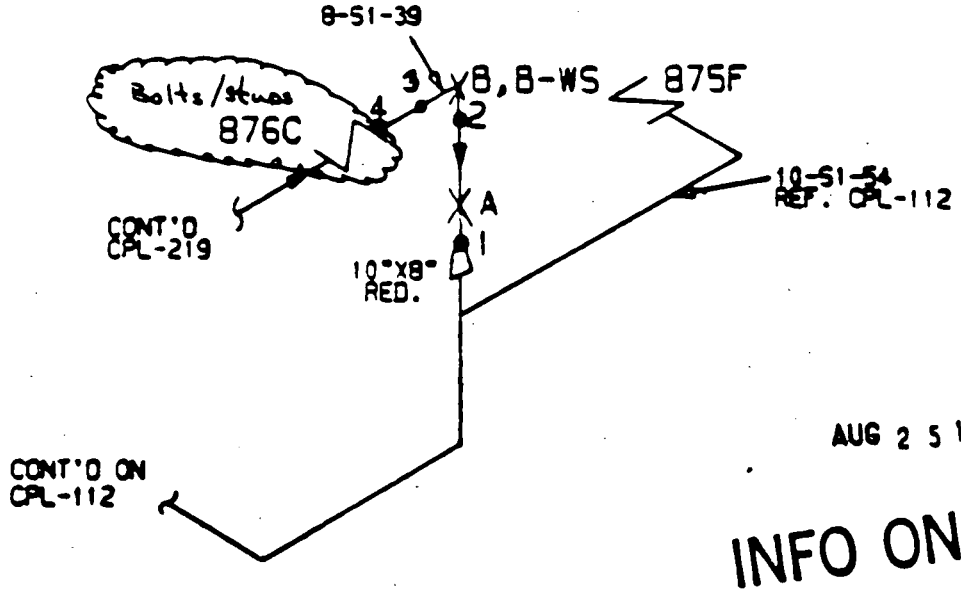
Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93
ANII [signature] 9-23-93

SPRING HANGERS
8
WELDED SUPPORT
8-85



AUG 2 5 1992.

INFO ONLY

CP & L Dwg No. HBR2-10613 SH 20					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CP&L	CLO	CLO	12/11/89

CPL-115 REV. 0

H.B. ROBINSON S.E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION -LOOP C-8"RHR RETURN	
LINE NO. 8-S1-39	CPL-115 REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-011
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: SAFETY ~~SEAL~~ INJECTION (9-20-93)	Component Name: VALVE BOLTING	Component ID No.: VSI-876C
Class: ONE	Location/Isometric: CPL-115 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
16 NUTS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
16 STUDS		✓		✓		✓		✓		✓		✓	✓	
16 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

Examiner: Edward Scott Lawson Level: III Date: 9-20-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

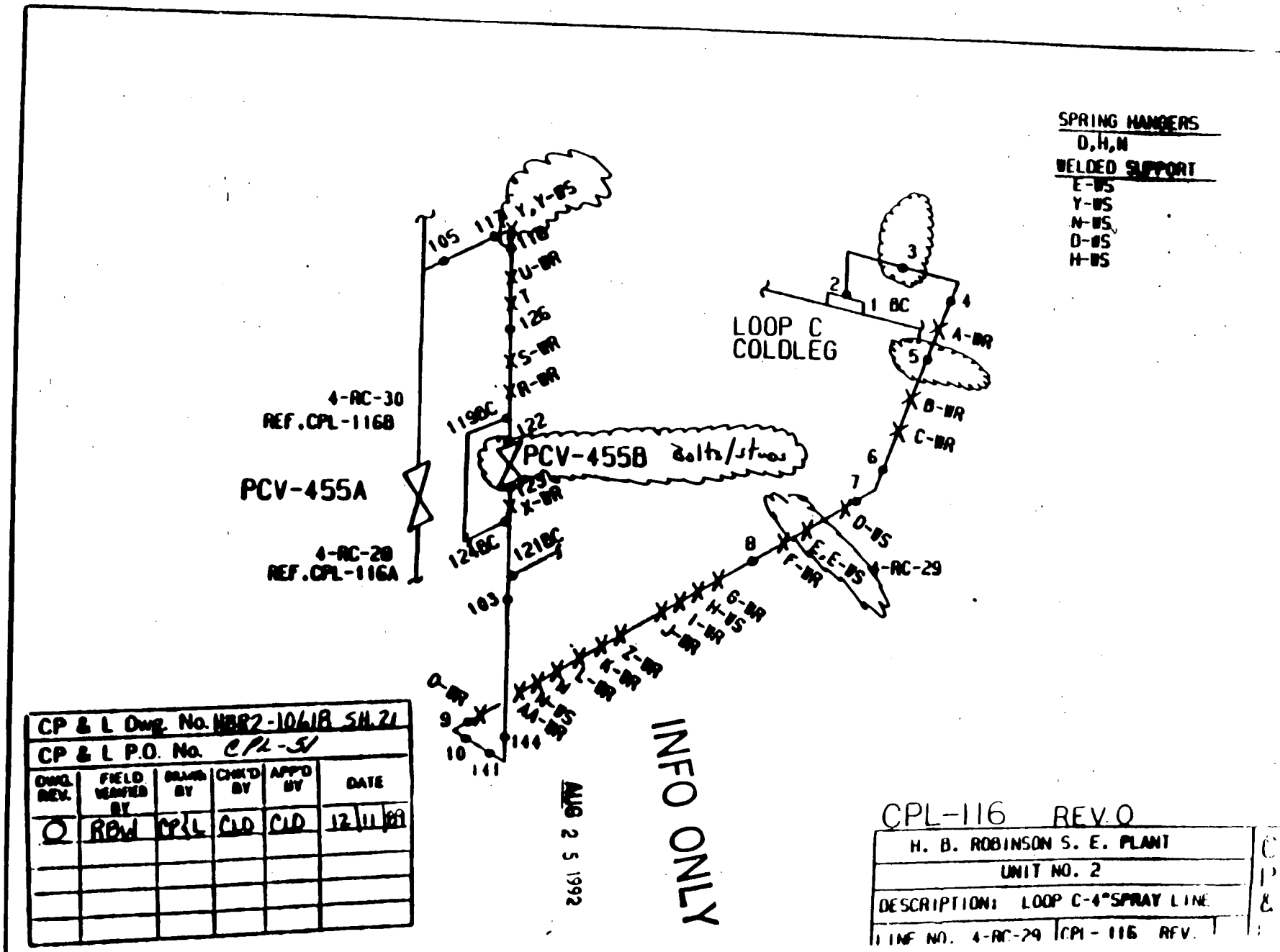
Edward Scott Lawson LTII 9-24-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 9/23/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R. Valladares 9/23/93



CP & L Dwg. No. MBR2-10618 SH.21					
CP & L P.O. No. CPL-SI					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
Q	RBW	CPL	CLD	CLD	12 11 89

CPL-116 REV.Q

H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: LOOP C-4"SPRAY LINE
LINE NO. 4-RC-29 CPL-116 REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date stated below and that it is...

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-084
Page 1 of 1

Project HBR2 Job No. PSI ☐ ISI ☒

System: RC	Component Name: SUPPORT	Component ID: E
Drawing/Location: CPL-116		
☒ VT-3 Procedure: SP-1230 Rev. 0	☒ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☒	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: ☒ Hydraulic Snubber ☒ Mechanical Snubber ☒ Support/Hanger ☒ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference	N/A	X	" " "
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	SHIM MISSING
Loose/missing parts	X	N/A	" "
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion	N/A	X	" " "
Abnormal gouges	N/A	X	" " "
Arc Strikes on sliding support	N/A	X	" " "
Misalignment of the support	X	N/A	CLEARANCE GAP 3/16"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: [signature] Date: 10/28/93

S2 10-21-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-~~018~~ 118
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: RC	Component Name: Variable Support	Component ID: 116 Y
Drawing/Location: CPL-116		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2775		
Snubber N A	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Scott Olson Level: III Date: 10-21-93

Examiner: Level: Date:

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93
ANII A. Palladares

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-019
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: REACTOR COOLANT	Component Name: VALVE BOLTING	Component ID No.: PCV-455B
Class: ONE	Location/Isometric: CAL-116 R/O / 228' Hoop - Pressurizer - Bottom	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
8 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
8 NUTS		✓		✓		✓		✓		✓		✓	✓	
8 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED (EXCEPT SLIGHT TRACES OF BORON)

Examiner: [signature] Level: III Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Wade Date: 10/14/93

QA NDE ISI 6, Rev. 1, 07/93

ANII A. Palladares 10/14/93

DATA SHEET NO. 1217-051
THERMOMETER S/N JL-91-03
TEMPERATURE 85 ° F
NOMINAL THICKNESS .526 INCHES
MATERIAL 3/5
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED Spray Line ISO/DWG/SK. # CPL-116 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 3	NRI	X	N/A
Weld No. 5	NRI	X	

EXAMINER Tim Addison LEVEL II DATE 10-6-93
EXAMINER David G Mantz LEVEL II DATE 10/6/93
REVIEWER Scott Lowe LEVEL III DATE 10-6-93
REVIEWER Richard B. Weber DATE 10/7/93
REVIEWER R Valladares ANII DATE 10/7/93

DATA SHEET NO. 1223-025
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-116 - WELD #3

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 2.10 Delay 6.90
Range .5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. H26323
Size .5"
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0° °
Measured Angle N/A °
Cable Type RG-174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-116 - 3
"T" .526" Dia. 4"
Temperature 85 °F
Thermometer S/N JL-91-03

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .2"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

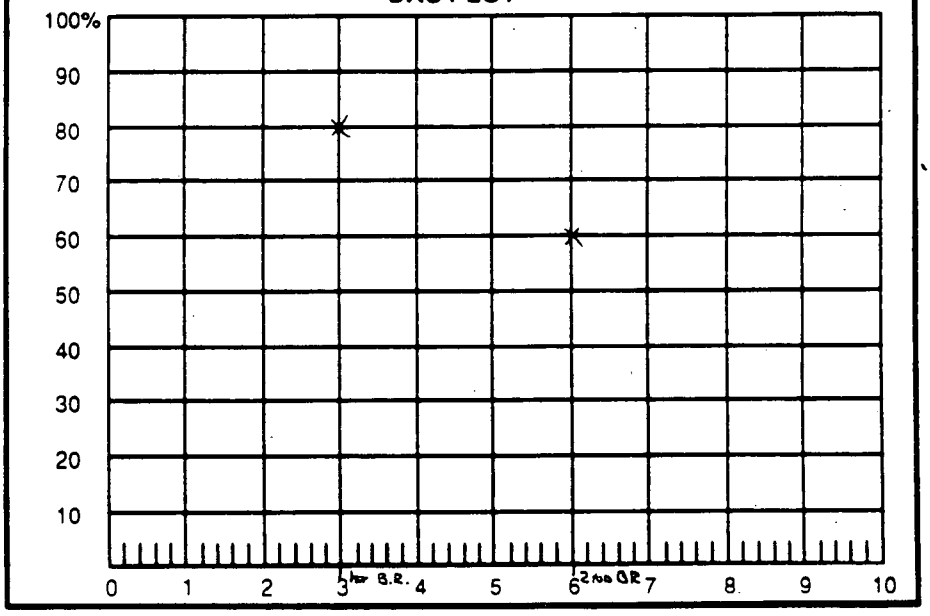
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	19
40	+6	78
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1315
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1600

REMARKS: N/A

EXAMINERS	1 David M Manto	LEVEL II	DATE 10/6/93
	2 Tim Ogden	LEVEL II	DATE 10/6/93
REVIEWERS	1 Scott Lamm	LEVEL III	DATE 10-11-93
	2 Richard B. Weber	LEVEL N/A	DATE 10/11/93
	3 R Wallace	LEVEL AN II	DATE 10/11/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-025
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116 - Weld #3

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 4.70 Delay 7.94
Range 2.5
Gain (coarse) = 40 / ± 20 dB
Gain (fine) = 16 / ± 18 dB
Reference Sensitivity = 56 / 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 43 °
Cable Type BNC to MDT
Cable Length 6'
Remarks: .35" From Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-24
"T" .526" Dia. 4.0"
Temperature 76 ° F
Thermometer S/N JL-91-03

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks: N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	11
5	60	30	10	10	6

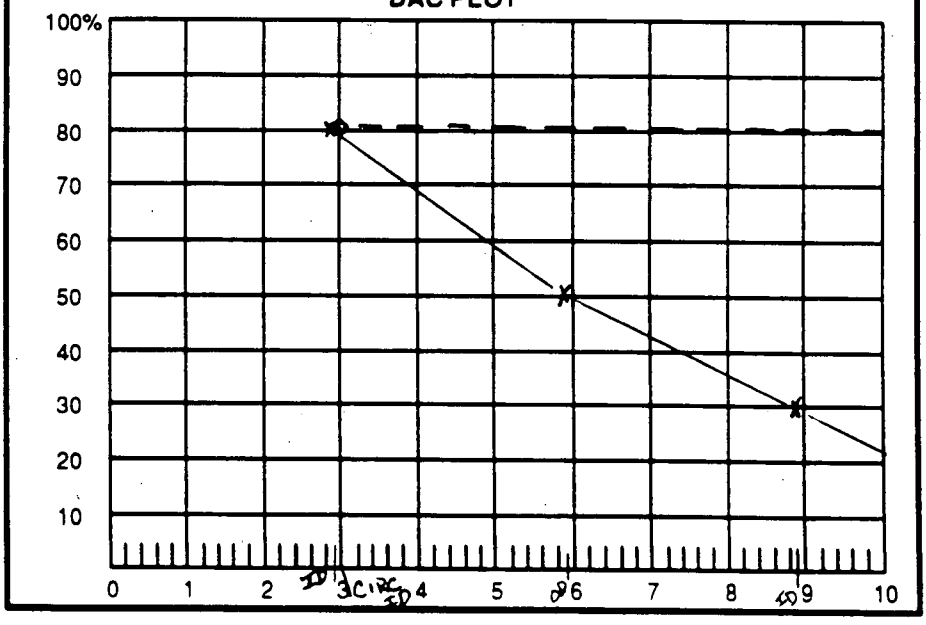
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	1328
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1606

DAC PLOT



REMARKS:

EXAMINERS 1 [signature] LEVEL II DATE 10-6-93
2 [signature] LEVEL II DATE 10-6-93
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL AN II DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-025
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116 WGCD # 3

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 8.11 Delay 7.85
Range 2.5"
Gain (coarse) +40 / = 40 dB
Gain (fine) + 10 / = 18 dB
Reference Sensitivity +50 / = 58 dB
Remarks: N/A

SEARCH UNIT

Serial No. J09185
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60
Measured Angle 58
Cable Type RG-174/U
Cable Length 6'
Remarks: .3" EXIT POINT TO FRONT OF WEDGE
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4"
Temperature 76 °F.
Thermometer S/N JL-91-C3

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

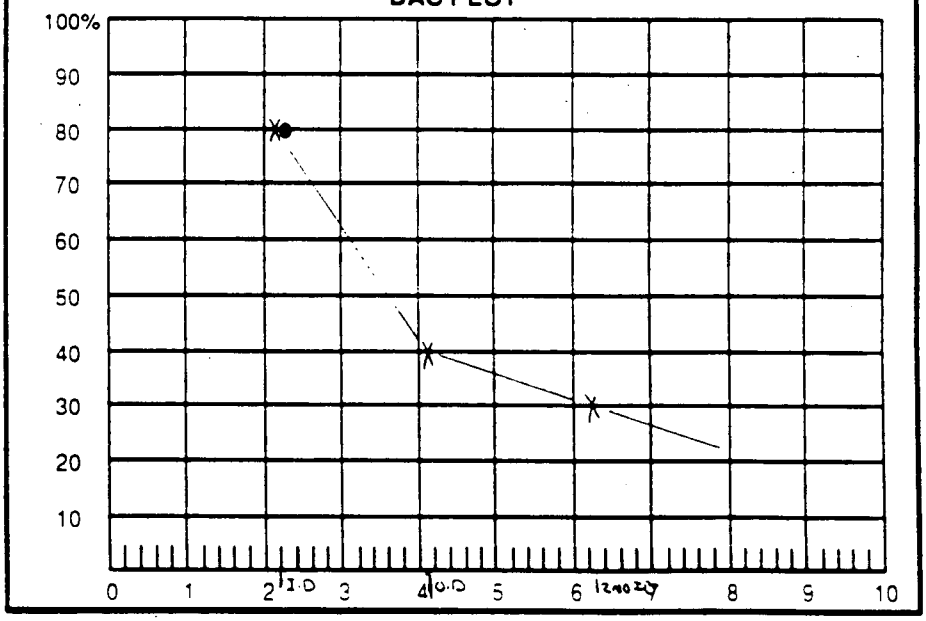
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1345
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1610

DAC PLOT



REMARKS: X = AXIAL SCAN I.D. O.D. NOTCHES
• = CIRC. SCAN I.D. NOTCH
N/A

EXAMINERS	1	David Y Manta	LEVEL II	DATE 10/6/93
	2	Tim Oldham	LEVEL II	DATE 10/6/93
REVIEWERS	1	Matt Lam	LEVEL III	DATE 10-11-93
	2	Richard B. Weber	LEVEL N/A	DATE 10/11/93
	3	R Wallace	LEVEL N II	DATE 10/11/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-025
PAGE 4 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Spray Line
ISO/DWG. NO. CPL-116 REV. 0
THERMOMETER S/N JL-91-03
COMPONENT TEMP. 85 ° F

EXAM ITEM

CPL-116 Weld #3

SCAN 45 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Elbow Complete Both Sides

SCAN 45 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Elbow Complete Both Sides

SCAN 60 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Elbow Complete Both Sides

SCAN 60 ° SCAN dB 68				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Elbow Complete Both Sides

EXAMINERS:
1 David M Martin LEVEL II DATE 10/6/93
2 Tim Addam LEVEL II DATE 10-6-93

REVIEWERS:
1 Scott Lowe LEVEL III DATE 10-11-93
2 Linda B. Weber LEVEL N/A DATE 10/11/93
3 R Wallace LEVEL ANII DATE 10/11 93

DATA SHEET NO. 1223-025
PAGE 5 OF 5
EXAM ITEM
CPL-116 WELD # 3

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM #3/SPRAYLINE
ISO/DWG. NO. CPL-116 REV. 0
THERMOMETER S/N JL-91-03
COMPONENT TEMP. 85 ° F

SCAN 0 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: ELBOW TO ELBOW. COMPLETE BOTH SIDES.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 LEVEL II DATE 10-6-93
2 LEVEL II DATE 10-6-93

REVIEWERS:
1 LEVEL III DATE 10-11-93
2 LEVEL N/A DATE 10/11/93
3 R Valladares LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1223-026
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116 WELD #5

INSTRUMENT

Model USN-7
Serial No. 27276-807
Sweep Length 2.10 Delay 6.90
Range .5"
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. H26323
Size .5"
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0° °
Measured Angle N/A °
Cable Type RG-174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-116 - 5
"T" .526" Dia. 4"
Temperature 85 °F
Thermometer S/N JL-91-03

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .2"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

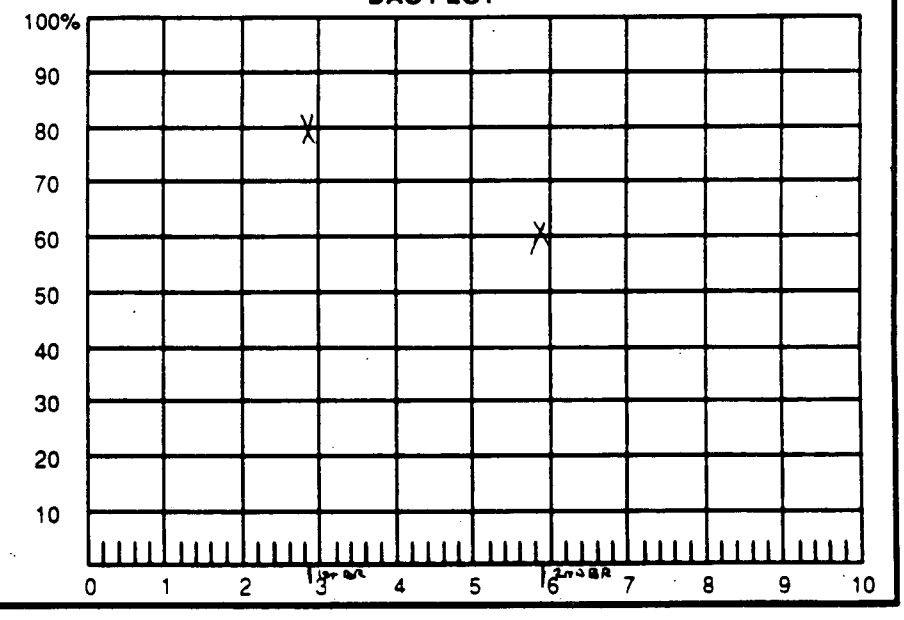
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	19
40	+6	78
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1315
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1600

REMARKS: N/A

EXAMINERS 1 David M Mentus LEVEL II DATE 10/6/93
2 Tim Oldham LEVEL II DATE 10/6/93

REVIEWERS 1 Scott Kam LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 A Palladino LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-026
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116 - Weld #5

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 4.70 Delay 7.94
Range 2,5
Gain (coarse) = 40 / ± 20 dB
Gain (fine) = 16 / ± 18 dB
Reference Sensitivity = 56 / 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 43 °
Cable Type BNC to NDT
Cable Length 6'
Remarks: .35" From Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-24
"T" .526" Dia. 4.0"
Temperature 76 ° F
Thermometer S/N JL-91-03

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks: N/A

VERTICAL LINEARITY

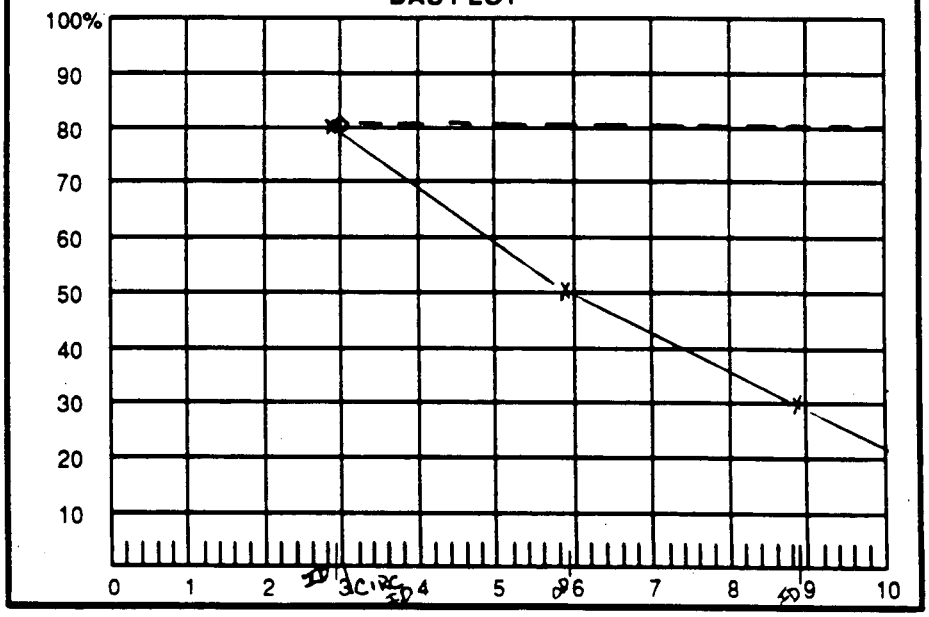
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	11
5	60	30	10	10	6

COUPLANT

Brand Ultragel II
Batch No. 093051

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1328
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1606

REMARKS: N/A

EXAMINERS 1 Tim Olson LEVEL II DATE 10-6-93
2 David M Martin LEVEL II DATE 10/6/93

REVIEWERS 1 Scott Lam LEVEL III DATE 10-11-93
2 Richard B Weber LEVEL N/A DATE 10/11/93
3 A Balladares LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. ~~1223-026~~ 1223-026 SL 10-11-93

PAGE 3 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223

REV. 0

CHANGE NO. N/A

CPL-116 WELD #5

INSTRUMENT

Model USK-7

Serial No. 27276-784

Sweep Length 8.11 Delay 7.85

Range 2.5"

Gain (coarse) +40 / = 40 dB

Gain (fine) + 10 / = 18 dB

Reference Sensitivity +50 / = 58 dB

Remarks: N/A

SEARCH UNIT

Serial No. J09185

Size .25"

Frequency 2.25 MHz

Mode SHEAR

Nom. Angle 60

Measured Angle 58

Cable Type RG-174/U

Cable Length 6'

Remarks: .3" EXIT POINT TO FRONT OF WEDGE N/A

CALIBRATION BLOCK

No. CPL-24

"T" .526 Dia. 4"

Temperature 76 °F

Thermometer S/N JL-91-03

CALIBRATION

0° N/A Axial ✓ Circ. ✓

Metal Path ✓ Depth N/A

Each Major Screen Div. = .5"

Remarks N/A

COUPLANT

Brand ULTRAGEL II

Batch No. 093051

VERTICAL LINEARITY

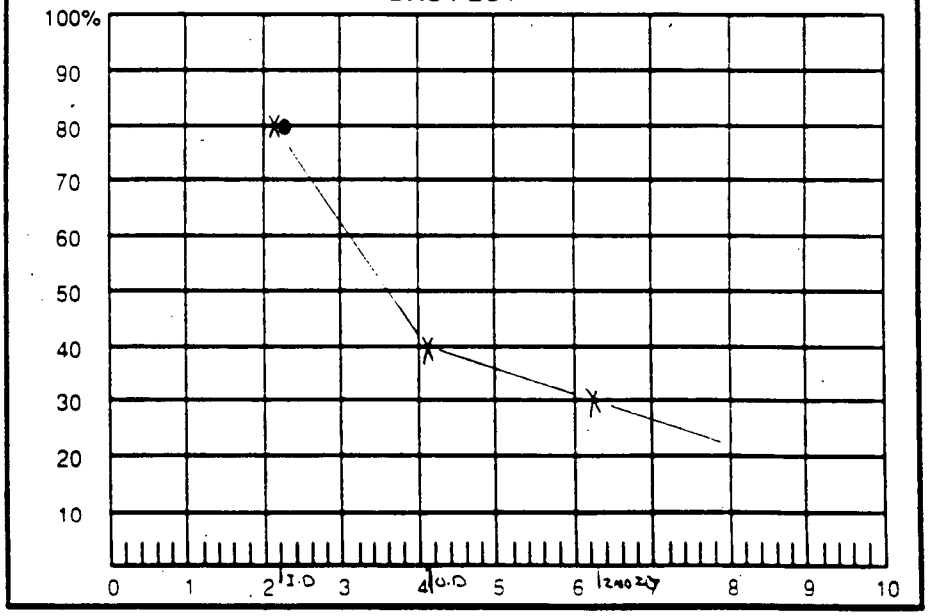
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1345
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1610

REMARKS: X = AXIAL SCAN I.D. O.D. NOTCHES

• = CIRC. SCAN I.D. NOTCH

N/A

EXAMINERS	1	David Montes	LEVEL	II	DATE 10/6/93
	2	Tim Aldaz	LEVEL	II	DATE 10/6/93
REVIEWERS	1	Scott Jones	LEVEL	III	DATE 10-11-93
	2	Richard B Weber	LEVEL	N/A	DATE 10/11/93
	3	J Valladares	LEVEL	ANII	DATE 10/12/93

DATA SHEET NO. 1223-026
PAGE 4 OF 5
EXAM ITEM
CPL-116 WELD #5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM #5/SPRAY LINE
ISO/DWG. NO. CPL-116 REV. 0
THERMOMETER S/N JL-91-03
COMPONENT TEMP. 85 ° F

SCAN 0 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO PIPE. COMPLETE BOTH SIDES

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 ______ LEVEL II DATE 10/6/93
2 ______ LEVEL II DATE 10/6/93

REVIEWERS:
1 ______ LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 G.P. Valladares LEVEL ANII DATE 10/13/93

NES 9/90 – REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-026
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Spray Line
ISO/DWG. NO. CPL-116 REV. 0
THERMOMETER S/N JL-91-03
COMPONENT TEMP. 85 ° F

EXAM ITEM: CPL-116 Weld #5

SCAN 45 ° SCAN dB 48	EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0° ⊥ =	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A N/A N/A N/A		N/A	N/A		N/A			N/A

REMARKS: Pipe to Pipe Complete Both Sides

SCAN 45 ° SCAN dB 66	EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0° ⊥ =	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A N/A N/A N/A		N/A	N/A		N/A			N/A

REMARKS: Pipe to Pipe Complete Both Sides

SCAN 60 ° SCAN dB 60	EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0° ⊥ =	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A N/A N/A N/A		N/A	N/A		N/A			N/A

REMARKS: Pipe to Pipe Complete Both Sides

SCAN 60 ° SCAN dB 68	EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0° ⊥ =	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A N/A N/A N/A		N/A	N/A		N/A			N/A

REMARKS: Pipe to Pipe Complete Both Sides

EXAMINERS:
1 Tim Oddom LEVEL II DATE 10-6-93
2 David H Martin LEVEL II DATE 10/6/93

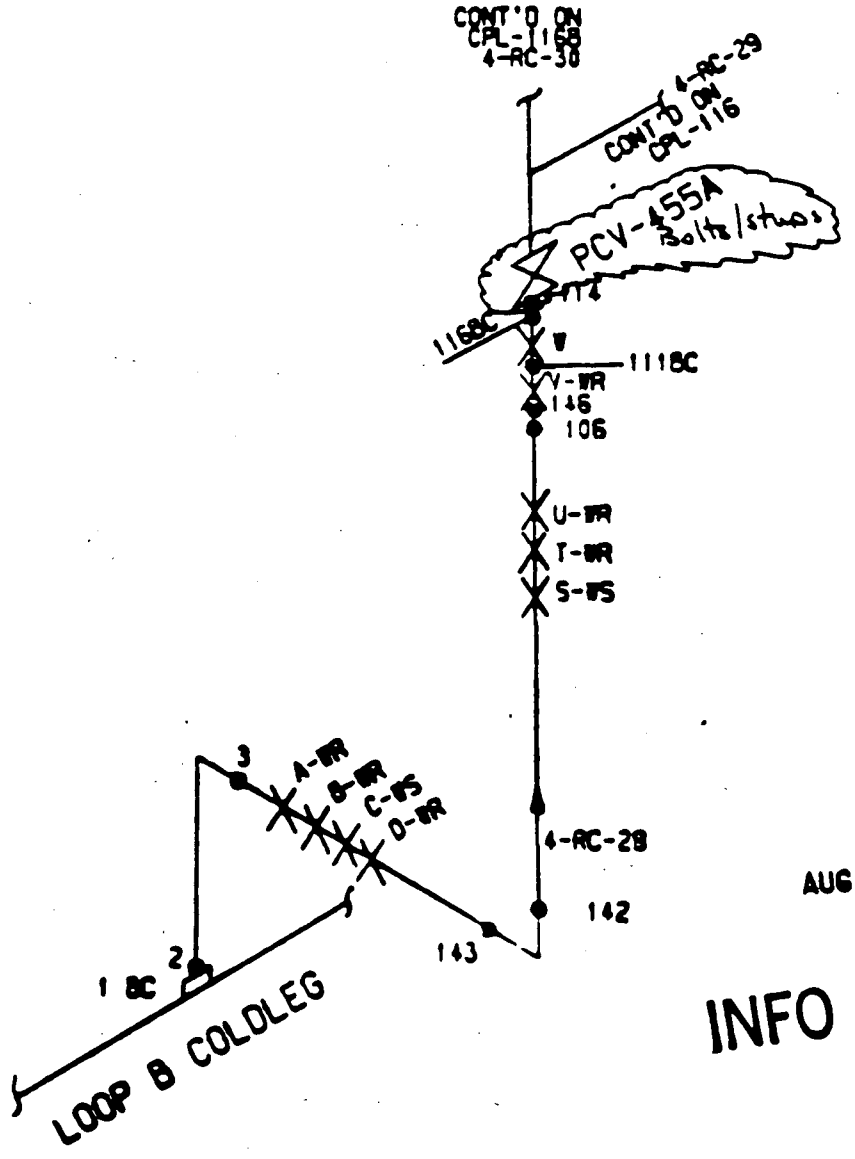
REVIEWERS:
1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/4/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

SPRING HANGERS
C

WELDED SUPPORT
~~S-15~~
~~C-15~~



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. H852-10618 SH 22					
CP & L P.O. No. CPL-31					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLD	CLD	12/12/89

CPL-116A REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION LOOP B-4"SPRAY LINE	
LINE NO. 4-RC-28	CPL-116A REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-012
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: REACTOR COOLANT	Component Name: VALVE BOLTING	Component ID No.: PCV-455A
Class: ONE	Location/Isometric: 228' Elev. - PRESSURIZER / CPL-116A R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
8 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
8 NUTS		✓		✓		✓		✓		✓		✓	✓	
8 WASHERS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

STUDS, NUTS, WASHERS IN PLACE

Examiner: [signature] Level: II Date: 9-21-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: [signature] LEVEL II 9-24-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

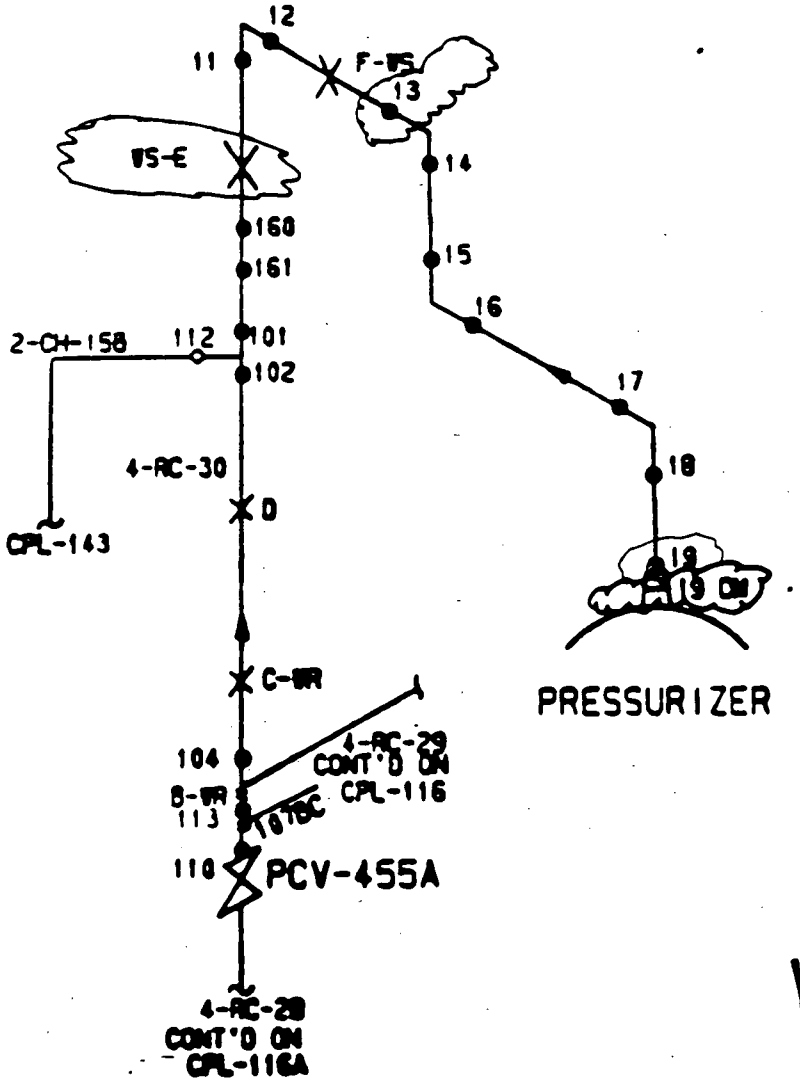
ISI Reviewer: [signature] Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Valladares 9.23.93

SPRING HANGERS
F

WELD SUPPORT
F-85



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. H882-10618 SH.23					
CP & L P.O. No. CPL-SI					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBWL	CP&L	CLO	CLO	12/11/91

CPL-116B REV.0

H.B. ROBINSON S.E. PLANT		CP & L
UNIT NO. 2		
DESCRIPTION LOOPS B&C-4"SPRAY LINE		
LINE NO. 4-RC-30	CPL-116B REV.	

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-099
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: RC	Component Name: Support/Hanger	Component ID: 116B-E
Drawing/Location: CPL-116B R/O		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sim Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/11/93

ANII R. Balladares 10/11/93

DATA SHEET NO. 1217-050
THERMOMETER S/N MR92-04
TEMPERATURE 83 ° F
NOMINAL THICKNESS .531 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. 0
PAGE 1 OF 1

SYSTEM EXAMINED Loops B+C 4" Spray Line ISO/DWG/SK. # CPL-116B REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 13	No Recordable Indications	X	N/A
Weld No. 19	No Recordable Indications	X	N/A
Weld No. 19 DM	No Recordable Indications	X	N/A

EXAMINER C.D. Judd LEVEL II DATE 10-6-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lewis LEVEL III DATE 10-6-93
REVIEWER Richard A. Weber DATE 10/7/93
REVIEWER R. Valladares ANII DATE 10/7/93

DATA SHEET NO. 1223-016
PAGE 1 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #13

INSTRUMENT

Model KRAUTKRAMER USK7
Serial No. 27276-3702
Sweep Length 4.92 Delay 8.06
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 18 dB
Reference Sensitivity 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45°
Measured Angle 42°
Cable Type RG174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.35"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4"
Temperature 94 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = 0.25"
Remarks 2.5" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093057

VERTICAL LINEARITY

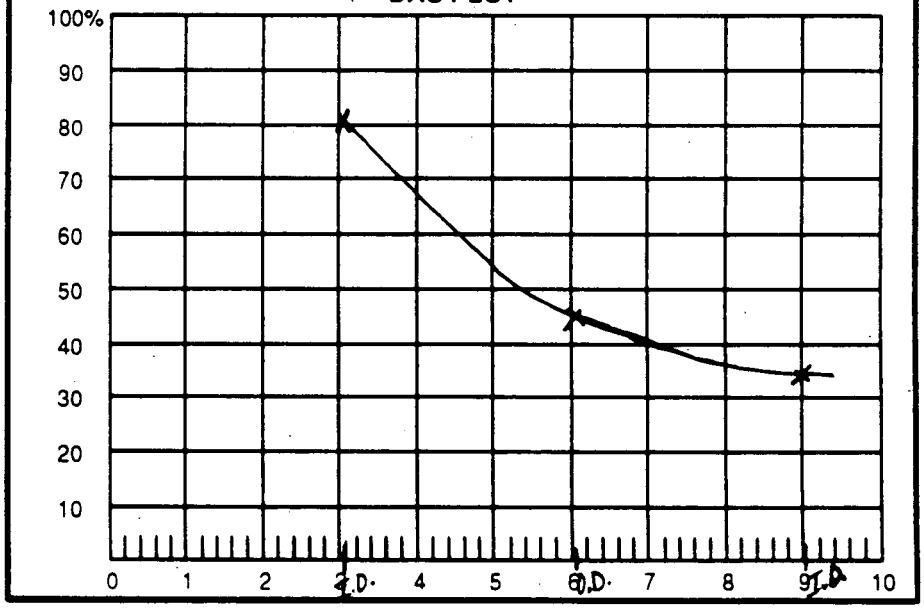
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	80
80	-12	40
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1030
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1800

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10-5-93
2 [signature] LEVEL II DATE 10-5-93
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-016
PAGE 2 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #13

INSTRUMENT

Model KRAUTKRAMER USK7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5
Gain (coarse) 40 dB
Gain (fine) 14 dB
Reference Sensitivity 54 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 42 °
Cable Type RG174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.35"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4"
Temperature 94 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. X
Metal Path X Depth N/A
Each Major Screen Div. = 0.2"
Remarks 2" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

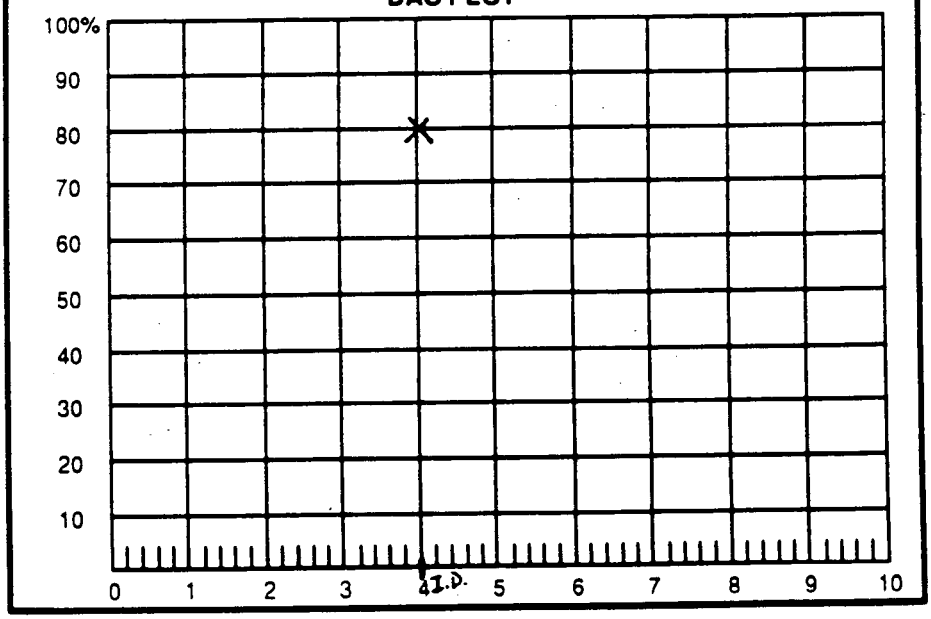
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	77
20	+12	74

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1020
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1755

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10-5-93
2 [signature] LEVEL II DATE 10-5-93
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL ASNT DATE 10/7/93

DATA SHEET NO. 1223-016
PAGE 3 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #13

INSTRUMENT

Model KRAUTKRAMER USK7
Serial No. 27276-784
Sweep Length 8.14 Delay 7.80
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 28 dB
Reference Sensitivity 48 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size 0.25
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG 174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.35"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4"
Temperature 94 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = 0.5"
Remarks 5" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

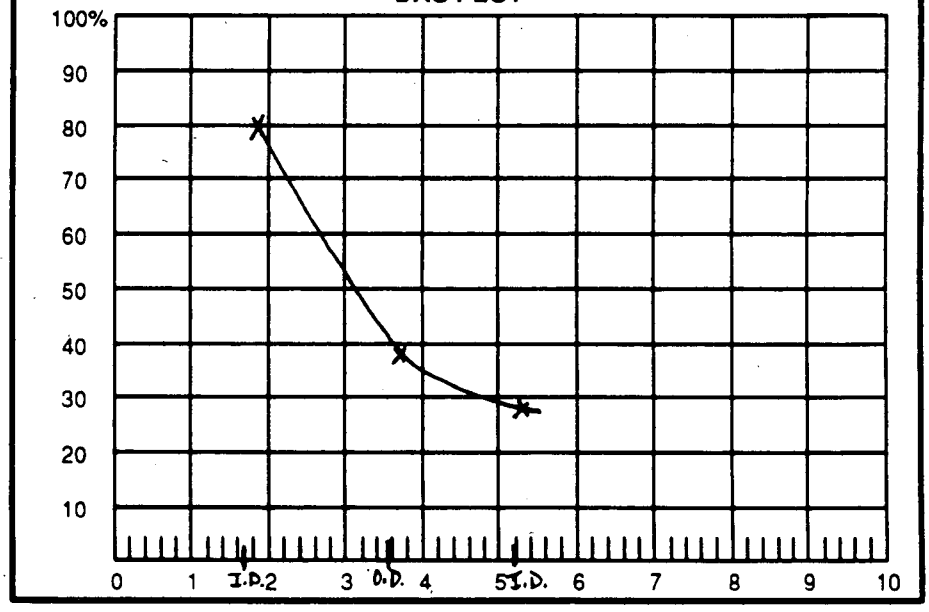
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	78

CAL. CHECKS

	TIME
INITIAL CAL.	1000
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1805

DAC PLOT



REMARKS: N/A

EXAMINERS 1 C. D. Judd LEVEL II DATE 10-5-93
2 Benjamin Sanders LEVEL II DATE 10-5-93
REVIEWERS 1 Scott Long LEVEL III DATE 10-6-93
2 Richard Bickerton LEVEL N/A DATE 10/7/93
3 A. Belladonna LEVEL AWA DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-016
PAGE 41 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #13

INSTRUMENT

Model KRAUTKRAMER, USK7
Serial No. 37276-807
Sweep Length 9.58 Delay 7.36
Range 0.5
Gain (coarse) 40 dB
Gain (fine) 20 dB
Reference Sensitivity 60 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size 0.25
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.35"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4"
Temperature 94 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. X
Metal Path X Depth N/A
Each Major Screen Div. = 0.2
Remarks 9" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

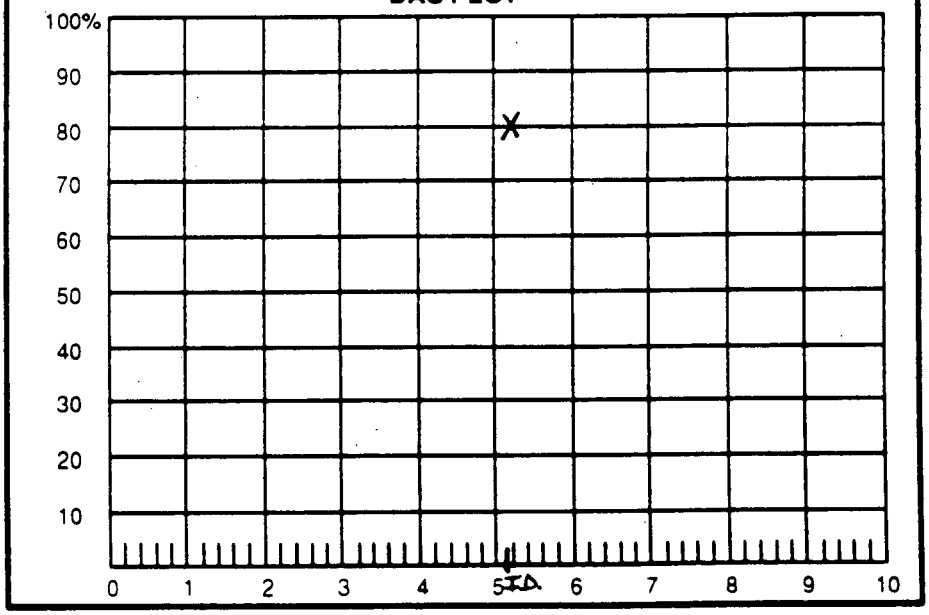
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	77
20	+12	74

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1020
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1750

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10-5-93
2 [signature] LEVEL II DATE 10-5-93
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL ANII DATE 10/7/93

DATA SHEET NO. 1223-016
PAGE 5 OF 7
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOPS B FC 4" SPRAY LINE
ISO/DWG. NO. CPL-1168 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 ° F

WELD #13

SCAN 45 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: ONE SIDED EXAM FROM UPSTREAM SIDE OF WELD, SEE ATTACHED SKETCH

N/A

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: ONE SIDED EXAM FROM UPSTREAM SIDE OF WELD, SEE ATTACHED SKETCH

N/A

SCAN 45 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

N/A

SCAN 60 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

N/A

EXAMINERS:
1 [signature] LEVEL II DATE 10-5-93
2 [signature] LEVEL II DATE 10-5-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL ANII DATE 10/7/93

EXAM ITEM

WELD #13

ISO/DWG. NO.

CPL-116B

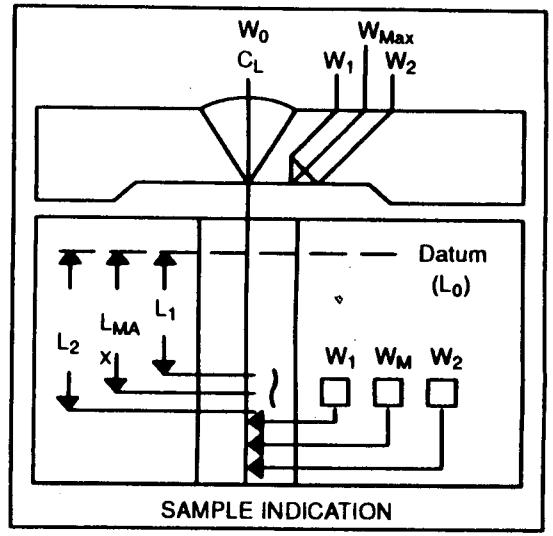
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER N/A

DATA SHEET NO. 1223-016

PAGE 6 OF 7

SEARCH UNIT ANGLE 60 ° W_0 LOCATION WELD CL L_0 LOCATION ELBOW EXTRADOS



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	100%	0.7	1.0	N/A	N/A	N/A	N/A	N/A	3.30	N/A	N/A	US	GEOMETRIC INDICATION INTERMITTENT 360°, SEE ATTACHED SKETCH
						N/A							N/A

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 C. D. Judd LEVEL II DATE 10-5-93

2 Benjamin Snyder LEVEL II DATE 10-5-93

REVIEWERS 1 Scott Lewis LEVEL III DATE 10-6-93

2 Richard B. Weber LEVEL N/A DATE 10/7/93

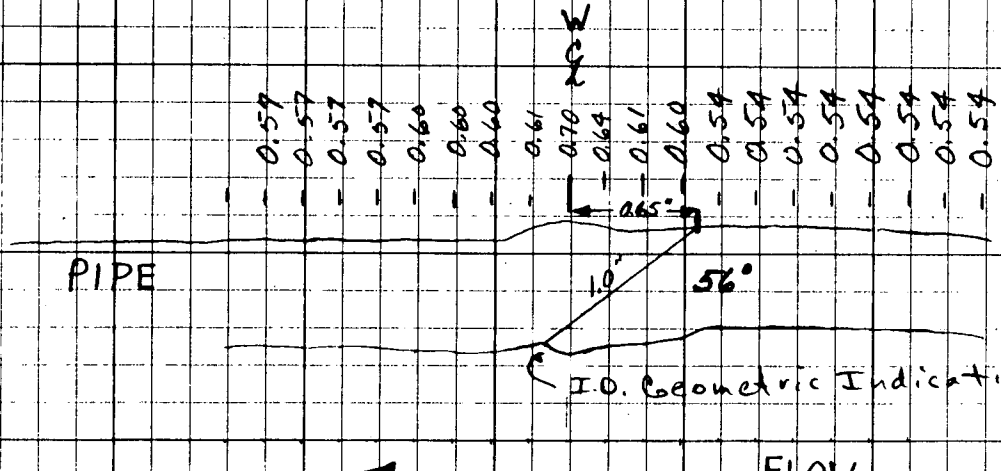
3 [illegible] LEVEL ANII DATE 10/7/93

NES 9-90

NUCLEAR ENERGY SERVICES, INC.

CPL-116B REV. 0

WELD #13



EXAMINER 1. [signature] LEVEL III DATE 10-5-93

2. Benjamin Sanders LEVEL III DATE 10-5-93

PAGE 2 OF 2

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7 of 7

DATA SHEET NO. 1223-032
PAGE 1 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #19

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 8.36 Delay 7.92
Range .5
Gain (coarse) 20 dB
Gain (fine) 26 dB
Reference Sensitivity 46 -3
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .50"
Frequency 5.0 MHz
Mode Long
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" .540" Dia. 4.0"
Temperature 80 ° F
Thermometer S/N

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2"
Remarks: N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

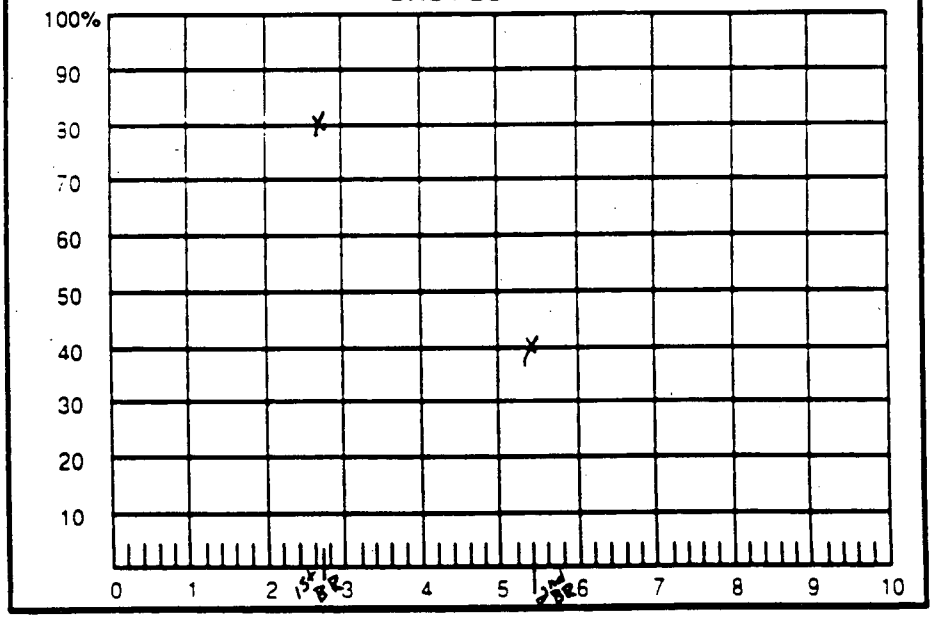
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	82

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1300
INTERMEDIATE	N
INTERMEDIATE	A
INTERMEDIATE	
FINAL CAL.	1540

REMARKS: N/A

EXAMINERS
1 Tim Addison LEVEL II DATE 10-7-93
2 Benjamin Snyder LEVEL II DATE 10-7-93

REVIEWERS
1 Scott D. Lim LEVEL III DATE 10-8-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 JP Balbaosa LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-032
PAGE 2 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #19

INSTRUMENT

Model KRAUTKRAMER, USK7
Serial No. 27276-3784
Sweep Length 9.80 Delay 7.56
Range 0.5
Gain (coarse) 20 dB
Gain (fine) 32 dB
Reference Sensitivity 52 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 43 °
Cable Type RG174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.3"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0"
Temperature 70 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. X
Metal Path X Depth N/A
Each Major Screen Div. = 0.25"
Remarks 2.5 SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

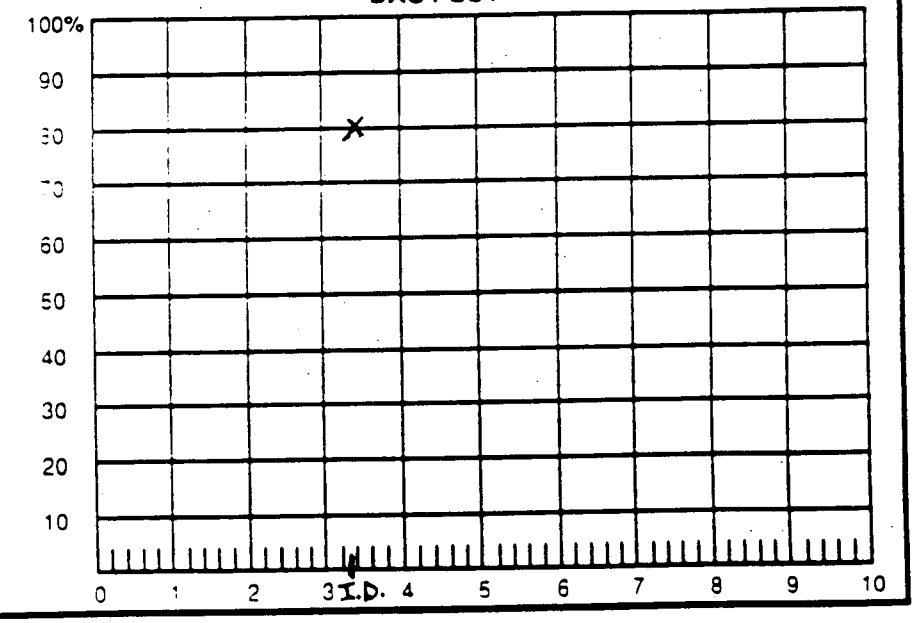
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	21
3	80	40	8	30	16
4	70	10-7-93 35	9	20	10
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1245
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1525

REMARKS: N/A

EXAMINERS 1 Tim Oddom LEVEL II DATE 10-7-93
2 Benjamin Sanders LEVEL II DATE 10-7-93
REVIEWERS 1 [signature] LEVEL III DATE 10-8-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-032
PAGE 3 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #19

INSTRUMENT

Model KRAUTKRAMER, USK7
Serial No. 27276-3702
Sweep Length 8.10 Delay 8.38
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 28 dB
Reference Sensitivity 48 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size 0.25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 57 °
Cable Type RG 174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.35"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. X
Metal Path X Depth N/A
Each Major Screen Div. = 0.5"
Remarks 5" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

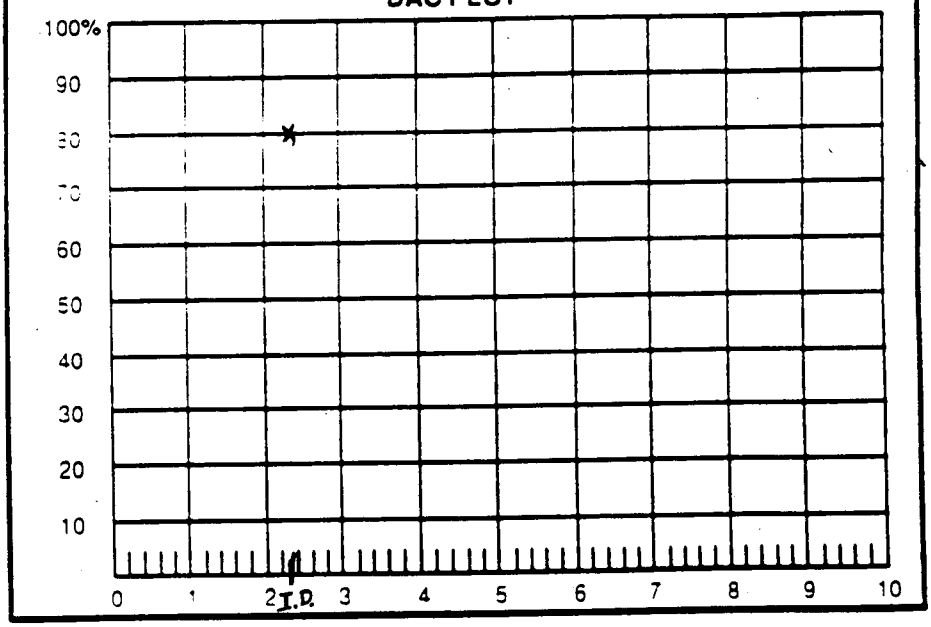
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1250
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1535

DAC PLOT



REMARKS: N/A

EXAMINERS 1 Tim Oldsen LEVEL II DATE 10-7-93
2 Benjamin Sanders LEVEL II DATE 10-7-93
REVIEWERS 1 Scott Kamp LEVEL III DATE 10-8-93
2 Richard Wilder LEVEL N/A DATE 10/11/93
3 R Palladino LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-032
PAGE 4 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD #19

INSTRUMENT

Model KRAUTKRAMER, USK7
Serial No. 27276-3702
Sweep Length 8.10 Delay 8.40
Range 2.5
Gain (coarse) 40 dB
Gain (fine) 12 dB
Reference Sensitivity 52 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 70°
Measured Angle 70°
Cable Type RG 174/U
Cable Length 6'
Remarks: EXIT POINT TO WEDGE TIP 0.5"
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4"
Temperature 65 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial [X] Circ. N/A
Metal Path [X] Depth N/A
Each Major Screen Div. = 0.5"
Remarks 5" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

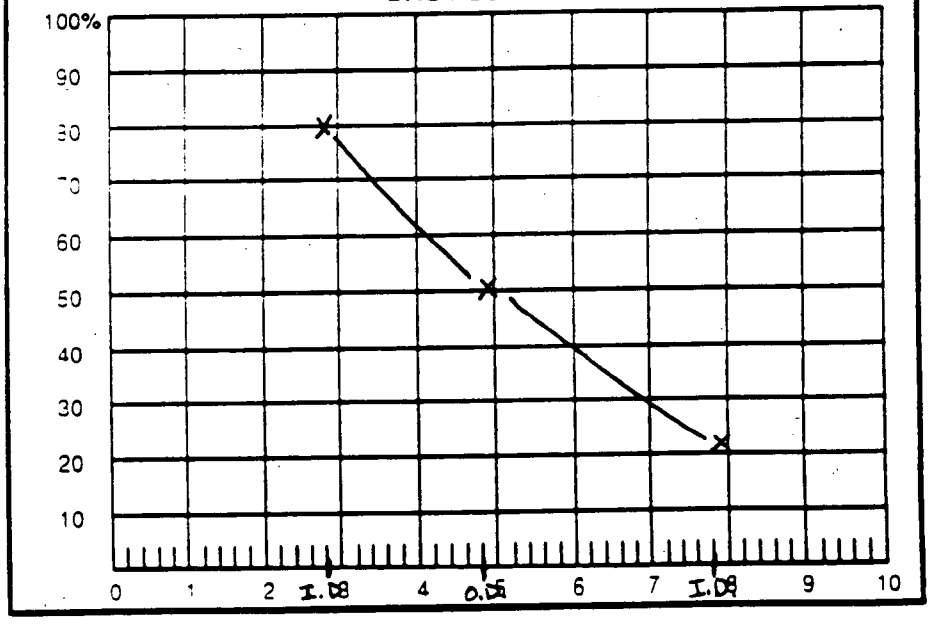
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	10/7/93 BS. 40 20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0800
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1030

REMARKS: N/A

EXAMINERS	1	[signature]	LEVEL III	DATE	10-7-93
	2	[signature]	LEVEL II	DATE	10-7-93
REVIEWERS	1	[signature]	LEVEL N/A	DATE	10/11/93
	2	[signature]	LEVEL ANII	DATE	10/12/93
	3		LEVEL	DATE	

DATA SHEET NO. 1223-032
PAGE 5 OF 7

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Loops B & C 4" SPRAY LINE
ISO/DWG. NO. CPL-116B REV. 0
THERMOMETER S/N JL91-03
COMPONENT TEMP. 80 ° F

EXAM ITEM: WELD #19

SCAN 0 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: ONE SIDED EXAM DUE TO WELD #18. SEE ATTACHED SKETCH.

N/A

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: ONE SIDED EXAM DUE TO WELD #18. SEE ATTACHED SKETCH.

N/A

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: ONE SIDED EXAM DUE TO WELD #18. SEE ATTACHED SKETCH.

N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 Benjamin Sanders LEVEL II (B.S. 10/7/93) DATE 10-7-93
2 Tim Peterson LEVEL II DATE 10-7-93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 R. Balladares LEVEL QN II DATE 10/12/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-032
PAGE 6 OF 7
EXAM ITEM
Weld 19

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Spray line
ISO/DWG. NO. 116R REV. 0
THERMOMETER S/N JL91-03
COMPONENT TEMP. 80 °F

SCAN 70 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: One sided exam due to proximity of weld 18. See attached sketch. Nominal 70° shear wave produced a 56° angle at the ID surface. 45° and 60° axial scans not performed due to transition. See sketch.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Scott LEVEL III DATE 10-7-93
2 LEVEL II DATE 10-7-93

REVIEWERS:
1 LEVEL N/A DATE 10/11/93
2 Walladares LEVEL ANII DATE 10/12/93
3 LEVEL DATE

NES 9/90 - REV. 1
nes NUCLEAR ENERGY SERVICES, INC.

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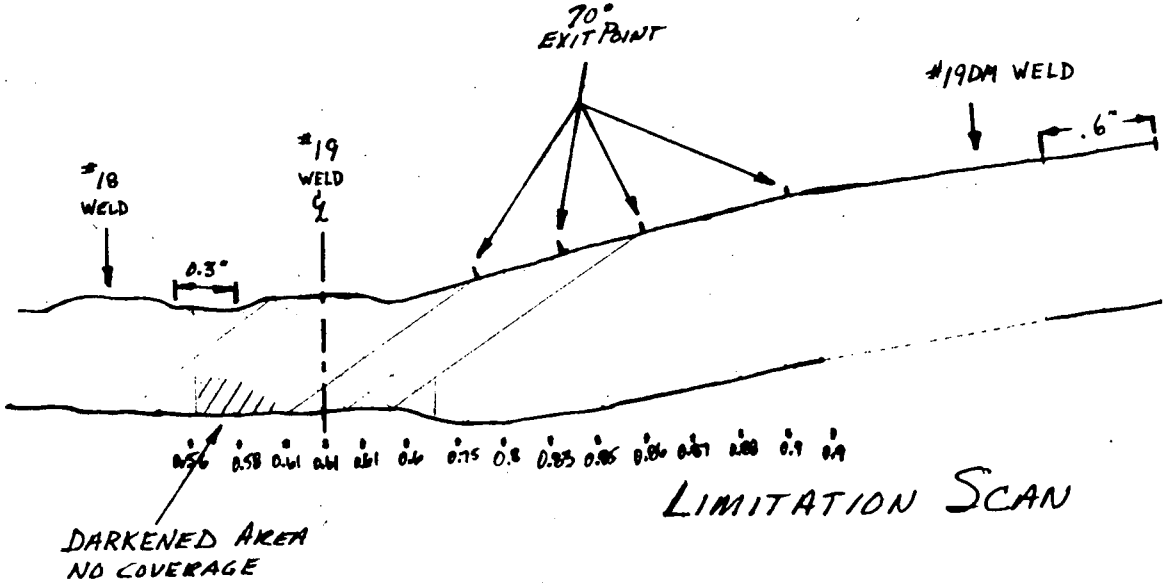
1 of 27



LIMITATION SCAN

DISTANCE FROM EXIT POINT TO WEDGE TIP 0.5"

BEAM ANGLE 56° THROUGH INSPECTION AREA

CPL-116B WELD #19

EXAMINER 1. Tim Oldsen LEVEL II DATE 10-7-93

2. Benjamin Sinden LEVEL II DATE 10-7-93

PAGE ___ OF ___

DATA SHEET NO. 1223-019
PAGE 1 OF 6 & 8 SH 10-8-93

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD#19DM

INSTRUMENT

Model KRAUTKRAMER USK7
Serial No. 97276-749
Sweep Length 8.36 Delay 7.92
Range 0.5
Gain (coarse) 20 dB
Gain (fine) 28 dB
Reference Sensitivity 48 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12911
Size 0.5"
Frequency 5.0 MHz
Mode LONG.
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG 174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT
"T" 0.9" Dia. N/A
Temperature 80 °F
Thermometer S/N JL91-03

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X]
Each Major Screen Div. = 0.2
Remarks 2" SCREEN N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	10
5	60	30	10	10	5

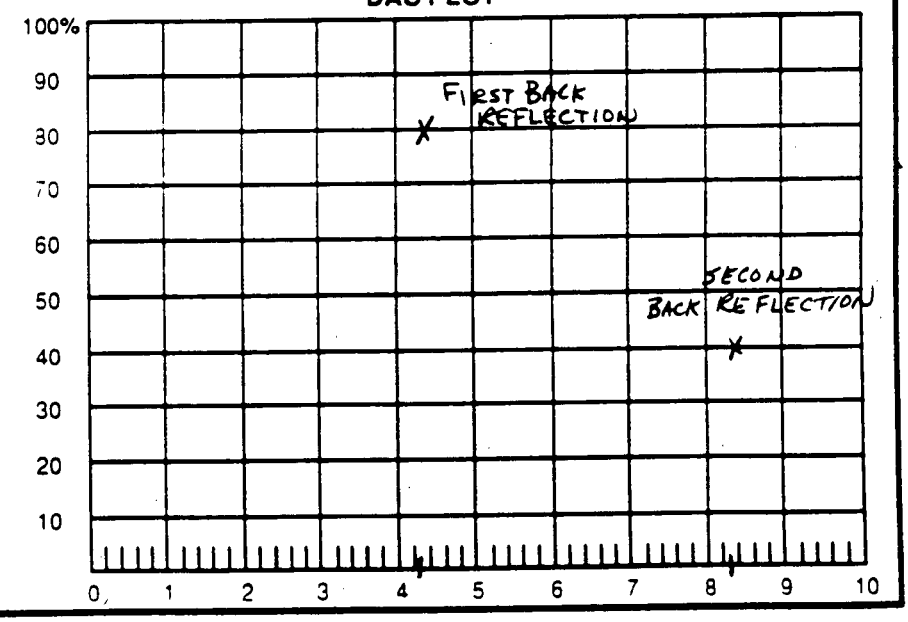
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	82

CAL. CHECKS

	TIME
INITIAL CAL.	1315
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1540

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10-7-93
2 [signature] LEVEL II DATE 10-7-93

REVIEWERS 1 [signature] LEVEL III DATE 10-8-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-019
PAGE 2 OF 6 & 10-8-93

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B Weld # 19Dm

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 9.80 Delay 7.56
Range .5
Gain (coarse) 1 20 / = 20 dB
Gain (fine) 1 18 / = 32 dB
Reference Sensitivity 1 38 / = 52 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 43 °
Cable Type RG174/U
Cable Length 6'
Remarks: .3" Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

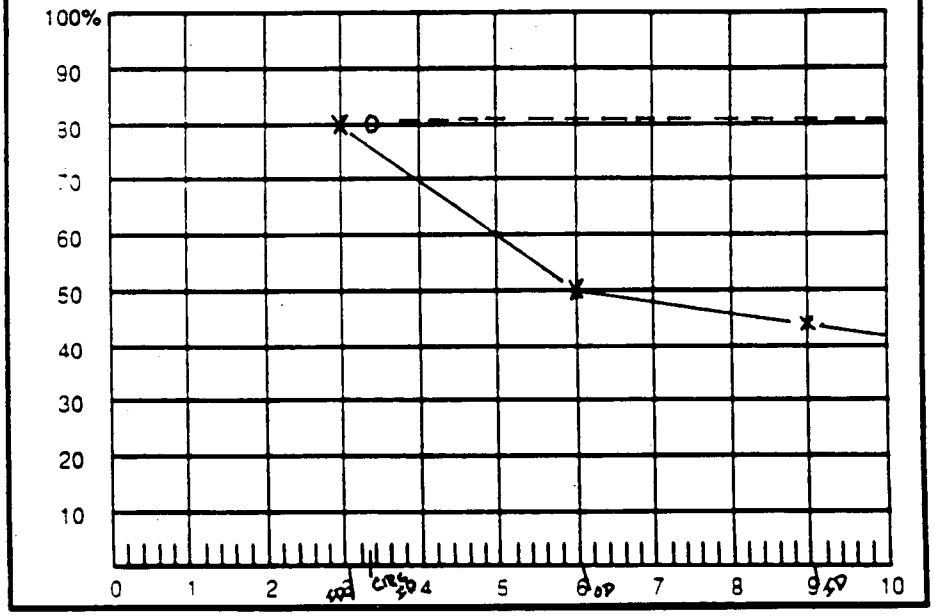
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	21
3	80	40	8	30	16
4	70	35	9	20	10
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1245
INTERMEDIATE	N
INTERMEDIATE	A
INTERMEDIATE	
FINAL CAL.	1525

REMARKS:

EXAMINERS 1 Benjamin Swab LEVEL II DATE 10-7-93
2 Tim Addison LEVEL II DATE 10-7-93

REVIEWERS 1 Scott Jones LEVEL III DATE 10-8-93
2 Richard A. Weber LEVEL N/A DATE 10/11/93
3 R Dallaire LEVEL ANII DATE 10/12/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-019
PAGE 3 OF 6,8 SC 10-8-93

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116 B Weld #19Dm

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.10 Delay 8.38
Range 2.5
Gain (coarse) 1 20 / = 20 dB
Gain (fine) 1 24 / = 28 dB
Reference Sensitivity 1 44 / 48 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 57 °
Cable Type RG 174/U
Cable Length 6'
Remarks: .35" Exit Point to Front of wedge

CALIBRATION BLOCK

No. CPL-24
"T" .526" Dia. 4.0"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .5
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

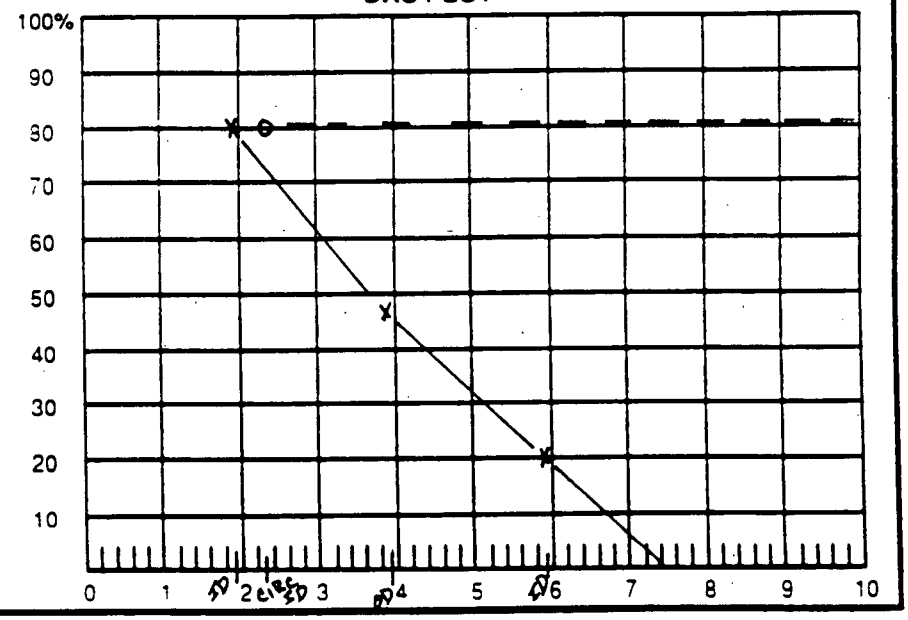
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1250
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1535

REMARKS:

EXAMINERS	1	Benjamin Sude	LEVEL II	DATE	10-7-93
	2	Tom Adkins	LEVEL II	DATE	10-7-93
REVIEWERS	1	Scott Farmer	LEVEL III	DATE	10-8-93
	2	Linda S. Weber	LEVEL N/A	DATE	10/11/93
	3	R Wallace	LEVEL ANII	DATE	10/12/93

DATA SHEET NO. 1223-019
PAGE 4 OF ~~6~~ 8 SL 10-8-93
EXAM ITEM

Weld 19Dm

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC
ISO/DWG. NO. CPL-116B REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 °F

SCAN 0 ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
	N/A	N/A	N/A	N/A		N/A		N/A			N/A

REMARKS: Limited Scan See Attached Sketch

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

EXAMINERS:
1 LEVEL II DATE 10-7-93
2 LEVEL II DATE 10-7-93

REVIEWERS:
1 LEVEL III DATE 10-8-93
2 LEVEL N/A DATE 10/11/93
3 LEVEL ANII DATE 10/12/93

nes NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC
ISO/DWG. NO. CPL-116B REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM

Weld 19 Dm

SCAN 45 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: One Sided Exam See Attached Sketch

SCAN 45 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: One Sided Exam See Attached Sketch

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: One Sided Exam See Attached Sketch

SCAN 60 ° SCAN dB 57				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

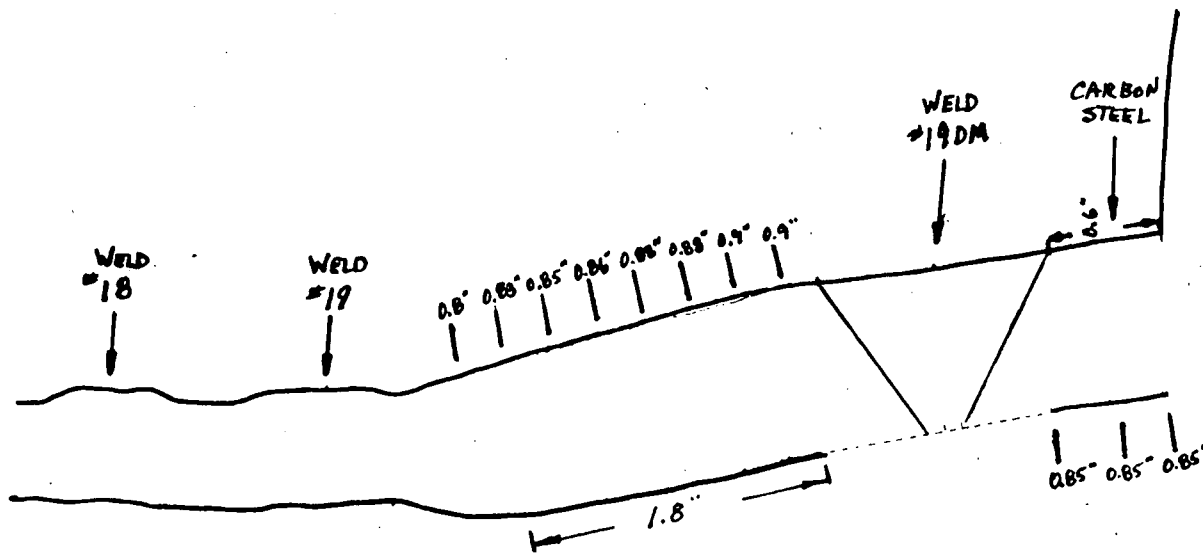
REMARKS: One Sided Exam See Attached Sketch

EXAMINERS:
1 Benjamin Smith LEVEL II DATE 10-7-93
2 Tim Oddson LEVEL III DATE 10-7-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-8-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ASNT II DATE 10/12/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.



----- AREA NO BACK REFLECTION RECEIVED FROM LONG. MODE

SCAN LIMITATION

CPL-116B REV 0

WELD #19DM

EXAMINER 1. Tim Addison LEVEL II DATE 10-7-93

2. Benjamin Sanders LEVEL II DATE 10-7-93

1223-019

SL 10-8-93

DATA SHEET NO. 1223-019
PAGE 7 OF 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-116B WELD 190M

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 8.22 Delay 714
Range .5"
Gain (coarse) 40 dB
Gain (fine) 12 dB
Reference Sensitivity 52 dB
Remarks: N/A

SEARCH UNIT

Serial No. B05236
Size .5"x.5"
Frequency 2.25 MHz
Mode LONG
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526" Dia. 4"
Temperature 72 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial [X] Circ. N/A
Metal Path [X] Depth N/A
Each Major Screen Div. = 2"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

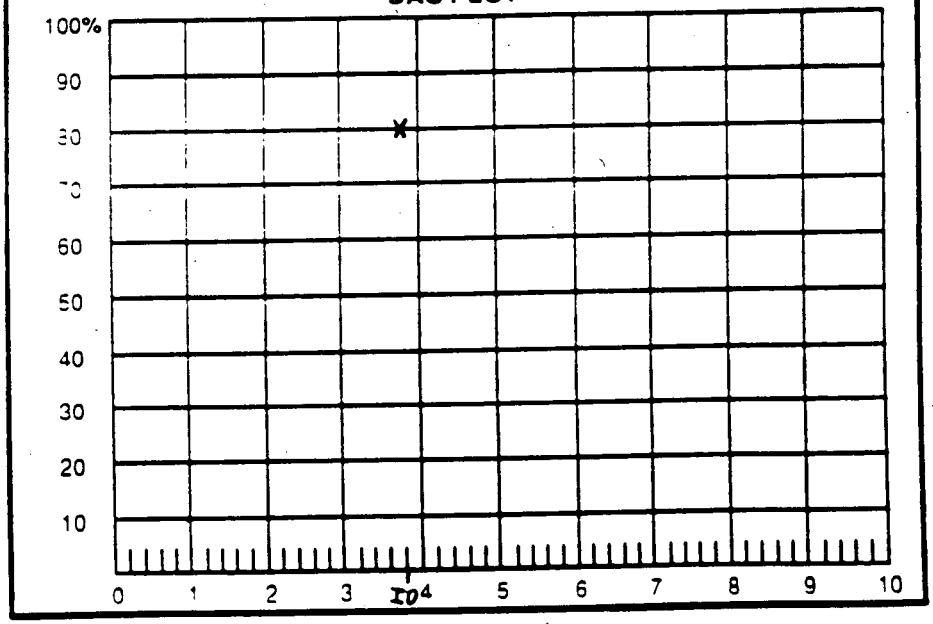
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1440
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1850

REMARKS: ID Notch set at 80% FSH
Supplements Longitudinal wave exam.

EXAMINERS	1	[signature]	LEVEL	III	DATE 10-7-93
	2	Steve Wollum	LEVEL	I	DATE 10-7-93
REVIEWERS	1	[signature]	LEVEL	N/A	DATE 10/11/93
	2	[signature]	LEVEL	AWII	DATE 10/12/93
	3		LEVEL		DATE

DATA SHEET NO. 1223-019
PAGE 8 OF 8
EXAM ITEM

WELD 19DM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC
ISO/DWG. NO. CPL-116B REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

SCAN 45 ° SCAN dB 62				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A		N/A	N/A		N/A	N/A		N/A			N/A

REMARKS: SUPPLEMENTAL 45° REFRACTED LONGITUDINAL EXAMINATION OF BI-METALLIC WELD CONFIGURATION. EXAMINED FROM STAINLESS STEEL SIDE ONLY.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

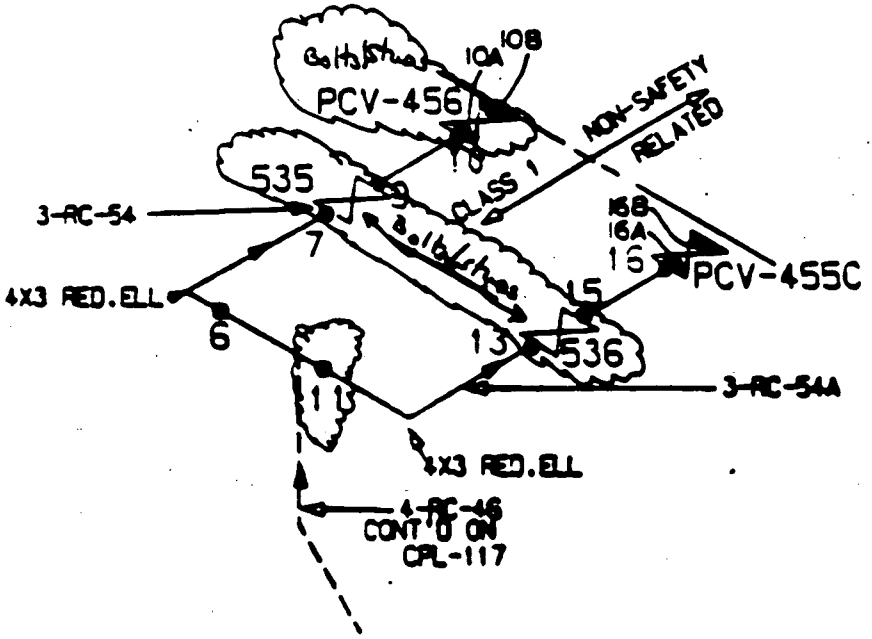
SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

EXAMINERS:
1 Scott LEVEL III DATE 10-7-93
2 Steve Wollum LEVEL I DATE 10-7-93

REVIEWERS:
1 LEVEL N/A DATE 10/11/93
2 R Valladares LEVEL ANII DATE 10/12/9
3 LEVEL DATE

NUCLEAR ENERGY SERVICES, INC.



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-0618 SH 25					
CP & L P.O. No. CPL-91					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/89

CPL-117A REV. 0

H.B. ROBINSON S.E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION 4" PRESSURIZER RELIEF LINE	
LINE NO. 3-RC-54, 54A CPL-117A REV.	

I certify that the image contained on this frame was made

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1230-029
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: RC	Component Name: VALVE BOLTING	Component ID No.: 11TA-RC-PCV456
Class: ONE	Location/Isometric: Top of Pressurizer / CPC 11TA R/O	
Procedure: SP 1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 18% GRAY NEUTRAL CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
6 NUTS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
6 STUDS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: VT-1 performed IN PLACE.

NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: [signature] LEVEL III 10-4-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/5/93

QA NDE ISI 6, Rev. 1, 07/93

ANII [signature] 10-5-93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1230-027
Page 1 of 1

Project Job No. Unit 1 ☐ 2 ☒

System: RC	Component Name: VALVE BOLTING	Component ID No.: 117A-RC-V535
Class: ONE	Location/Isometric: TOP OF PRESSURIZER / CPL-117A R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 18% NEUTRAL X-RAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
14 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
14 NUTS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	✓	✓	↓	↓

Comments/Notes: VT-1 PERFORMED IN PLACE

NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: [signature] LIII 10-4-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 10/5/93

QA NDE ISI 6, Rev. 1, 07/93

ANII [signature] 10/5/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 123-028
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: RC	Component Name: VALVE BOLTING	Component ID No.: 117A-RC-~~V536~~ V536 rs 10-1-93
Class: ONE	Location/Isometric: TOP OF PRESSURIZER / CP117A R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 18% NOMINAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
14 NUTS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
14 STUDS		✓		✓		✓		✓		✓		✓	✓	
~~N~~ A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	✓

Comments/Notes: VT-1 PERFORMED IN PLACE

NO INDICATIONS NOTED

Examiner: Eugene Sing Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: Scott Lam LIII 10-4-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard D. Weber Date: 10/5/93

QA NDE ISI 6, Rev. 1, 07/93

ANII A.P. Valladares 10-5-93

DATA SHEET NO. 1217-048
THERMOMETER S/N JL91-03
TEMPERATURE 82 ° F
NOMINAL THICKNESS .531 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED 4" Pressurizer Relief Line ISO/DWG/SK. # CPL-117 A REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 10A	No Recordable Indications	X	N/A
Weld No. 11	No Recordable Indications	X	N/A
	N A		

EXAMINER Chris D. Judd/CDJ LEVEL II DATE 10-4-93
EXAMINER [signature] LEVEL I DATE 10-4-93
REVIEWER [signature] LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER [signature] DATE 10/5/93

DATA SHEET NO. 1223-015
PAGE 1 OF 7
CPL-117A, REV.0, Weld No. 11

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 4.92 Delay 8.0
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 18 dB
Reference Sensitivity 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. ~~E 24700~~ E24700
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 42 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 0.25
Remarks 2.5" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

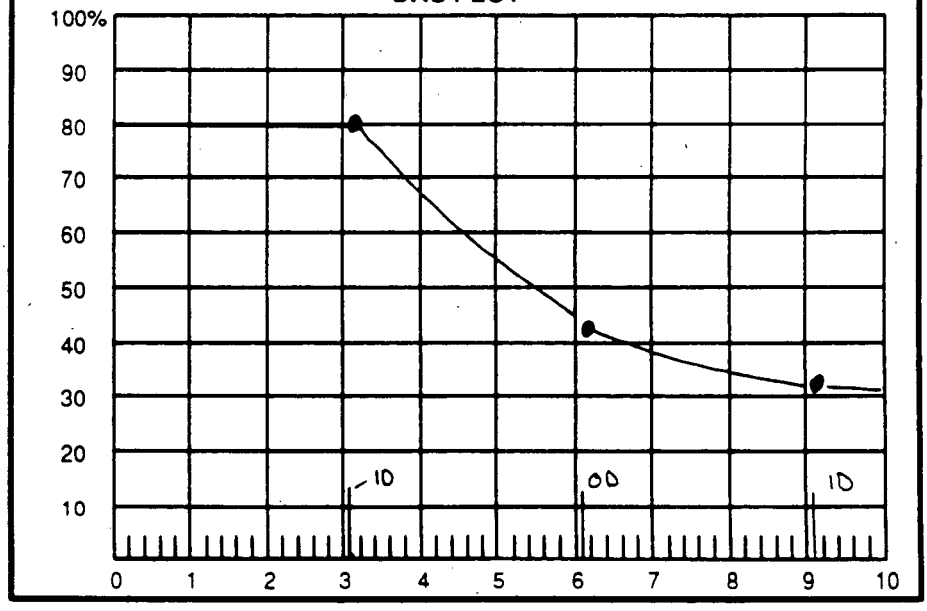
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	19
40	+6	80
20	+12	83

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1500
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2006

REMARKS: N/A

EXAMINERS	1	C. R. Judd	LEVEL II	DATE 10-4-93
	2	[signature]	LEVEL II	DATE 10-4-93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-6-93
	2	[signature]	LEVEL N/A	DATE 10/7/93
	3	[signature]	LEVEL ANII	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-015
PAGE 2 OF 7
CPL-117A REV.0, Weld No. 11

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5
Gain (coarse) 40 dB
Gain (fine) 14 dB
Reference Sensitivity 54 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 42 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2
Remarks 2" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. ~~093057~~ 093051

VERTICAL LINEARITY

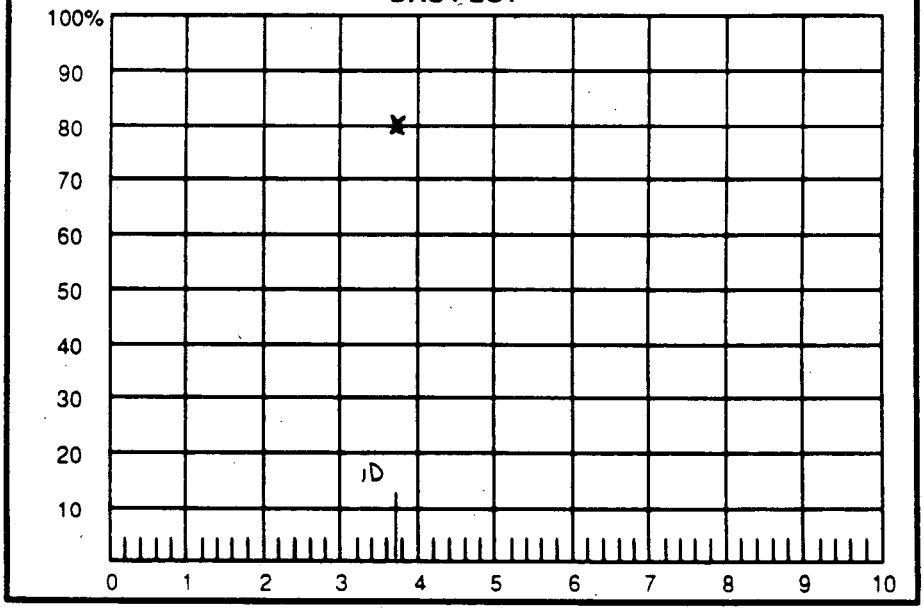
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2010

REMARKS: N/A

EXAMINERS	1	C R Dodd	LEVEL	II	DATE 10-4-93
	2	Benjamin Sanders	LEVEL	II	DATE 10-4-93
REVIEWERS	1	[illegible]	LEVEL	III	DATE 10-6-93
	2	Richard A. Weber	LEVEL	N/A	DATE 10/7/93
	3	A Palladares	LEVEL	ANII	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-015
PAGE 3 OF 7
CPL-117A REV.0, Weld No. 11

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-787
Sweep Length 7.35 Delay 7.73
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 30 dB
Reference Sensitivity 50 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .4
Remarks 4" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

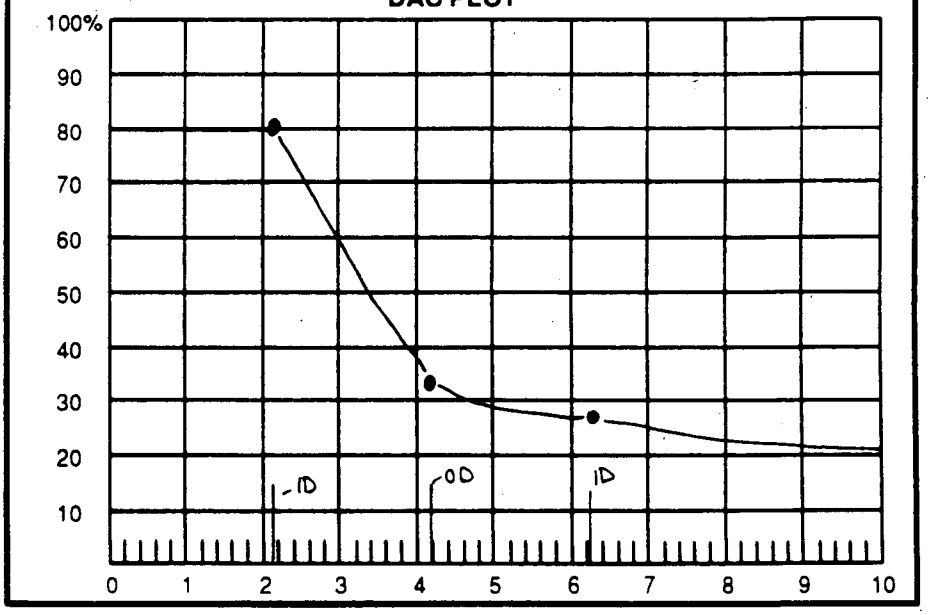
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	76

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1548
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2008

DAC PLOT



REMARKS: N/A

EXAMINERS 1 D. Judd LEVEL II DATE 10-4-93
2 Benjamin Sadler LEVEL II DATE 10-4-93

REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 A Valladares LEVEL AN II DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-015
PAGE 4 OF 7
CPL-117A REV. 0, Weld No. 11

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5"
Gain (coarse) 40 dB
Gain (fine) 20 dB
Reference Sensitivity 60 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2
Remarks 2" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. ~~093057~~ 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

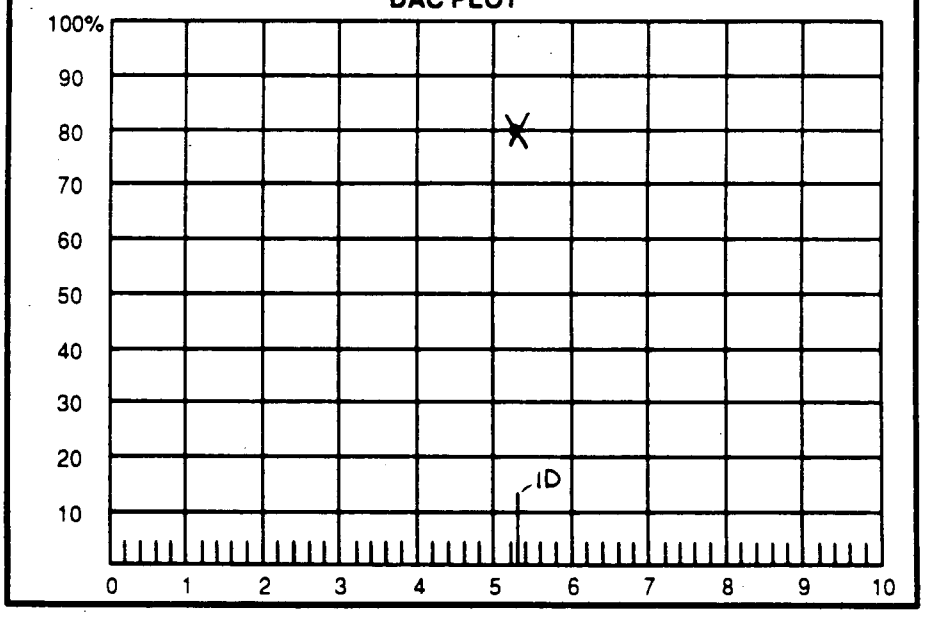
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2012

DAC PLOT



REMARKS: N/A

EXAMINERS	1	C. D. Judd	LEVEL	II	DATE 10-4-93
	2	Benjamin Sanders	LEVEL	II	DATE 10-4-93
REVIEWERS	1	Scott Lamp	LEVEL	III	DATE 10-6-93
	2	Richard B. Weber	LEVEL	N/A	DATE 10/7/93
	3	R. Balladares	LEVEL	AWN	DATE 10/7/93

DATA SHEET NO. 223-015
PAGE 5 OF 7

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 4" Pressurizer Relief Line
ISO/DWG. NO. CPL-117A REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 °F

EXAM ITEM

Weld No. 11

SCAN 45 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Weld scan done on one side of weld only, Pipe side

N A

SCAN 60 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Weld scan done on one side of weld only, Pipe side

N A

SCAN 45 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Weld scan done on one side of weld only, Pipe side

N A

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: Weld scan done on one side of weld only, Pipe side
See attached sketch for profile

N A

EXAMINERS:
1 C.D. Judd LEVEL II DATE 10-4-93
2 Benjamin Snider LEVEL II DATE 10-4-93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-6-93
2 Richard B. Walker LEVEL N/A DATE 10/7/93
A Palladares LEVEL ANII DATE 10/7/93

EXAM ITEM

Weld No. 11

ISO/DWG. NO.

CPL-117A REV.0

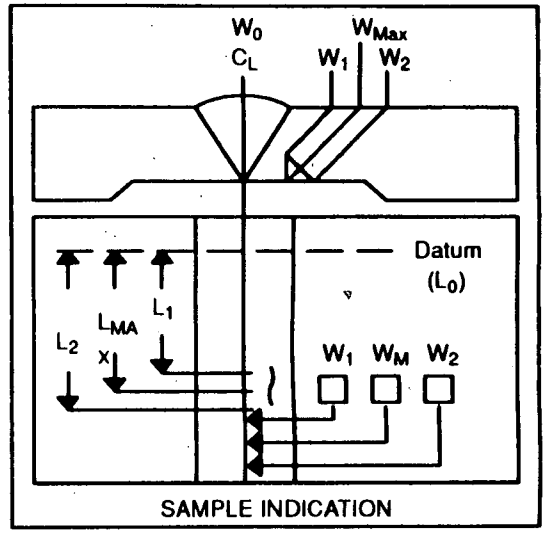
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-015

PAGE 6 OF 7

SEARCH UNIT ANGLE 60 ° W_0 LOCATION C_L of Weld L_0 LOCATION Pipe Extradose



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	65%	.95	1.2	N/A	N/A	N/A	N/A	N/A	3.9	N/A	N/A	D.S.	See attached sketch for profile
							N/A						Weld scan on one side of weld only, pipe side.
													N/A

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 C. D. Judd LEVEL II DATE 10.4.93

2 [signature] LEVEL II DATE 10-4-93

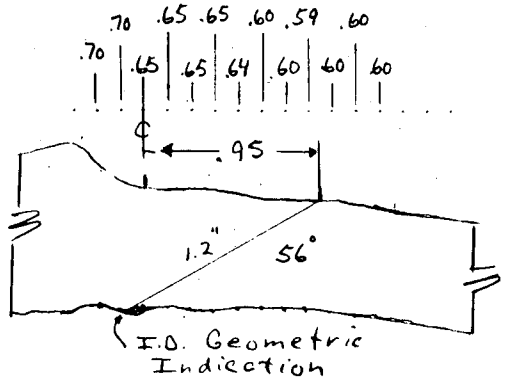
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93

2 [signature] LEVEL N/A DATE 10/7/93

3 [signature] LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

CPL-117A
Weld No. 11



Tee

Pipe

Downstream

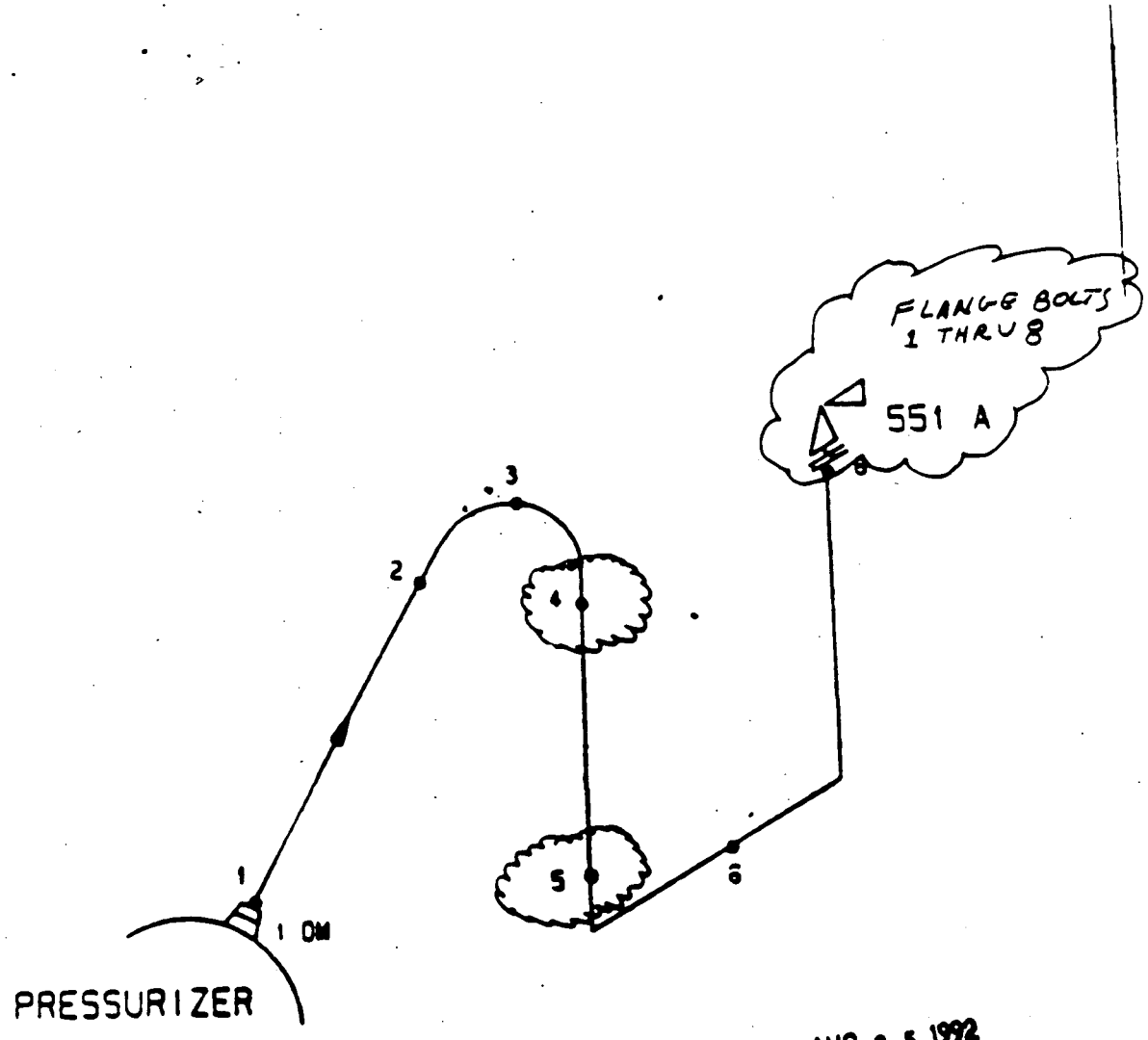
Examiner: [signature] Level: II Date: 10-4-93

Examiner: [signature] Level: II Date: 10-4-93

Reviewed: [signature] LIII 10-6-93

1223-015

7 of 7



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. H887-10618 SH 26					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHECKED BY	APPD BY	DATE
0	RBW	CPL	CLO	CLO	12/12/89

CPL-118 REV. 0

H.B. ROBINSON S.E. PLANT		CP & L
UNIT NO. 2		
DESCRIPTION 4" PRESSURIZER SAFETY LINE		
LINE NO. 4-RC-42	CPL-118 REV.	

I certify that the image contained on this frame was made

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-016
Page 1 of 1

Project HBR2 Job No. Unit 1☒ 2☐

System: PRESSURIZER	Component Name: FLANGE	Component ID No.: 551A
Class: 1	Location/Isometric: CPL-118	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes N/A No ☒	Direct ☒ Remote N/A	Video Recording No: N/A
Equipment Used: FLASHLIGHT, MIRROR, NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
FLANGE NUTS UPSTREAM (1-8)	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	N/A	X	X	N/A
FLANGE NUTS DOWNSTREAM (1-8)		X		X		X		X		X		X	X	
FLANGE STUDS (1-8)		X		X		X		X		X		X	X	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes:
NO INDICATIONS NOTED

Examiner: Kenneth A. Hane Level: II Date: 10-4-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: Scott Lane LIII 10-5-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are [illegible]
☑ Pass (EER, FWR, Etc. - If Applicable)
☐ Fail (INOF - Unsat.)

ISI Reviewer: Richard B. Weber 10/5/93

NDE ISI 6, Rev. 1, 07/93

ANII RP Valladares 10/5/93

DATA SHEET NO. 1217-047
THERMOMETER S/N Jb91-03
TEMPERATURE 82 ° F
NOMINAL THICKNESS .531 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED 4" Pressurizer Safety Line ISO/DWG/SK. # CPL-118 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 4	No Recordable Indications	X	N/A
Weld No. 5	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd /cl D. Judd LEVEL II DATE 10-4-93
EXAMINER [signature] LEVEL I DATE 10-4-93
REVIEWER [signature] LEVEL III DATE 10-4-93
REVIEWER [signature] DATE 10/5/93
REVIEWER [signature] DATE 10/5/93

DATA SHEET NO. 1223-014
PAGE 1 OF 27 10-6-93
CPL-118 REV.0 Weld No. 4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5
Gain (coarse) 40 dB
Gain (fine) 20 dB
Reference Sensitivity 60 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60°
Measured Angle 56°
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0"
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2
Remarks 2" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

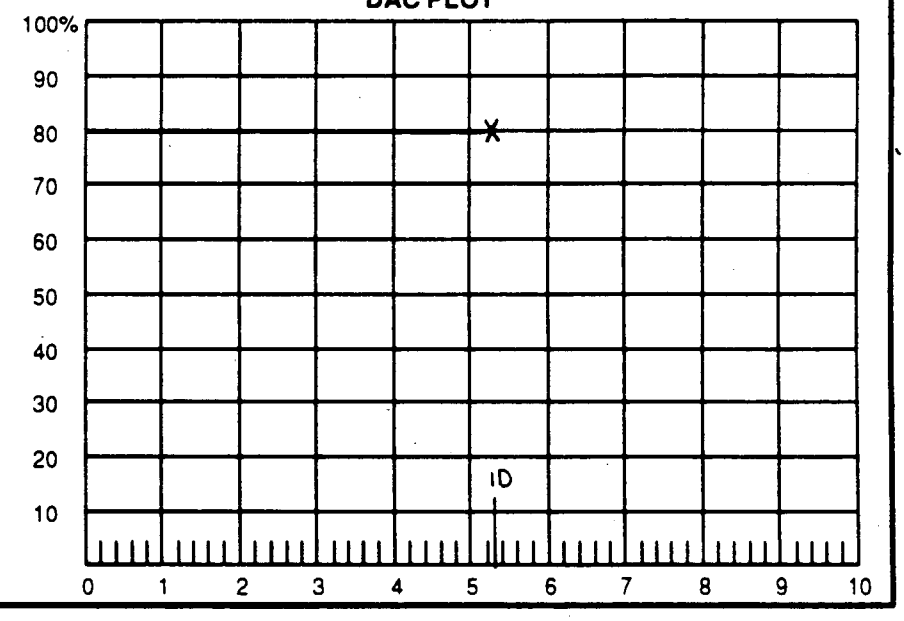
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2012

REMARKS: N/A

EXAMINERS	1		LEVEL II	DATE 10-4-93
	2		LEVEL II	DATE 10-4-93
REVIEWERS	1		LEVEL III	DATE 10-6-93
	2		LEVEL N/A	DATE 10/7/93
	3		LEVEL AN II	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-014
PAGE 2 OF 27 10-6-93
CPL-118 REV. 0, Weld No. 4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5"
Gain (coarse) 40 dB
Gain (fine) 14 dB
Reference Sensitivity 54 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 42 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2
Remarks 2" Screen Range
N/A

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

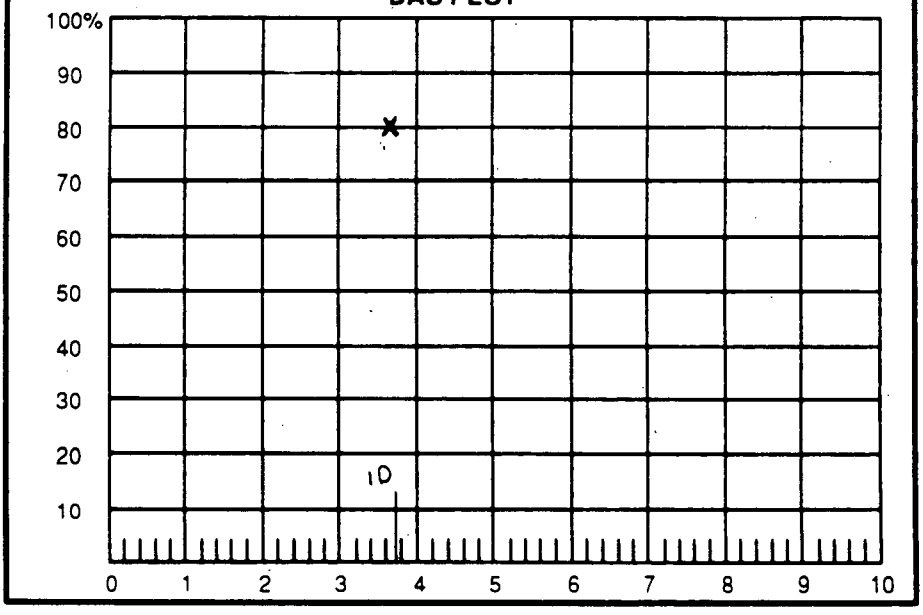
COUPLANT

Brand ULTRAGEL II
Batch No. C3-4-93 ~~093057~~ 093051

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2010

REMARKS: N/A

EXAMINERS	1	D. Judd	LEVEL	II	DATE 10-4-93
	2	[illegible]	LEVEL	II	DATE 10-4-93
REVIEWERS	1	[illegible]	LEVEL	III	DATE 10-6-93
	2	[illegible]	LEVEL	N/A	DATE 10/7/93
	3	[illegible]	LEVEL	AN II	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-014
PAGE 3 OF #7 10-6-93
CPL-118 REV. 0, Weld No. 4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 4.92 Delay 8.0
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 18 dB
Reference Sensitivity 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. E2470D E24700
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 42 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 0.25
Remarks 2.5" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

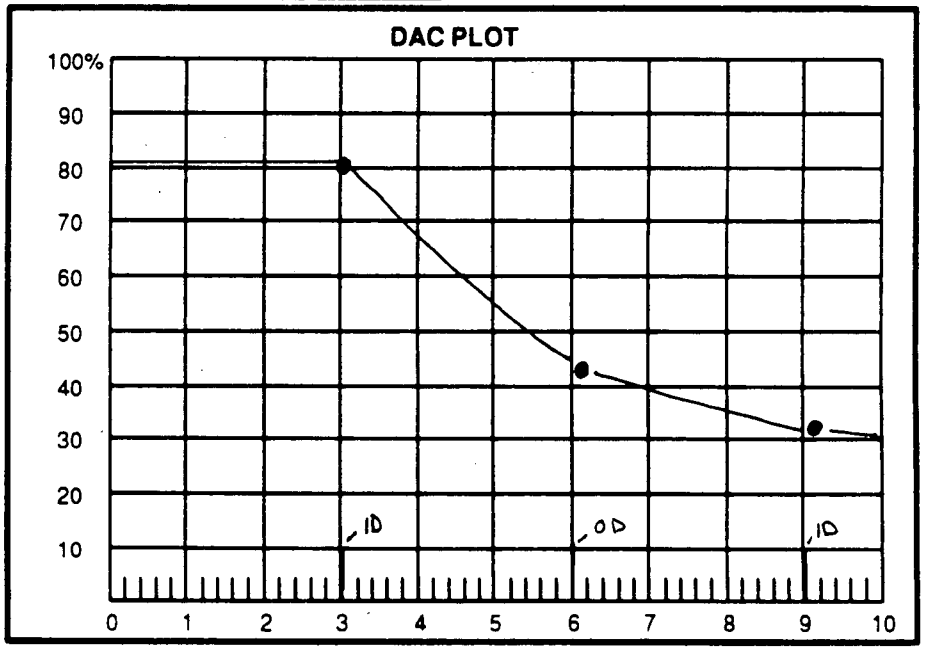
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	19
40	+6	80
20	+12	83

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1500
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2006

REMARKS: N/A

EXAMINERS	1	C D. Judd	LEVEL	II	DATE 10.4-93
	2	Benjamin Snyder	LEVEL	II	DATE 10-4-93
REVIEWERS	1	Scott Lam	LEVEL	III	DATE 10-6-93
	2	Richard B Weber	LEVEL	N/A	DATE 10/7/93
	3	R Maddaus	LEVEL	4N11	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-014
PAGE 4 OF ~~8~~ 7 10-6-93
CPL-118 REV.0, Weld No.4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-787
Sweep Length 7.35 Delay 7.73
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 30 dB
Reference Sensitivity 50 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point: 35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial X Circ. N/A
Metal Path X Depth N/A
Each Major Screen Div. = .4
Remarks 4" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

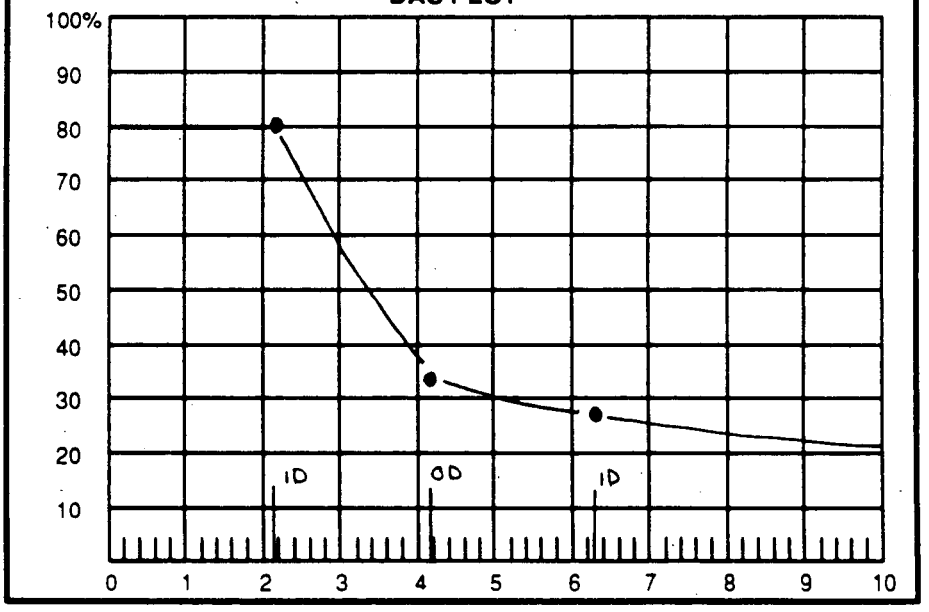
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	76

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1548
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2008

REMARKS: N/A

EXAMINERS	1	C. D. Judd	LEVEL II	DATE 10-4-93
	2	Eugene Sachs	LEVEL II	DATE 10-4-93
REVIEWERS	1	Scott Lamm	LEVEL III	DATE 10-6-93
	2	Richard B. Weber	LEVEL N/A	DATE 10/7/93
	3	A. Valladares	LEVEL AN II	DATE 10/7/93

DATA SHEET NO. 1223-014

PAGE 5 OF 6 8 7 (54-6-93)

EXAM ITEM

Weld No. 4

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 4" Pressurizer Safety Line

ISO/DWG. NO. CPL-118 REV. 0

THERMOMETER S/N 962

COMPONENT TEMP. 82 °F

SCAN 45 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: See attached sketch for profile

N/A

EXAMINERS:

1 C. D. Judd LEVEL II DATE 10-4-93

2 Benjamin Sinden LEVEL II DATE 10-4-93

REVIEWERS:

1 Scott Lang LEVEL III DATE 10-6-93

2 Richard O. Weber LEVEL N/A DATE 10/7/93

3 R. Walladares LEVEL ANII DATE 10/7/93

EXAM ITEM

Weld No. 4

ISO/DWG. NO.

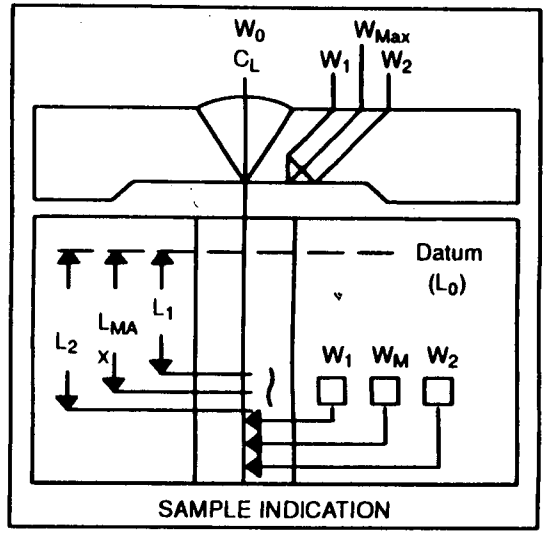
CPL-118 REV. 0

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-014

PAGE 76 OF 87 (5 of 10-6 #3)



SAMPLE INDICATION

SEARCH UNIT ANGLE 60 ° W_0 LOCATION C_L of Weld L_0 LOCATION Pipe Extradose

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind.	%	W	MAX	FWD 50%	FWD DAC*	BACKWARD 50%	BACKWARD DAC*	L_1	L	L_2	RBR	S.U.	REMARKS
No.	of DAC*	W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	65%	.75	.90	N/A	N/A	N/A	N/A	N/A	5.85	N/A	N/A	D.S.	See attached sketch for profile
							N						
								A					
													N
													A

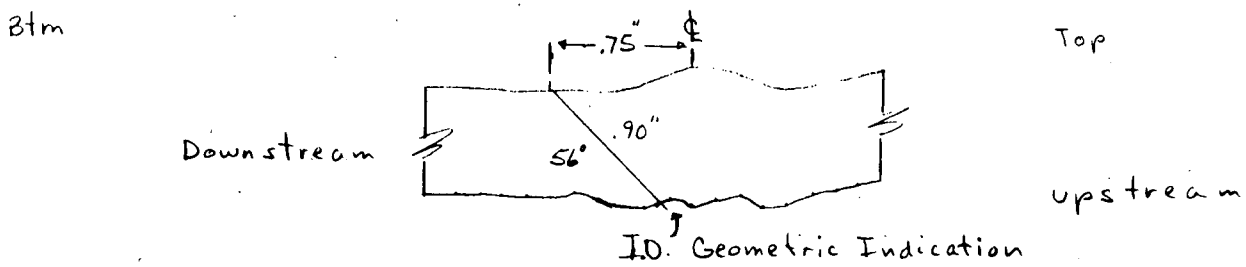
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	C. D. Judd	LEVEL II	DATE 10.4.93
	2	Benjamin Snyder	LEVEL II	DATE 10-4-93
REVIEWERS	1	Scott Lang	LEVEL III	DATE 10.6.93
	2	Richard D. Weber	LEVEL N/A	DATE 10/7/93
	3	A Wallace	LEVEL AUII	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

CPL-118 REV. 0
Weld No. 4

.55 .55 .55 .57 .66 .72 64 61 58 58 58
.55 .55 .55 .66 67 70 64 58 58 58 58



Examiner: C.D. Judd Level: II Date: 10.4.93

Examiner: Benjamin Sanders Level: II Date: 10-4-93

1223-004 SC 10-6-93
8 of 8
OF 7 SC 10-6-93

DATA SHEET NO. 1223-013
PAGE 1 OF 7
CPL-118 REV. 0, Weld No. 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 4.92 Delay 8.0
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 18 dB
Reference Sensitivity 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. ~~E24700~~ E24700
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 42 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 0.25
Remarks 2.5" Screen Range
N/A

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	6

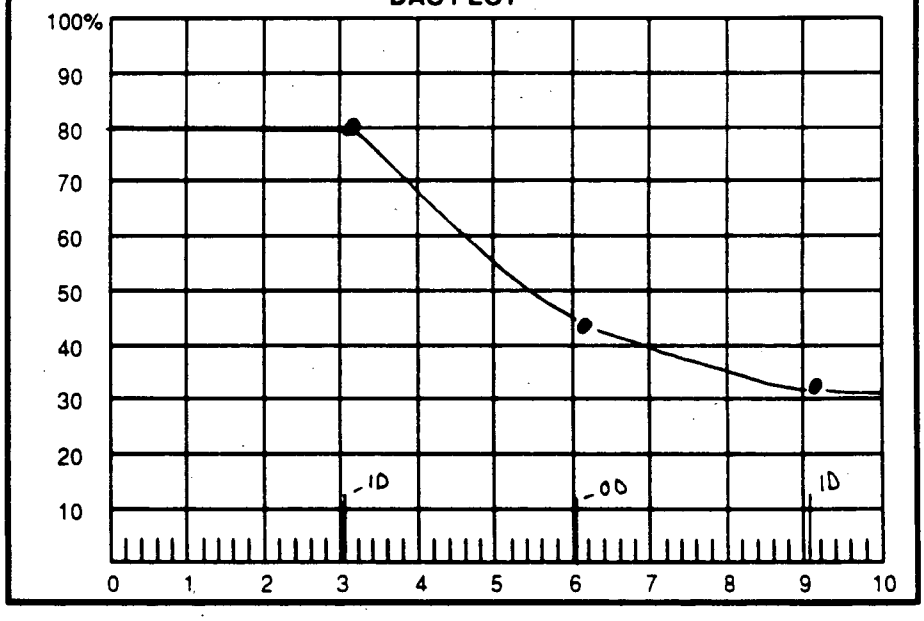
COUPLANT

Brand ULTRAGEL II
Batch No. 093051

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	19
40	+6	80
20	+12	83

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1500
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2006

REMARKS: N/A

EXAMINERS	1	C. D. Jagla	LEVEL	II	DATE 10-4-93
	2	Benjamin Snyder	LEVEL	II	DATE 10-4-93
REVIEWERS	1	Scott Jones	LEVEL	III	DATE 10-6-93
	2	Richard B. Weber	LEVEL	N/A	DATE 10/7/93
	3	D. Palladares	LEVEL	ANII	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-013
PAGE 2 OF 7
CPL-118 REV.0, Weld No.5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5"
Gain (coarse) 40 dB
Gain (fine) 14 dB
Reference Sensitivity 54 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size 0.25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle C3.4 ~~43~~ 42 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2
Remarks 2" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. C3.4 ~~893057~~ 093051

VERTICAL LINEARITY

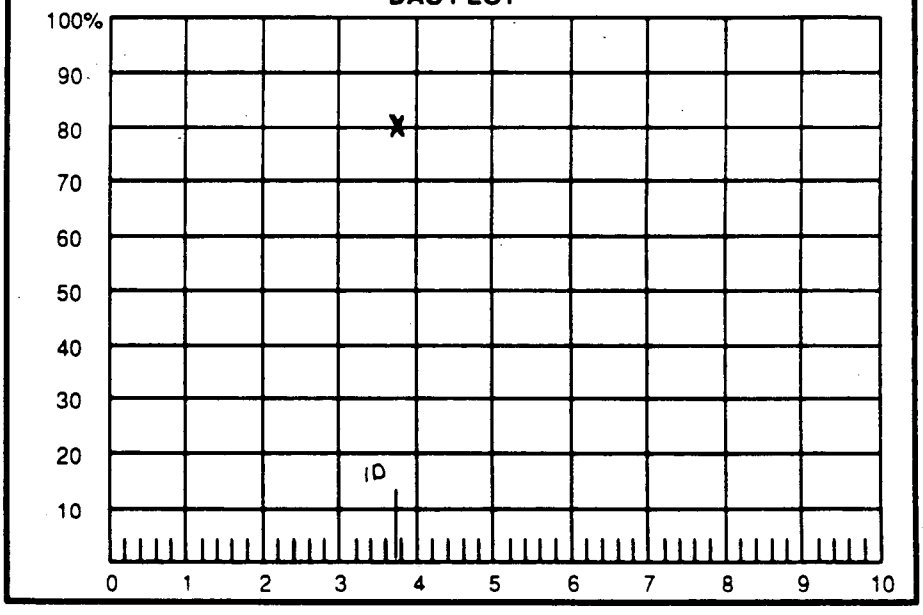
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2010

REMARKS: N/A

EXAMINERS 1 C. D. Judd LEVEL II DATE 10-4-93
2 Benjamin Singh LEVEL II DATE 10-4-93
REVIEWERS 1 Scott Kerr LEVEL III DATE 10-6-93
2 Richard B. Weber LEVEL N/A DATE 10/7/93
3 G. Balladares LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-013
PAGE 3 OF 7
CPL-118 REV.0, Weld No.5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-787
Sweep Length 7.35 Delay 7.73
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 30 dB
Reference Sensitivity 50 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge. N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .4
Remarks 4" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

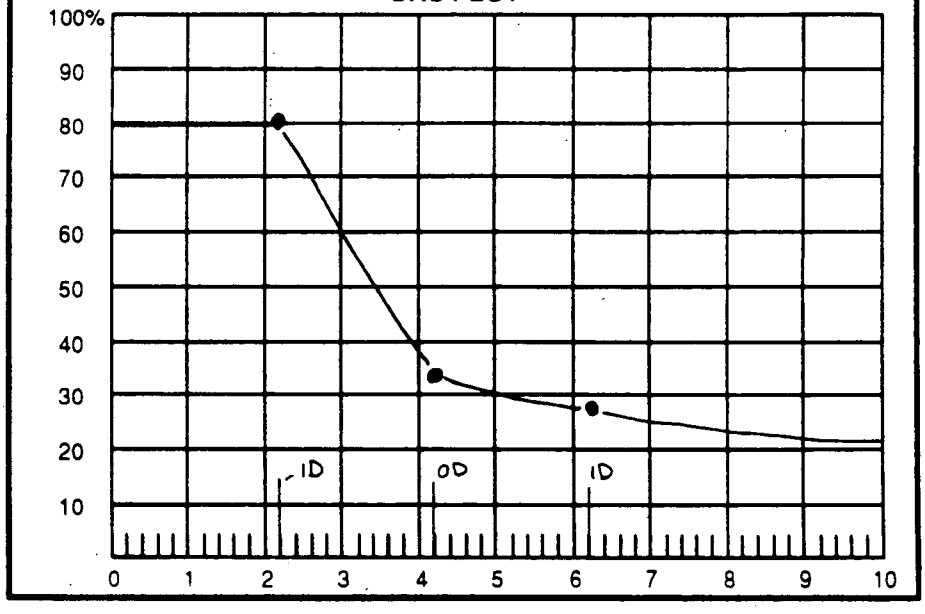
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	76

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1548
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2008

DAC PLOT



REMARKS: N/A

EXAMINERS 1 C D. Judd LEVEL II DATE 10-4-93
2 Benjamin Judd LEVEL II DATE 10-4-93
REVIEWERS 1 Scott Lam LEVEL III DATE 10-6-93
2 Richard B. Weber LEVEL N/A DATE 10/7/93
3 A Williadsen LEVEL AUII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-013
PAGE 4 OF 7
CPL-118 REV. 0, Weld No. 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-807
Sweep Length 9.58 Delay 7.36
Range 0.5"
Gain (coarse) 40 dB
Gain (fine) 20 dB
Reference Sensitivity 60 dB
Remarks: N/A

SEARCH UNIT

Serial No. K05973
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 56 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-24
"T" .526 Dia. 4.0
Temperature 92 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 2
Remarks 2" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. ~~093057~~ 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

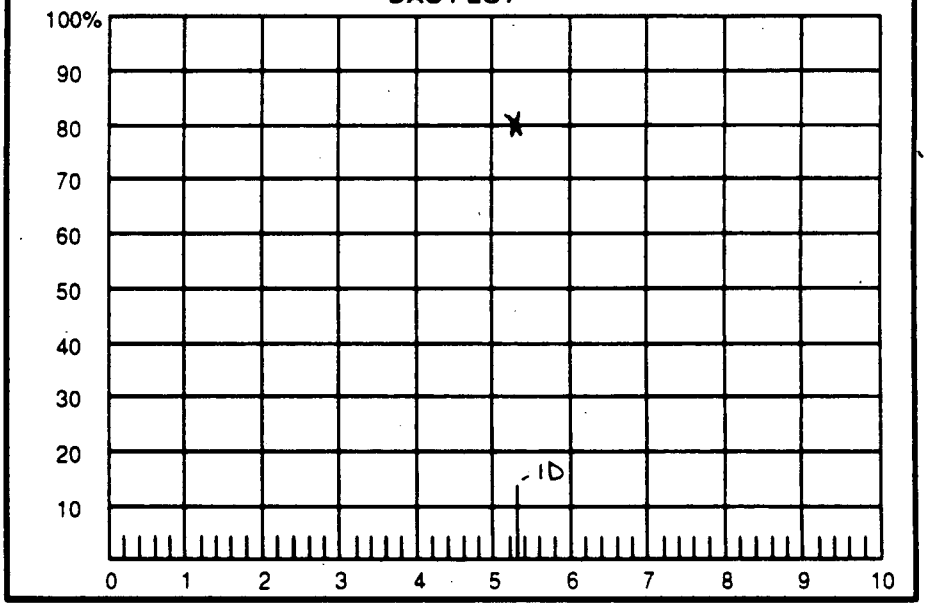
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	2012

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10-4-93
2 [signature] LEVEL II DATE 10-4-93

REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AWII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1225-013

PAGE 5 OF 7

EXAM ITEM

Weld No. 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 4" Pressurizer Safety Line

ISO/DWG. NO. CPL-118 REV. 0

THERMOMETER S/N 962

COMPONENT TEMP. 82 °F

SCAN 45 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: See attached sketch for profile

N/A

EXAMINERS:

1 [signature] LEVEL II DATE 10-4-93

2 [signature] LEVEL II DATE 10-4-93

REVIEWERS:

1 [signature] LEVEL III DATE 10-6-93

2 [signature] LEVEL N/A DATE 10/7/93

3 [signature] LEVEL III DATE 10/7/93

EXAM ITEM

Weld No. 5

ISO/DWG. NO.

CPL-118 REV.0

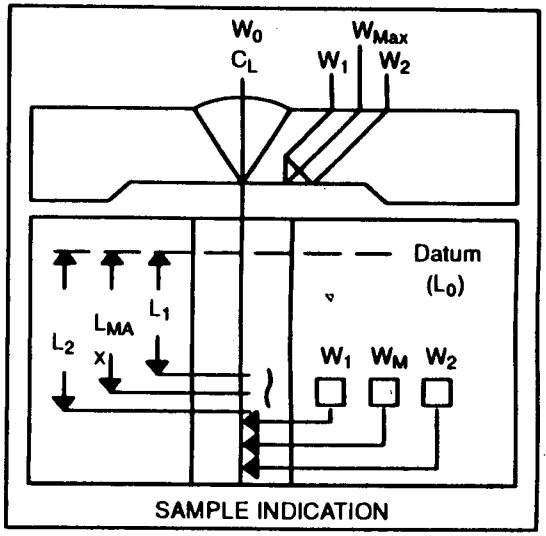
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-013

PAGE 6 OF 7

SEARCH UNIT ANGLE 60 ° W_0 LOCATION CL of Weld L_0 LOCATION Pipe Extradose



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	65%	.85	1.1	N/A	N/A	N/A	N/A	N/A	13.6	N/A	N/A	U.S.	See attached sketch for profile
						N							N
							A						A

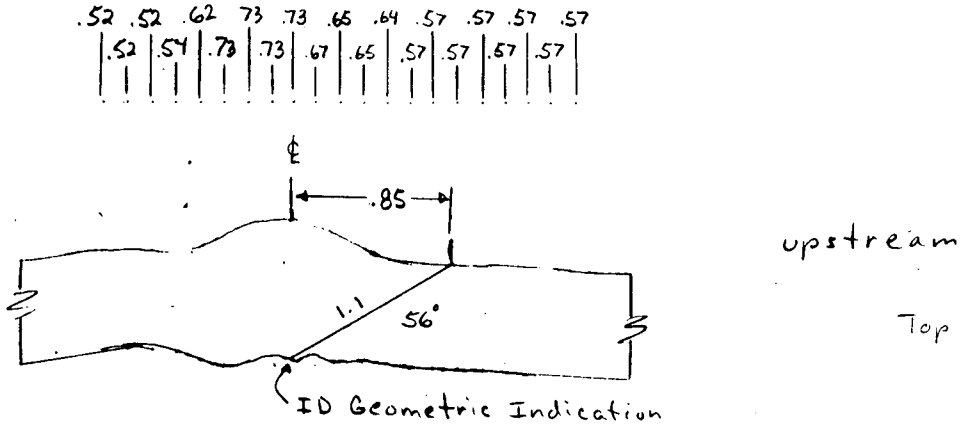
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	CD D. Judd	LEVEL II	DATE 10-4-93
	2	Benjamin Sanders	LEVEL II	DATE 10-4-93
REVIEWERS	1	Patt Ann	LEVEL III	DATE 10-6-93
	2	Richard D. Walker	LEVEL N/A	DATE 10/6/93
	3	R. Wallace	LEVEL ANII	DATE 10/7/93

NES 9/90

NUCLEAR ENERGY SERVICES, INC.

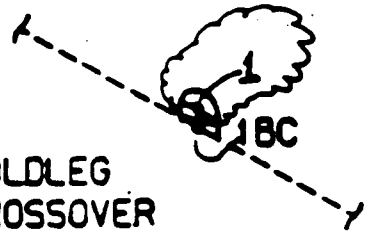
CPL-118 REV. 0
Weld No. 5



Examiner: Cl D. Judd Level: II Date: 10-4-93

Examiner: [signature] Level: II Date: 10-4-93

12223-013
PS. 7 of 7



COLDLEG
CROSSOVER

AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. NBB2-10618 SH 29					
CP & L P.O. No. CPL-91					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RPW	CPL	CLO	CLO	12/12/89

CPL-119 REV.0 NBB-9529

H.B. ROBINSON S.E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION LOOP A-3" RTD RETURN LINE	
LINE NO. 3-RC-76 | CPL-119 REV.	

I certify that the image contained on this frame was made in the normal and regular course of business on the date

DATA SHEET NO. 1217-015
THERMOMETER S/N JL91-03
TEMPERATURE 98 ° F
NOMINAL THICKNESS .438 INCHES
MATERIAL SS
CLASS 1

HBR2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED COLDLEG CROSSOVER ISO/DWG/SK. # CPL-119 REVISION 0
DATUM POINT REFERENCE N/A

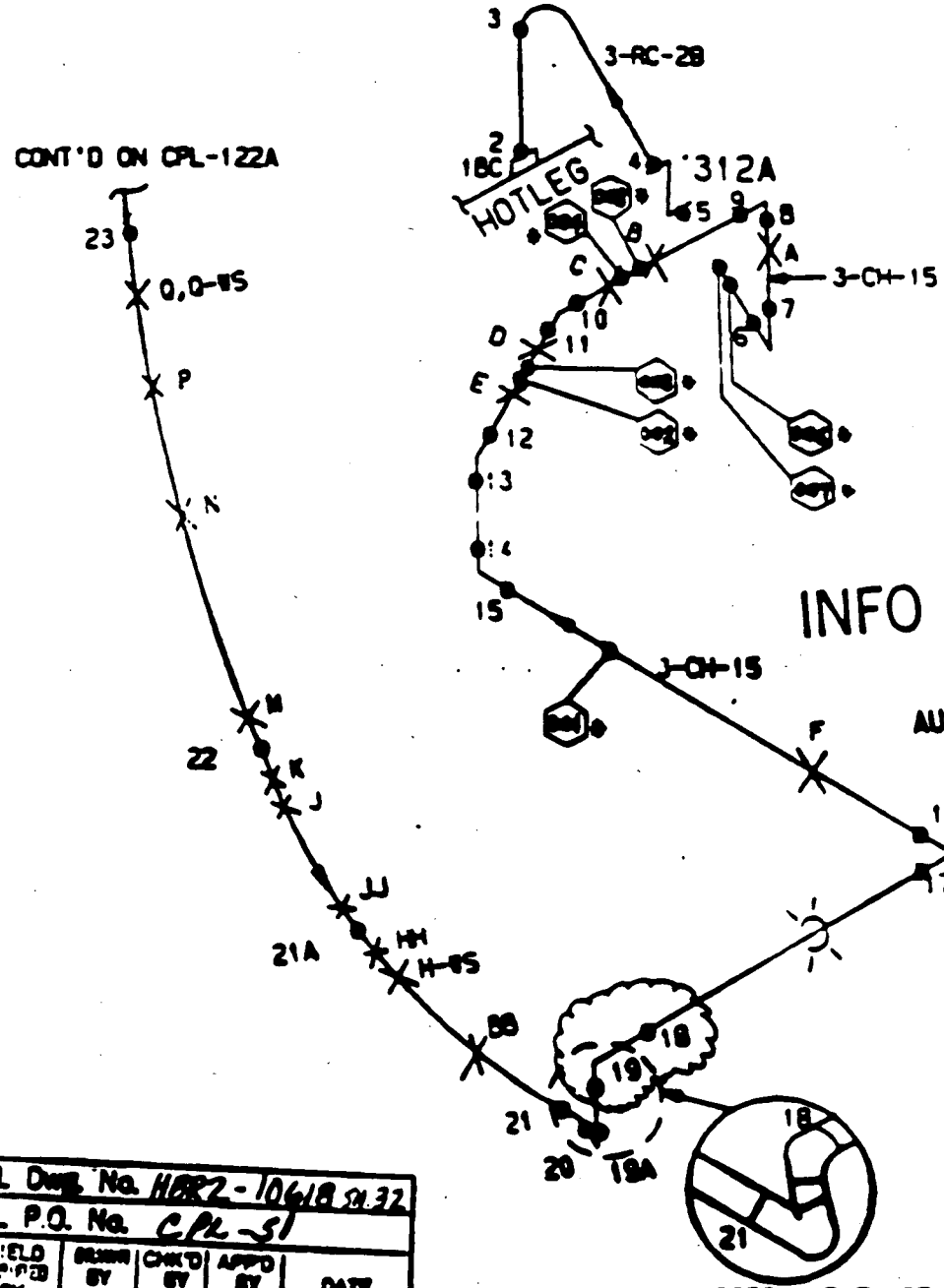
	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "1"	NO INDICATIONS NOTED	X	N/A
N/A	N/A	N/A	

EXAMINER Bernard A. Stone LEVEL II DATE 9/24/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Thomas LEVEL III DATE 9-27-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANIL R. Wadanes DATE 9/29/93

SEE NG DRAWING
0
RE-RUN SHEET
0-B:
H-B5

* MOD.713
DWG. FSK-713-348 REV.4



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH 32					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD REVISED BY	DESIGN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLD	CLD	12/12/89

CPL-122 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION LP.A 3" ALT. CHARGING LINE	
LINE NO. 3-CH-15	CPL-122 REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date

DATA SHEET NO. 1217-007
THERMOMETER S/N JL91-03
TEMPERATURE 88 ° F
NOMINAL THICKNESS .438 INCHES
MATERIAL 5/S
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOOP A 3" ALT. CHARGING LINE ISO/DWG/SK. # CPL-122 REVISION 0

DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #18	NO RECORDABLE INDICATIONS	X	N/A
WELD #19	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-22-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-22-93
REVIEWER Scott Larson LEVEL III DATE 9-22-93
REVIEWER Richard B. Weber DATE 9/22/93
REVIEWER ANII Ed Valladares DATE 9/23/93

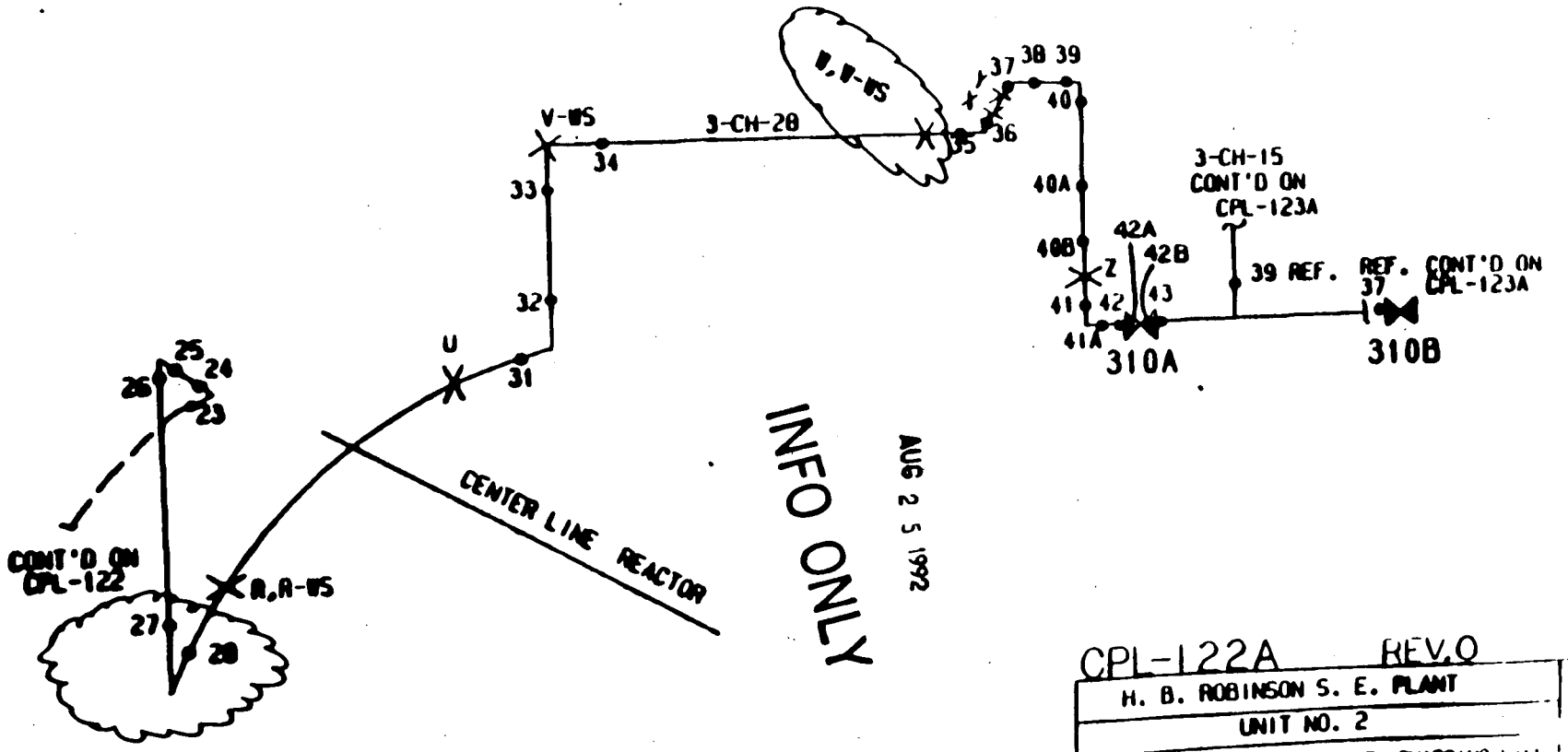
CP & L Dwg. No. HBR2-10618 SH 32

CP & L P.O. No. CPL-51

DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	REW	CPL	CLO	CLO	12/12/89

SPRING HANGERS
X,Y

WELDED SUPPORTS
W-WS
R-WS
V-WS



INFO ONLY

AUG 2 5 1992

CPL-122A REV.0

H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: LP.A 3" ALT. CHARGING LIN
LINE NO. 3-CH-28 | CPL-122A REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-117
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: CHEM & VOL. CONTROL	Component Name: SUPPORT/HANGER	Component ID: 122A-W
Drawing/Location: CPL-122A-W / CV-FIG 238.50		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sipp Level: II Date: 9-23-93

Examiner: QA Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

Reviewed: Scott Lam LTR 9-24-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B Weber Date: 9/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 9-29-93

DATA SHEET NO. 1217-037
THERMOMETER S/N MR92-04
TEMPERATURE 75 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED L.P.A 3" ALT. CHARGING LINE ISO/DWG/SK. # CPL-122A REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "27"	NO INDICATIONS NOTED	X	N/A
WELD "28"	" " "	X	
N/A	N/A	N/A	

EXAMINER Kenneth A. Lane LEVEL II DATE 10-1-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Larson LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER Ann A. Palladan DATE 10/5/93

DATA SHEET NO. 1217-036
THERMOMETER S/N JL91-03
TEMPERATURE 74 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S/S
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE _____ OF _____

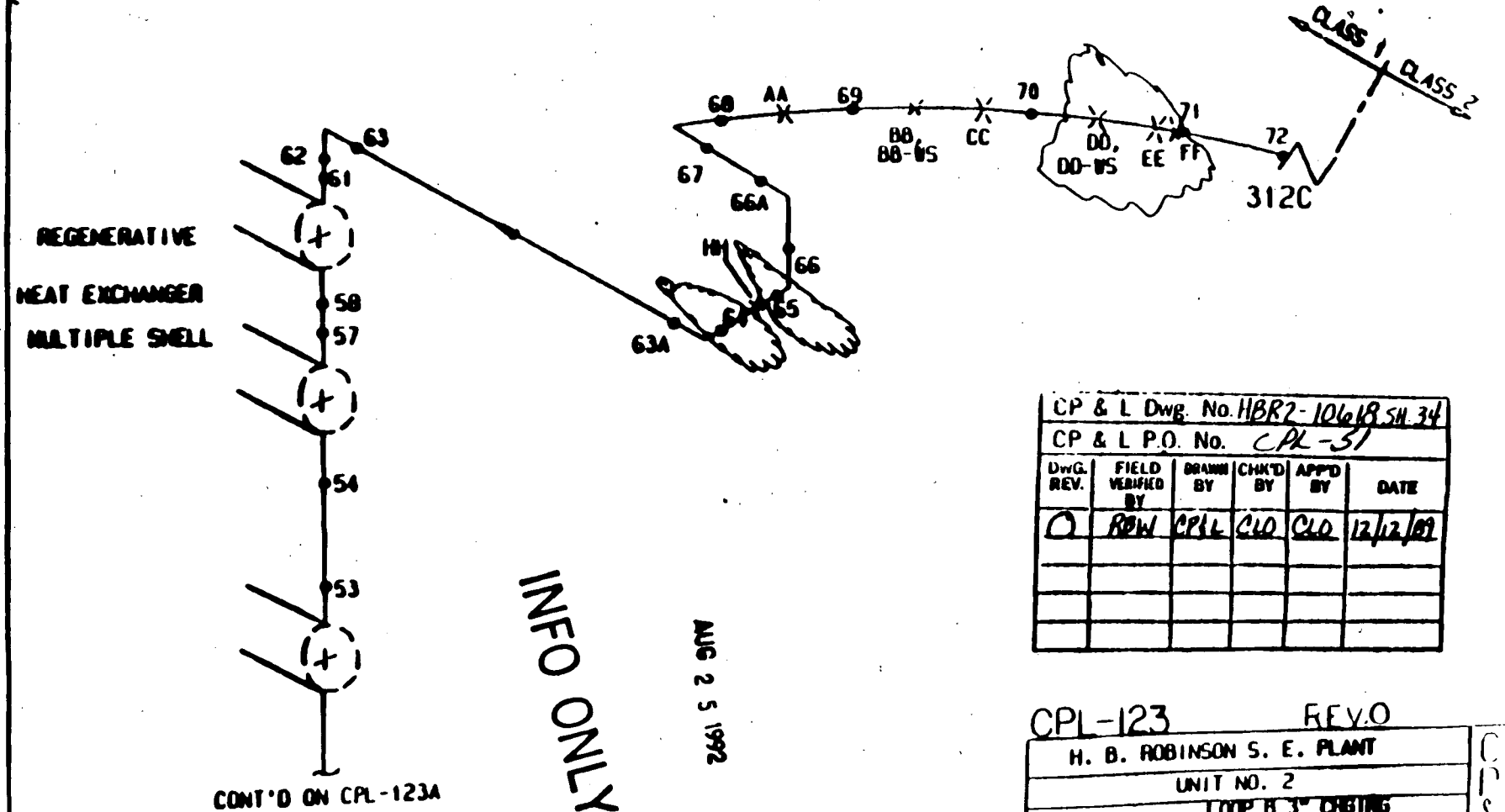
SYSTEM EXAMINED LP A 3" ALT. CHARGING LINE ISO/DWG/SK. # CPL-122A REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 42A	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Chris O. Judd / CQ N. Judd LEVEL II DATE 10-3-93
EXAMINER [signature] LEVEL I DATE 10-3-93
REVIEWER [signature] LEVEL III DATE 10-4-93
REVIEWER [signature] DATE 10/5/93
REVIEWER ANIL R. Valladares DATE 10/5/93

WELDED SUPPORTS
AA-WS
BB-WS
DD-WS



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH 34					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/89

CPL-123 REV.0

H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: LOOP B 3" CRDTMG LINE (1 OF 3)

CPS

I certify that the above drawing is a true and complete copy of the original as received from the Engineer or Designer.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project HBR Job No. 93-AJXK1 PSI☐ ISI☒

System: Charging	Component Name: Support	Component ID: 123 B
Drawing/Location: CPL123 Rev 0 / Containment 1st level		
☒ VT-3 Procedure: 614 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/27/93

Examiner: Level: Date:

Comments: Support documented on Report # 1230-007 as 123 EE is incorrect. After a walkdown with NED Engr. it was determined to be 123 BB. WR 93AJXK1 corrected the discrepancies in accordance with site memo TSE 93-CB

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-114
Page 1 of 1

Project HBR-2 Job No. PSI N/A ISI ☒

System: CHARGING	Component Name: SUPPORT	Component ID: BB
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Jones Level: II Date: 10-13-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ [illegible]

ISI Reviewer: Richard B Weber 10/14/93

[illegible] USE S. [illegible] ONLY

ANIL Palladares 10-14-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-007
Page 1 of 2

Project HBR Job No. PSI☐ ISI☒

System: CHGING	Component Name: HANGER	Component ID: EE
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev.
Direct ☒ Remote N/A	Video Recording No.:	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror N/A Other ____	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION NOTED
Mechanical interference	N/A	X	" " "
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	MISSING NUT SEE DWG
Loose/missing parts	X	N/A	" " " "
Abnormal wear	N/A	X	NO INDICATION NOTED
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

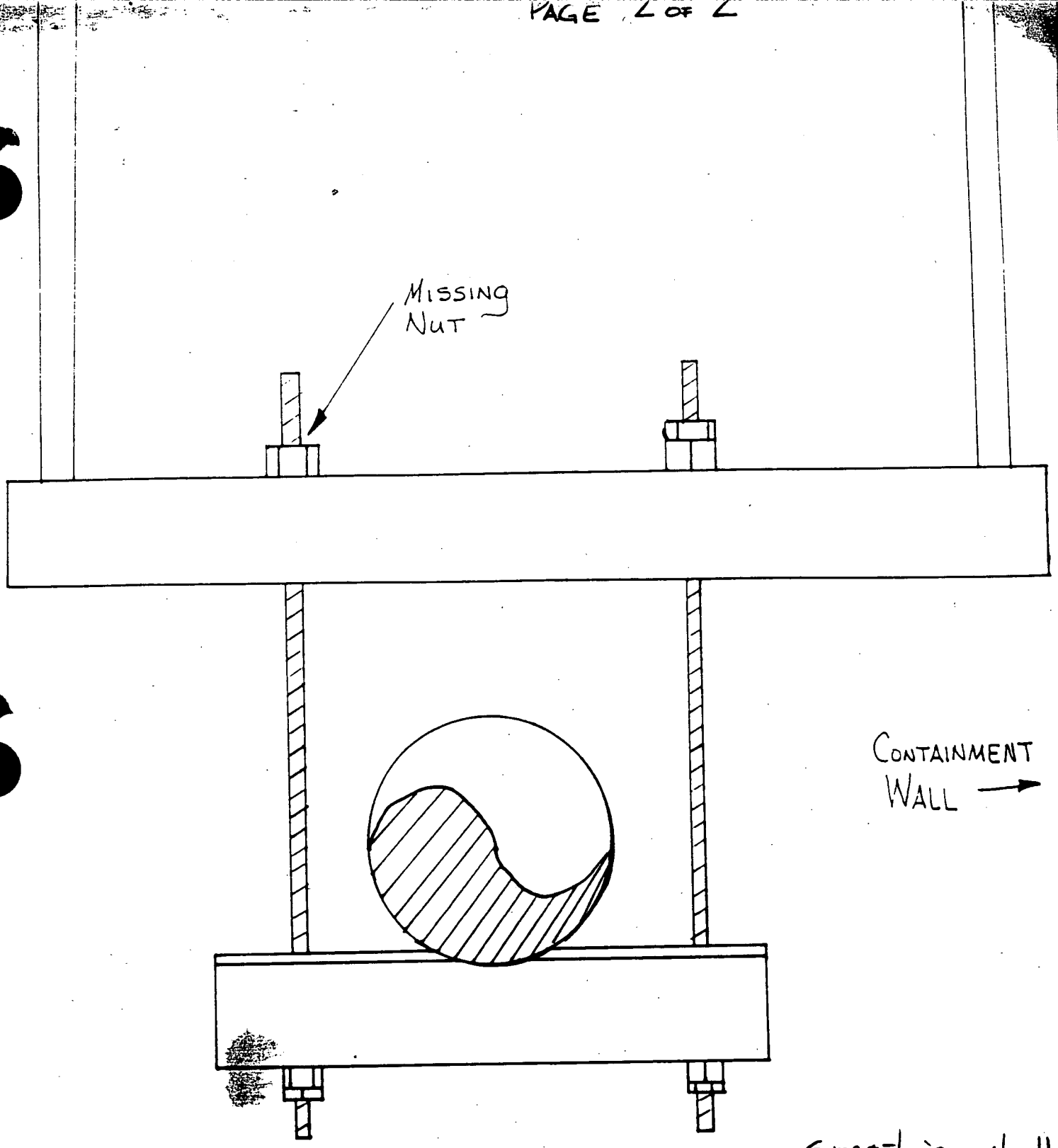
Examiner: Kenneth L. Stone Level: II Date: 9/22/93

Reviewer ~~Examiner~~: Scott Larson Level: III Date: 9-23-93

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 9/23/93



HBR2 DRAWING CPL-123

VIEW UPSTREAM

HANGER "EE"

KENNETH R NANCE

support is actually CPL-123-BB as field verified by C.A. Jones 9/24/93

9/22/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:

ATTN: Avery Jones

SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-123-[illegible] as documented on attached VT-3 inspection report.

SITE MEMO
TSE-93-[illegible] 43
SHEET [illegible] OF [illegible]
MOD M-[illegible]
PCN [illegible]
RET-R G93-[illegible]

DISTRIBUTION:
Dick Weber

SIGNED: [illegible signature]

RESPOND BY: 9/30/93

*RELEASING AUTHORITY: [illegible signature]

DATE: 9/23/93

RESPONSE:
Support is functional. Recommended corrective action is described on attached Support Corrective Action Evaluation Documentation Sheet. Please note that this support was identified as CPL-123-EF by inspection in field but is actually CPL-123-BF which was not scheduled for As-Built (?) inspection during RF 15

DISTRIBUTION:
Dick Weber

SIGNED: C. A. Jones

*RELEASING AUTHORITY: D. M. Dyksterhouse

DATE: 9/30/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-123-BB Visual Exam Report No. NA

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

Replace missing jamb or lock nut. The replacement nut shall be ASTM A-563 GR A (R or Non-R) or equal. Acceptable substitutes are A-194 GR 7 or 2H. Size will match threaded rod in field. Diameter is estimated as 5/8" & but could not be direct measured in field at time of field examination due to lack of ladder available. Nut shall be installed snug tight. Rod threads will probably require some cleaning prior to installing nuts. Nut may be half nut, hex, or heavy hex. Restoration is a WR item.

Basis:

Support is Non-Safety Related Dead weight (Trapeze Hanger w/ Rods.) Primary nut is intact therefore, carrying capability is unaffected. Nut shall be replaced to restore support to full design configuration. Lock nuts are snug tight per CPL-HBR2-C-911; Lock nuts do not need torque.

NED Engineer Date 9/29/93.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-014
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒ CH-13-14/4

System: CHGING	Component Name: HANGER	Component ID: DD
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote N/A	Video Recording No.:	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Lane Level: II Date: 9/24/93

Examiner: N/A Level: N/A Date: N/A

Comments: COMPONENT (DD) WAS VERY DIFFICULT TO IDENTIFY PER ISO. WITHOUT DRAWINGS WITH ELEVATIONS, PIPE MARKINGS, VALVE ID LABELS, HANGER/SUPPORT ID LABELS.

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/29/93

ANII RP Valladares 9-29-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-001
Page 1 of 1

Project HBR Job No.

PSI ☐ ISI ☒

System: CHGING	Component Name: HANGER	Component ID: DD
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A Rev.	
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror N/A Other N/A	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth L. Hare Level: II Date: 9/22/93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard L. Weber Date: 9/22/93

QA NDE ISI 11, Rev. 0, 07/93

ANII L. Holladeres 9/23/93

DATA SHEET NO. 1217-038
THERMOMETER S/N JL91-03
TEMPERATURE 82 ° F
NOMINAL THICKNESS .438 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Loop B 3" CHGING ISO/DWG/SK. # CPL-123 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 64	No Recordable Indications	x	N/A
Weld No. 65	No Recordable Indications	x	N/A
	N/A		

EXAMINER Chris O. Judd / Chris O. Judd LEVEL II DATE 10-3-93
EXAMINER Benjamin Snyder LEVEL I DATE 10-3-93
REVIEWER Scott Young LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER ANII R. Palladares DATE 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-015
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒ CH-13-14/5

System: CHGING	Component Name: SUPPORT	Component ID: EE
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0		☐ VT-4 Procedure: N/A Rev.
Direct ☒ Remote N/A	Video Recording No.:	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION ~~INDICATIONS~~ SEEN NOTED 9/21/93
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 9/25/93

Examiner: N/A Level: N/A Date: N/A

Comments: COMPONENT (EE) WAS VERY DIFFICULT TO IDENTIFY PER ISO. WITHOUT DRAWINGS WITH ELEVATIONS, PIPE MARKING, VALVE ID LABELS, HANGER/SUPPORT ID LABELS.

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/2/93

ANII RPHalladams

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-073
Page 1 of 1

Project HBR2 Job No. PSI ☐ ISI ☒

System: CHGING	Component Name: HANGER	Component ID: FF
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☑ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Constant Support N/A Mechanical Snubber N/A Variable Support	☒ Support/Hanger

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Richard A. Hann Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:

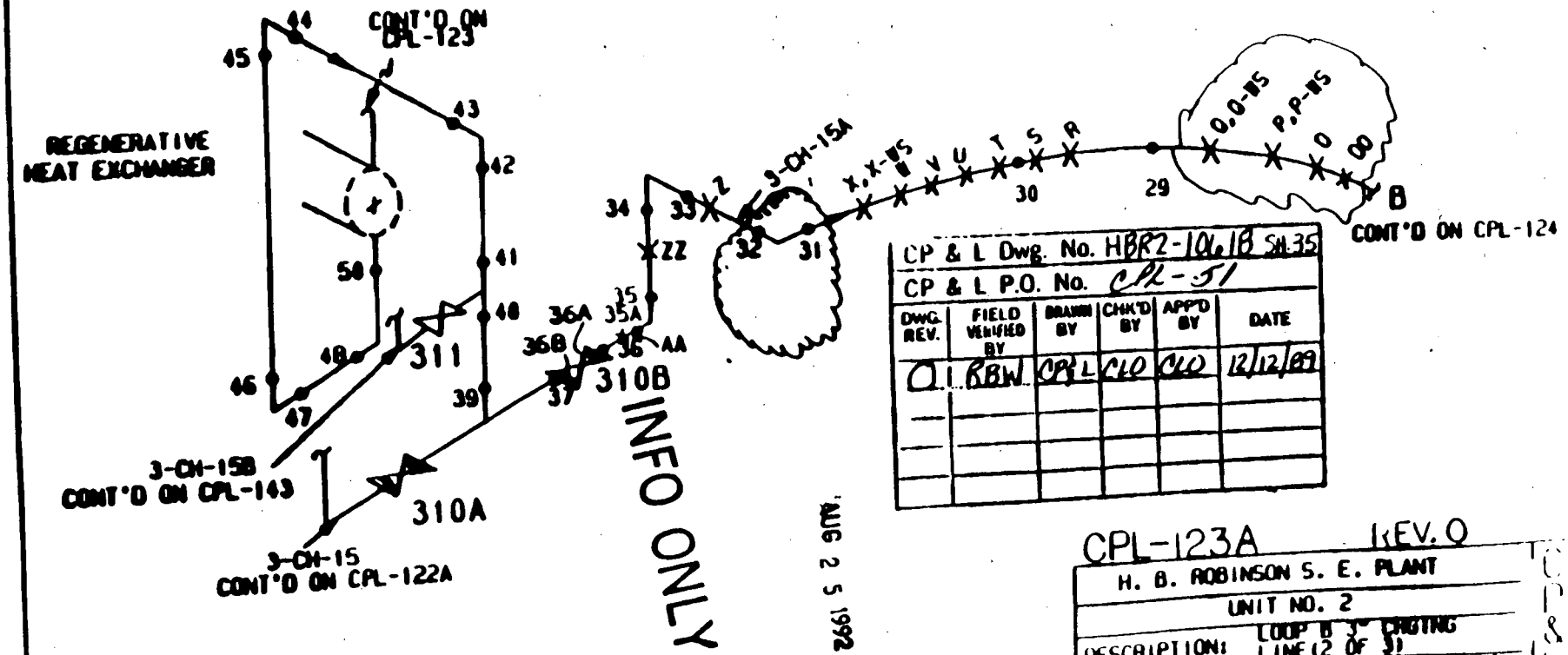
(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard A. Weber 10/11/93

CANDU ISI 11, Rev. 3, 07/93

ANII R Valladares 10/11/93

SPRING HANGERS
Z
WELDED SUPPORT
X-WS
P-WS
O-WS



INFO ONLY

AUG 25 1992

CP & L Dwg. No. HBR2-10618 SH 35					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0 1	RBW	CPL	CLO	CLO	12/12/89

CPL-123A REV. 0

H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: LOOP B 3" EXISTING LINE 12 OF 31
LINE NO. 3-CH-15A CPL-123A REV

I certify that this CAD generated as-built drawing was made from legible redlines of changes on this drawing.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-089
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: Chemical & Volume Control	Component Name: Support/Hanger	Component ID: 123A-C
Drawing/Location: CPL-123A R10 / Rx. Bldg. 228' Floor Elevation		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sim Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

Anil Ballabadra 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-100
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Support / Hanger	Component ID: 123A-00
Drawing/Location: CPL-123A R/0 / RX Bldg. 228' Elev.		
☒ VT-3 Procedure: Sp. 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Stop Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard O. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII RP Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-093
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: Chemical & Volume Control	Component Name: Support/Hanger	Component ID: 123A-P
Drawing/Location: CPL-123A R/C / Rx. Bldg. 228' Floor Elev.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-9-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard O. Weber 10/11/93

QA Verification
AN11 A Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-116
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: CH	Component Name: Snubber	Component ID: CPL-123A Q
Drawing/Location: CPL-123A Rev. 0		
☒ VT-3 Procedure: SP1230 Rev. 0	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☒ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	✓	
Mechanical interference	N/A	✓	
Cracks	N/A	✓	
Missing attachment/hardware	N/A	✓	
Loose/missing parts	N/A	✓	
Abnormal wear	N/A	✓	
Abnormal corrosion	N/A	✓	
Abnormal gouges	N/A	✓	
Arc Strikes on sliding support	N/A	✓	
Misalignment of the support	N/A	✓	
Variable/Constant Support	Actual: N/A		
Snubber	Pin to Pin Actual: 21"	Stroke: 5"	S/N 24

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/14/93

Examiner: Level: Date:

Comments:

(ISI Use Only)
☑ Pass
☐ [illegible]

ISI Reviewer: Richard B. Weber 10/16/93

QA [illegible] 10/19/93

DATA SHEET NO. 1217-039
THERMOMETER S/N MR92-04
TEMPERATURE 79 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

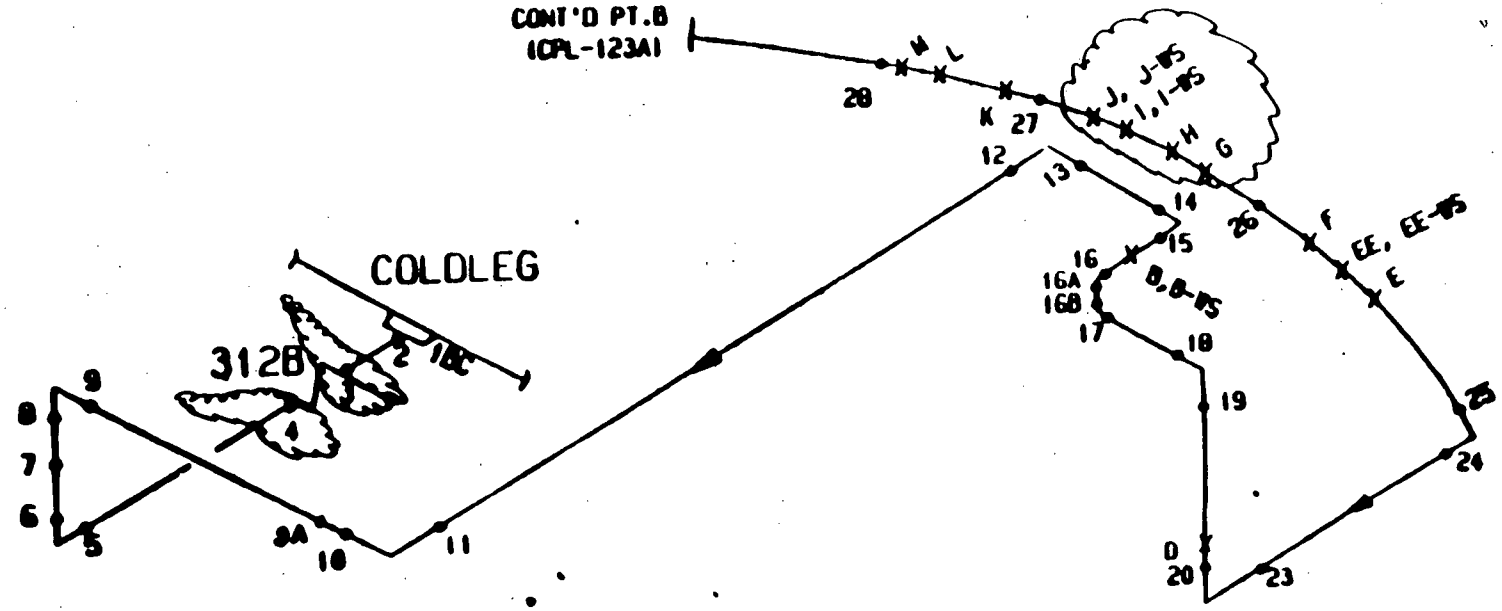
SYSTEM EXAMINED CHGING LINE ISO/DWG/SK. # CPL-123A REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "31"	NO RECORDABLE INDICATIONS	X	N/A
WELD "32"	" " "	X	
N/A	N/A	N/A	

EXAMINER Brent A. Hamm LEVEL II DATE 10/1/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Larsen LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER Anil A. Vallabhan DATE 10/5/93

SNUBBERS
J
WELDED SUPPORT
B-W5
I-W5
J-W5
EE-W5



CP & L Dwg. No. 11BR2-10W13.SH.36					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/82

INFO ONLY

AUG 25 1983

CPL-124 REV. 0

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP B 3" CHEMICAL LINE (3 OF 3)	
LINE NO 3-04-154 CPL-124 REV	

I certify that the image contained on this frame was made [illegible] of business on the date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-088
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Support / Hanger	Component ID: 124-G
Drawing/Location: CPL-124 R/O / Rx. Bldg. 228' Elev. (Floor)		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/11/93

ANII [signature] 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-087
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: CH	Component Name: Support/Hanger	Component ID: 124-H
Drawing/Location: CPL-124 R/O / Rx. Bldg. - Floor Elev 228'		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-045
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Chemical & Vol. Control	Component Name: Hydraulic Snubber	Component ID: 124 J
Drawing/Location: CPL-124 R/O / Rx. Bldg. - Floor Elev. 228' on Crane Wall		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☒ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: 3/4"	Stroke: N/A	S/N 23

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Singer Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard A. Weber Date: 10/7/93

ANII R Palladino 10/7/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-044
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CHEM. & VOL. CONTROL	Component Name: SUPPORT/HANGER	Component ID: 124-I
Drawing/Location: CPL-124 R/O / RX Bldg. 228' Elev.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

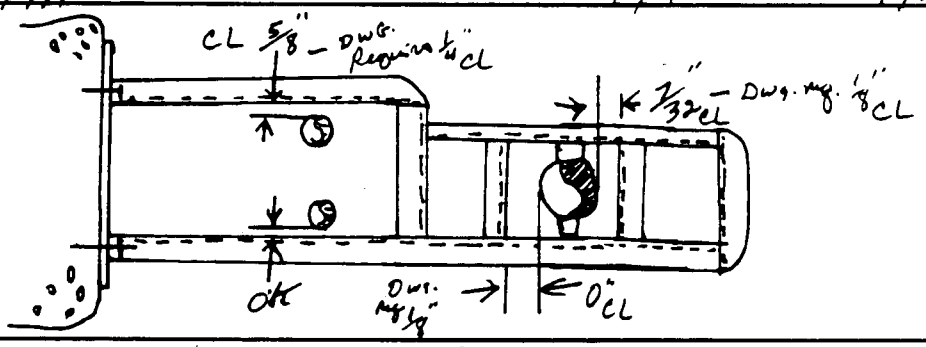
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CM

ISI Reviewer: Richard B Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANN Wilkerson 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-057
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: Chem. & Volume Control	Component Name: Support/Hanger	Component ID: 124-V
Drawing/Location: CPL-"R" 124 R/O		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☑ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

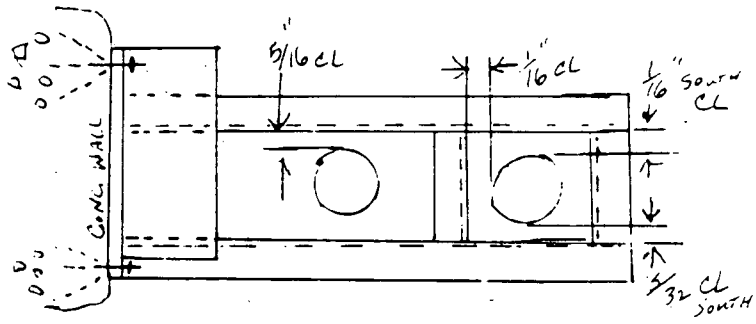
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Eugene Ferry Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo T5E-93-CU

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AWH [illegible] 10/28/93

DATA SHEET NO. 1217-055
THERMOMETER S/N MR92-03
TEMPERATURE 72 ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

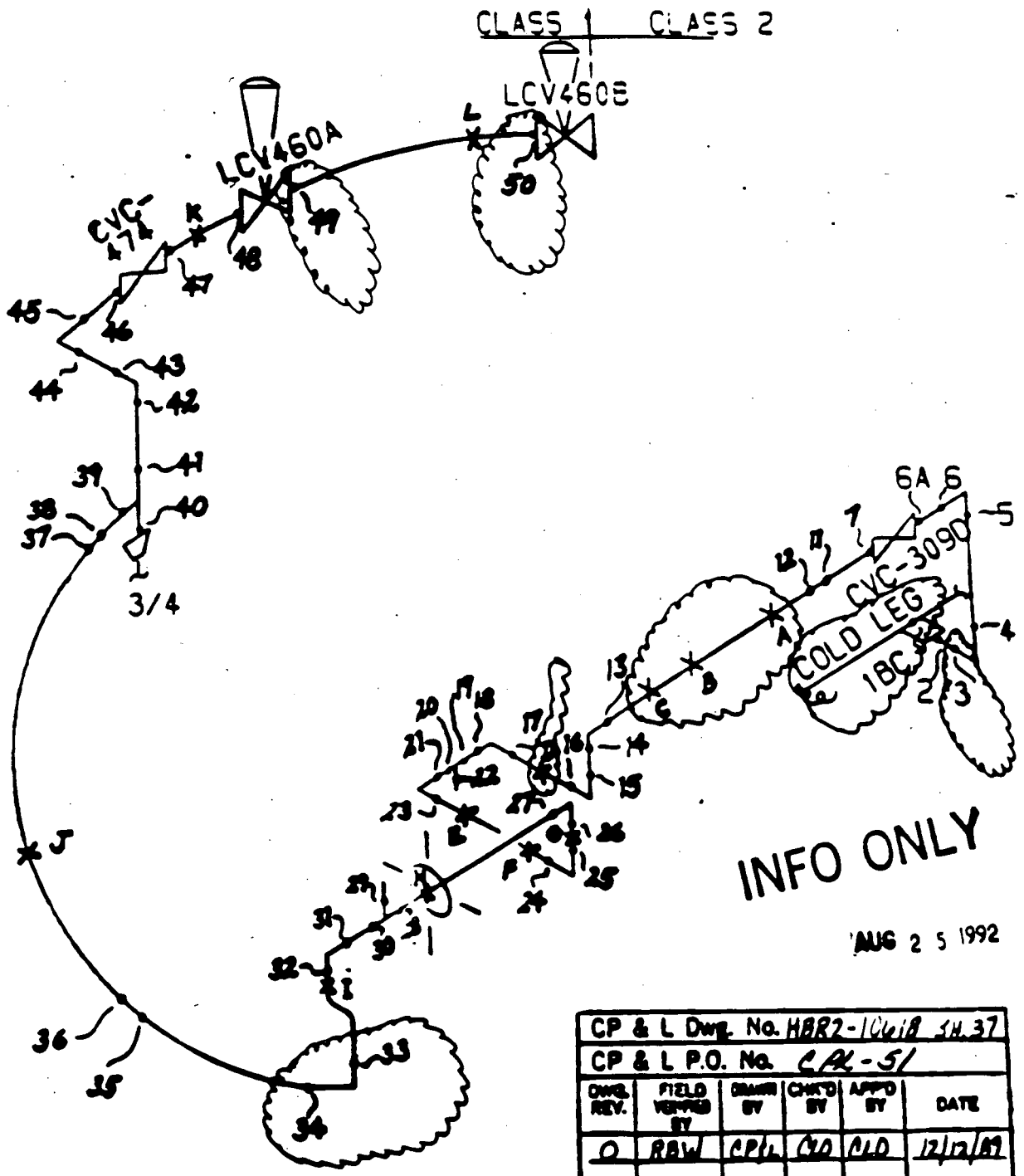
PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED CHGING ISO/DWG/SK. # CPL-124 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-S	93F03K	5 MINUTES
DEVELOPER	"	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "3"	NO INDICATIONS NOTED	X	N/A
" "4"	" " "	X	
N/A	N/A	N/A	

EXAMINER Kenneth A. Lane LEVEL II DATE 10-9-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lane LEVEL III DATE 10-10-93
REVIEWER Richard B. Weber DATE 10/11/93
REVIEWER ANII P Hiladares DATE 10/11/93



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH.37					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLD	CLD	12/17/89

NOTES:

WELDS 8,9,610 DELETED BY MOD-001

CPL-125 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP A 2" LETDOWN LINE	
LINE NO. 2-CH-17	CPL-125 REV.

I certify that the image contained on this frame was made

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1234-046
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: LETDOWN LINE	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-125		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

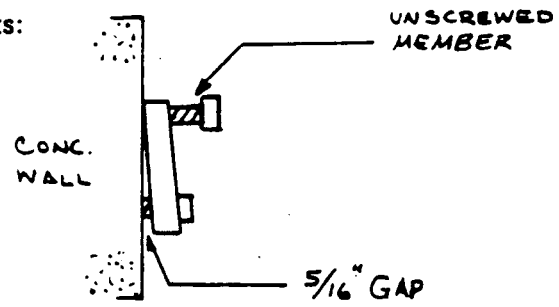
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support	X	N/A	SEE DRAWING BELOW
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") X Reject (When any answer above is "yes")

Examiner: Kenneth A. Mance Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber 10/27/93

NDE ISI 11, Rev. [illegible]

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page i of 1

Project Job No. PSI☐ ISI☒

System: CHEM. & VOL. CONTROL	Component Name: SUPPORT / HANGER	Component ID: 125B
Drawing/Location: CPL-125B / REACTOR BLDG. EL. 244' NEAR REACTOR COOLANT PUMP A		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sipp Level: II Date: 9-22-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

NO COMPONENT ID TAG

Reviewed: Scott Lamm 9-24-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/27/93

ANII A Balladares 9/29/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: Chemical & Vol Control	Component Name: Support/Hanger	Component ID: 125-C
Drawing/Location: CPL-125C		
☒ VT-3 Procedure: SP-1230 Rev. C	☐ VT-4 Procedure: N/A	Rev. O
Direct ☒ Remote ☐	Video Recording No.: N/A	☑ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-22-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

NO IDENTIFICATION TAG ON COMPONENT

Reviewed: [signature] LIII 9-24-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 9/27/93

AN II RP Valladares 9-28-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI ☐ ISI ☒

Project Job No.

System: CH	Component Name: Variable Support	Component ID: 125 D
Drawing/Location: CPL-125 R/O / Rx. Bldg. - 228'-Flor Rep "A" BAY		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

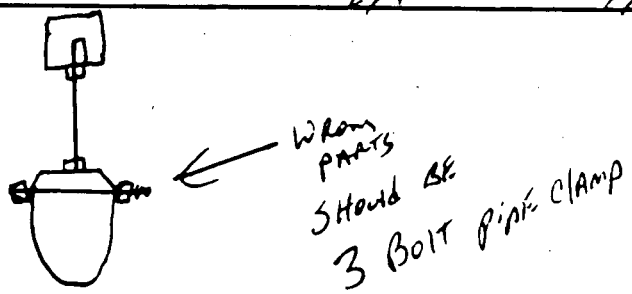
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 7/8"		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: C/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-EL

ISI Reviewer: Richard B. Weber 10/28/93

ANII A. Valladares 10/28/93

DATA SHEET NO. ~~SA 9-29-93~~ 1217-027
THERMOMETER S/N MR92-04
TEMPERATURE 86 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 2

SYSTEM EXAMINED Loop A 2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 3	No Recordable Indications	X	N/A
	Reexamination after additional Prep		
	N/A		

EXAMINER Chris D. Judd/CR D. Judd LEVEL II DATE 9-28-93
EXAMINER Benjamin Sandoval LEVEL I DATE 9-28-93
REVIEWER Scott Lewis LEVEL III DATE 9-29-93
REVIEWER Richard A. Wisby DATE 10/2/93
REVIEWER R Wallace DATE 10/12/93

DATA SHEET NO. 1217-027
THERMOMETER S/N MR92-04
TEMPERATURE 86 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 2 OF 2

SYSTEM EXAMINED Loop A-2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 3	Indications believed to be from inadequate surface preperation, to be reexamined after additional surface preperation	N/A	N/A
N A		N	A
		N A	

EXAMINER Chris D. Judd/CQ D. Judd LEVEL II DATE 9-27-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-27-93
REVIEWER [signature] LEVEL III DATE 10-1-93
REVIEWER Richard D. Weber DATE 10/2/93
REVIEWER A Maddanes DATE 10/12/93

DATA SHEET NO. 1217-008
THERMOMETER S/N JL91-03
TEMPERATURE 75 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. SW 9-1798 N/A 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOOP A 2" LETDOWN LINE ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 33	NO RECORDABLE INDICATIONS	X	N/A
WELD 34	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-17-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lawson LEVEL III DATE 9-17-93
REVIEWER Richard B. Weber DATE 9/21/93
REVIEWER R. Valladares DATE ANII 9-21-93

DATA SHEET NO. 1217-018
THERMOMETER S/N MR92-03
TEMPERATURE 78 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Loop A 2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 49	No Recordable Indications	X	N/A
Weld No. 50	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd/Ch D. Judd LEVEL II DATE 9-25-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-25-93
REVIEWER Scott Larson LEVEL III DATE 9-25-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANII R Balladares DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1217-026
THERMOMETER S/N MR92-04
TEMPERATURE 86 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF +3
SL 9-30-93

SYSTEM EXAMINED Loop A 2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE See Attached Drawing

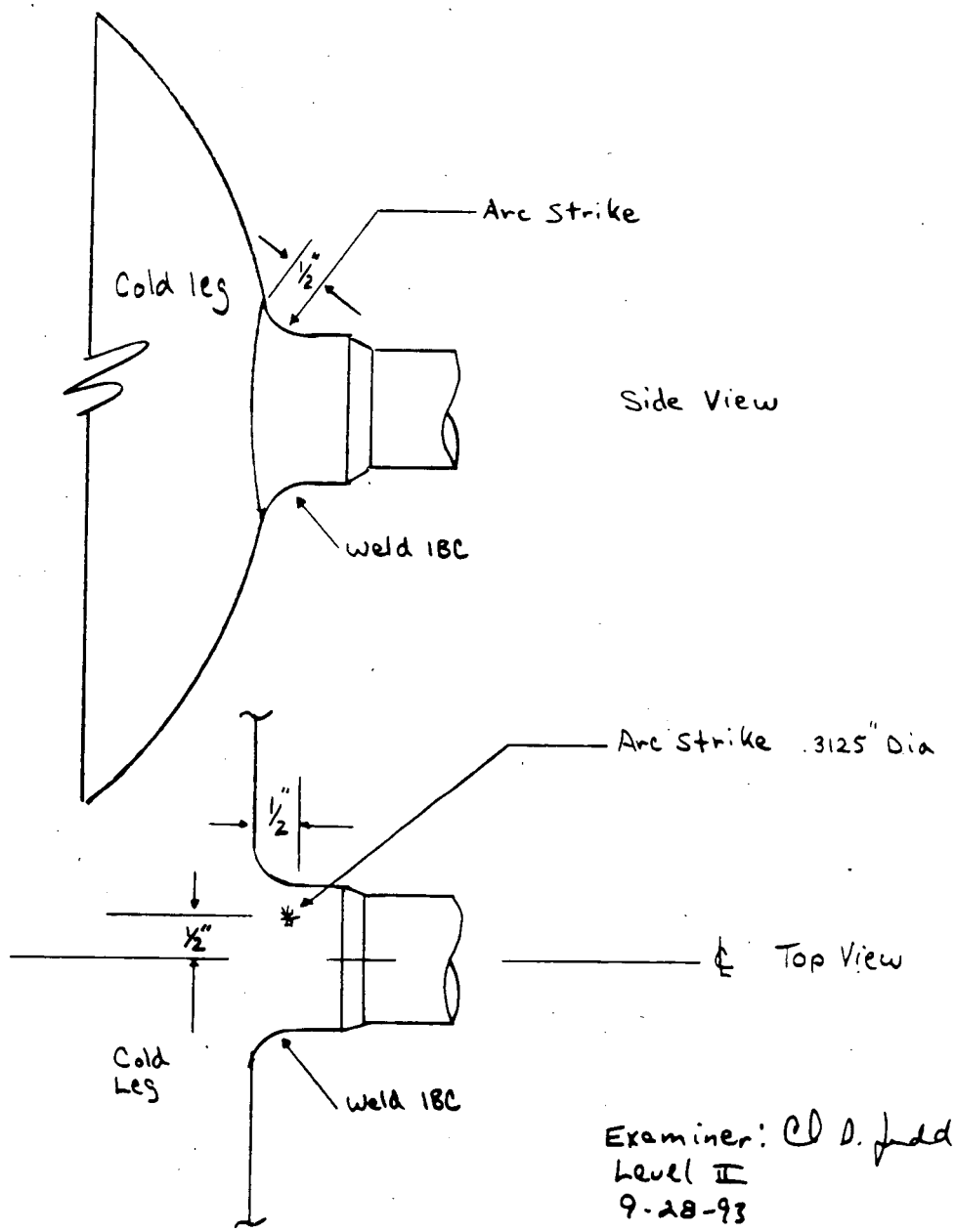
	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 1BC	.3125" Dia Arc Strike, See Attached Drawing	N/A	X
	N A		

EXAMINER Chris D. Judd/Cl D. Judd LEVEL II DATE 9-28-93
EXAMINER [signature] LEVEL I DATE 9-28-93
REVIEWER [signature] LEVEL III DATE 9-29-93
REVIEWER [signature] DATE 10/2/93
REVIEWER [signature] ANII DATE 10/2/93

CPL-125 REV.0

Weld No. 1BC



Examiner: CD D. Judd
Level II
9-28-93

DATA SHEET NO. 1217-026
THERMOMETER S/N MR92-03
TEMPERATURE 84 ° F
NOMINAL THICKNESS 2.6" INCHES
MATERIAL S/S
CLASS I

LIQUID PENETRANT EXAMINATION

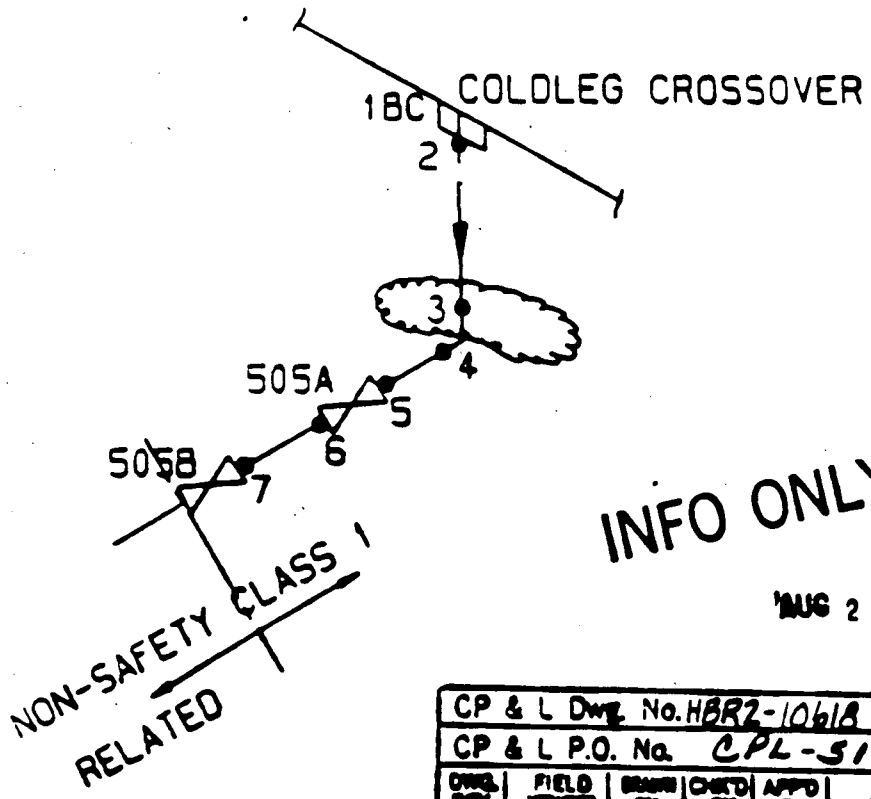
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 3 OF 3

SYSTEM EXAMINED LOOP A 2" LETDOWN LINE ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD # 1BC	INDICATIONS BELIEVED TO BE FROM INADEQUATE	N/A	N/A
N	SURFACE PREPERATION, TO BE REEXAMINED AFTER	N	
A	ADDITIONAL SURFACE PREPERATION		A
	N		
	A		

EXAMINER Chris D. Judd / C.D. Judd LEVEL II DATE 9-27-93
EXAMINER ~~Benjamin Sanders~~ LEVEL I DATE 9-27-93
REVIEWER ~~Scott Lamm~~ LEVEL III DATE 9-29-93
REVIEWER Richard A. Weber DATE 10/2/93
REVIEWER ANII RP Ballachhia DATE 10/12/93



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH. 38					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/89

CPL-126 REV. 0

H.B. ROBINSON S.E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION: LOOP A 2" DRAIN LINE	
LINE NO. 2-RC-40	CPL- 126 REV.

I certify that the image contained on this frame was made

DATA SHEET NO. 1217-009
THERMOMETER S/N JL91-03
TEMPERATURE 83 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

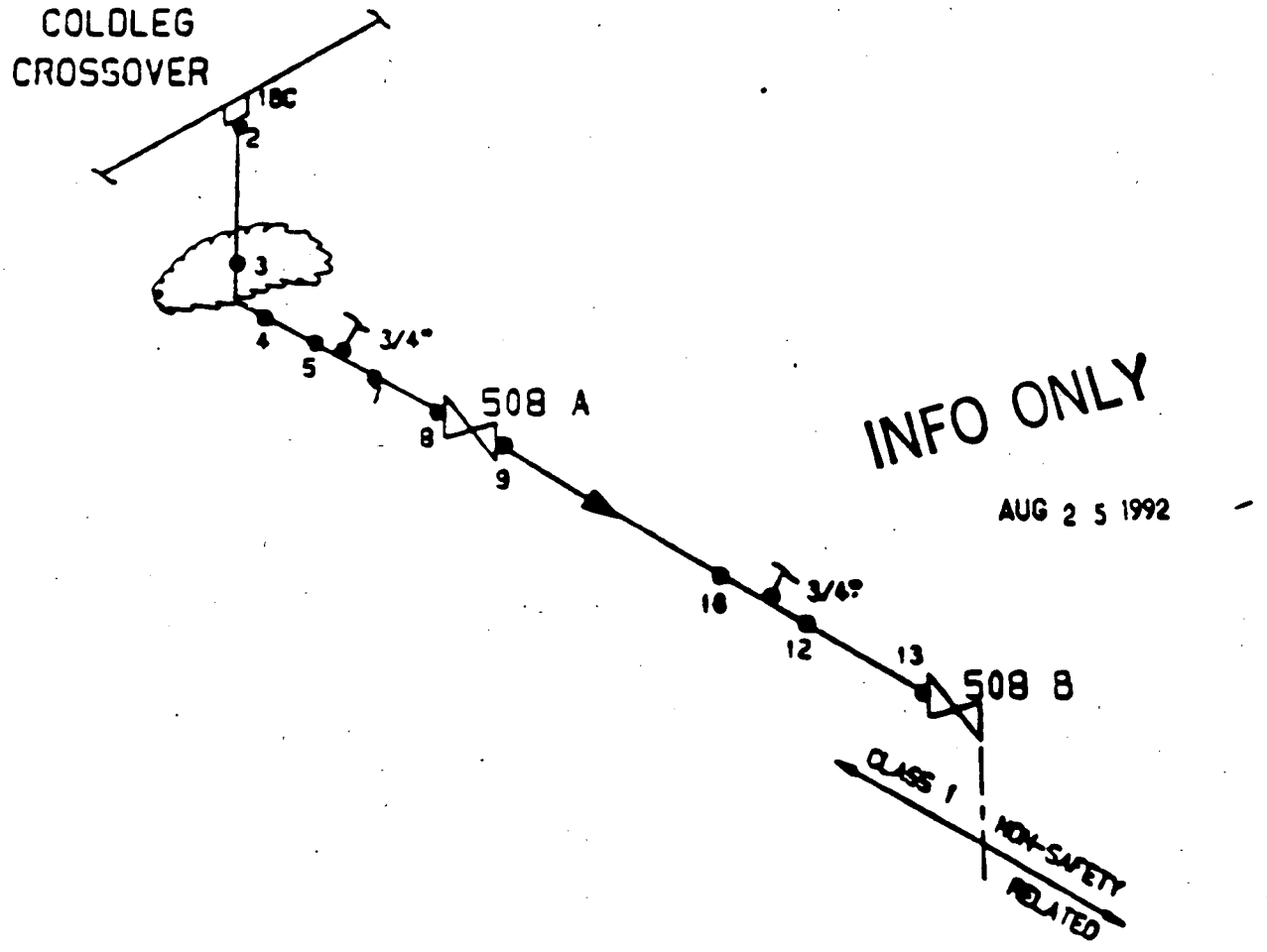
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOOP A 2" DRAINLINE ISO/DWG/SK. # CPL-126 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 3"	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-22-93
EXAMINER Benjamin Gardner LEVEL I DATE 9-22-93
REVIEWER Scott Farr LEVEL III DATE 9-22-93
REVIEWER Richard B. Weber DATE 9/22/93
REVIEWER ANII APWallabanes DATE 9/23/93



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No: HBR2-10618 SH. 39					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBH	CPL	CLO	CLO	12/12/91

CPL-127 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP B 2" DRAIN LINE	
LINE NO. 2-RC-39	CPL- 127 REV.

CP&L

I certify that the items contained on this frame was made

DATA SHEET NO. 1217-052
THERMOMETER S/N JL91-03
TEMPERATURE 74 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

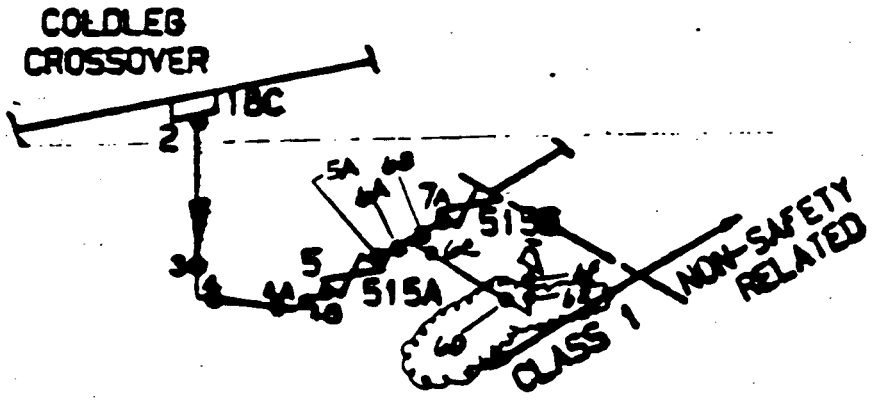
PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED LOOP B 2" DRAIN LINE ISO/DWG/SK. # CPL-127 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 3	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 10-5-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lewis LEVEL III DATE 10-6-93
REVIEWER Richard S. Weber DATE 10/7/93
REVIEWER R P Valladares AN11 DATE 10/7/93



INFO ONLY

AUG 2 5 1976

91-980

CPI-12B REV. 4

H.B. ROBINSON S.E. PLANT

UNIT NO. 2

DESCRIPTION: LOOP C-3" DRAIN LINE

LINE NO. 2-RC-38 CPI-12B REV. 4

DATA SHEET NO. 1217-021A
THERMOMETER S/N MR92-03
TEMPERATURE 82 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. 0
PAGE 1 OF 1

SYSTEM EXAMINED Loop C-2" Drain Line ISO/DWG/SK. # CPL-128 REVISION 1
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	20 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 6D	Reexamine After Rework	X	N/A
Weld No. 6E	Reexamine After Rework	X	N/A
	N/A		

EXAMINER C D. Todd LEVEL II DATE 10-6-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamb LEVEL III DATE 10-11-93
REVIEWER Richard O. Weber DATE 10/11/93
REVIEWER ANIL R. Belladanes DATE 10/11/93

DATA SHEET NO. 1217-021
THERMOMETER S/N MR92-03
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 2
SL 9-27-93

SYSTEM EXAMINED LOOP C-2 DRAIN LINE ISO/DWG/SK. # CPL-128 REVISION 1
DATUM POINT REFERENCE SEE ATTACHED DRAWING

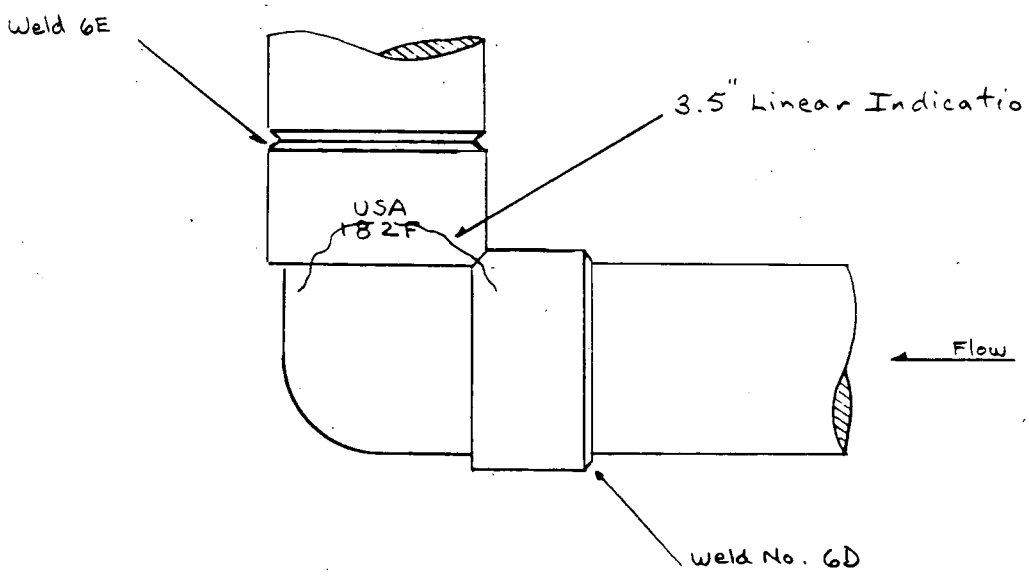
	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #6D	0.5" LINEAR INDICATION	N/A	X
WELD #6E	3.0" LINEAR INDICATION	N/A	X
	N		
	A		

EXAMINER Chris D. Todd / Chris D. Todd LEVEL II DATE 9-27-93
EXAMINER Benjamin Snyder LEVEL I DATE 9-27-93
REVIEWER Scott Egan LEVEL III DATE 9-27-93
REVIEWER Richard B. Weber DATE 9/27/93
REVIEWER ANII AP Valladares DATE 9/29/93

CPL-128 REV. 1

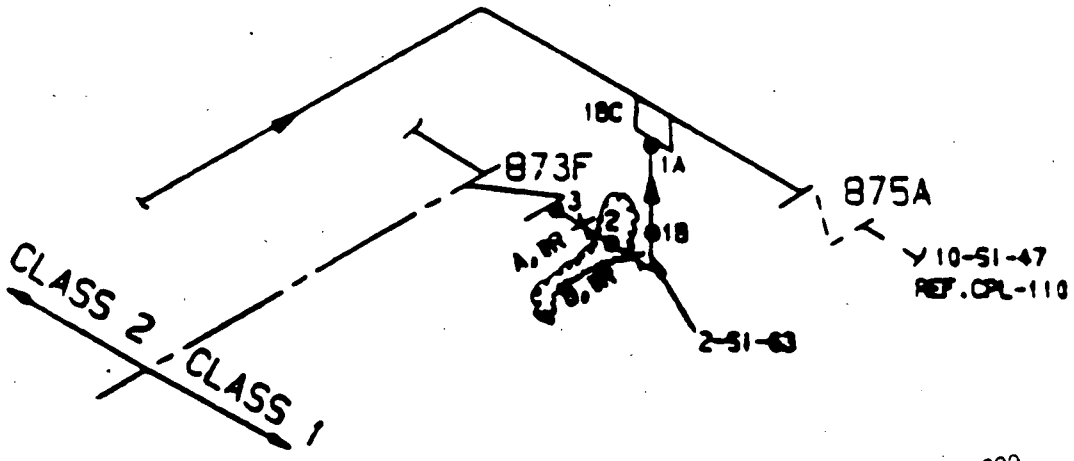
Weld No. 6D - 6E



Examiner: Chris Judd/Cl Judd Level II Date 9-27-93

Examiner: [illegible] Level I Date 9-27-93

Reviewed: Scott [illegible] Level III 9-27-93



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-10618 SH 41					
CP & L P.O. No. ER-51					
CHNG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	C.O.	C.O.	12/12/89

CPL-129 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP A-2" SIS B.I.T. LINE	
LINE NO. 2-SI-63	CPL- 129 REV.

DATA SHEET NO. 1217-040
THERMOMETER S/N mR92-03
TEMPERATURE 84 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS 1

LIQUID PENETRANT EXAMINATION

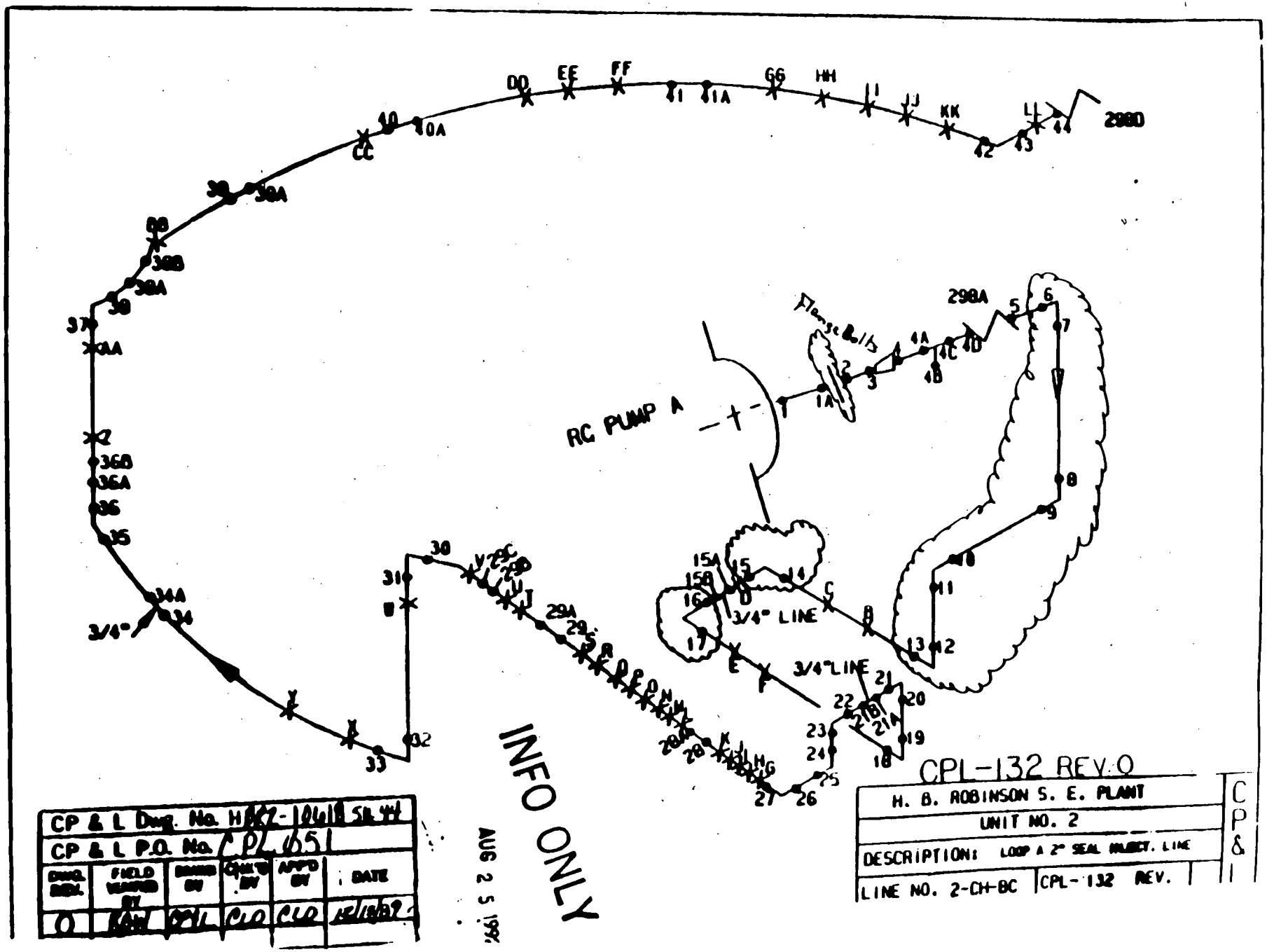
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE _____ OF _____

SYSTEM EXAMINED Loop A-2" SIS B.I.T. Line ISO/DWG/SK. # CPL-129 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 2	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd / C.D. Judd LEVEL II DATE 9-29-93
EXAMINER Benjamin Fowler LEVEL I DATE 9-29-93
REVIEWER Scott Larson LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER Anil A. Palladano DATE 10/5/93


RC PUMP A
3/4" LINE
3/4" LINE
3/4"
INFO ONLY
AUG 25 1982
CP & L Dwg. No. H-562-10618 SH. 44
CP & L P.O. No. CPL 651
DWG. REV.
FIELD VERIFIED BY
DRAWN BY
CHECKED BY
APPD BY
DATE
0
KAW
CPL
CLO
CLO
8/18/82
CPL-132 REV.0
H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: LOOP A 2" SEAL INJECT. LINE
LINE NO. 2-CH-BC
CPL-132 REV.
CP&L

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-013
Page 1 of 1

Project HBR Job No. Unit 1☐ 2☒

System: SEAL INJECTION	Component Name: FLANGE BOLTING	Component ID No.: ~~SAFETY INJECTION~~ Flange Bolting 1-4 (Ex 9-8-93)
Class: ONE	Location/Isometric: CPL-132 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT / 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
4 STUDS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
8 NUTS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	
		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Comments/Notes: NO INDICATIONS NOTED

Examiner: [signature] Level: II Date: 9-18-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: [signature] LIII 9-23-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: [signature] Date: 9/23/93

QA NDE ISI 6, Rev. 1, 07/93

ANII [signature] 9/23/93

DATA SHEET NO. 1217-010
THERMOMETER S/N MR 92-04 Cal. Due 11-3-93
TEMPERATURE 85 ° F
NOMINAL THICKNESS 0.344 INCHES
MATERIAL Stainless Steel
CLASS ONE

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION D F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Seal Injection ISO/DWG/SK. # CPL-132 REVISION C
DATUM POINT REFERENCE Top Head Center

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92AC1P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld #6	NO INDICATIONS NOTED	✓	
Weld #7	NO INDICATIONS NOTED	✓	
Weld #8	NO INDICATIONS NOTED	✓	
Weld #9	NO INDICATIONS NOTED	✓	
	N A		

EXAMINER	Eugene Simon	LEVEL	II	DATE	9-18-93
EXAMINER	N/A	LEVEL	N/A	DATE	N/A
REVIEWER	Scott Larson	LEVEL	III	DATE	9-21-93
REVIEWER	Richard D. Weber	DATE	9/21/93		
REVIEWER	R. P. Wallace Jones	DATE	AN II 9-21-93		

DATA SHEET NO. 1217-012
THERMOMETER S/N MR92-04
TEMPERATURE 85 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Seal Injection ISO/DWG/SK. # CPL-132 REVISION 0
DATUM POINT REFERENCE Top Dead Center

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 10	No Recordable Indications	X	N/A
Weld No. 11	No Recordable Indications	X	N/A
Weld No. 12	No Recordable Indications	X	N/A
Weld No. 14	No Recordable Indications	X	N/A
Weld No. 15	No Recordable Indications	X	N/A
Weld No. 16	No Recordable Indications	X	N/A
Weld No. 17	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris A Judd/CA A. Judd LEVEL II DATE 9-18-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamm LEVEL III DATE 9-18-93
REVIEWER Richard B Weber DATE 9/21/93
REVIEWER R Valladares ANII 9-21-93

DATA SHEET NO. 1217-011
THERMOMETER S/N MR92-04
TEMPERATURE 85 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

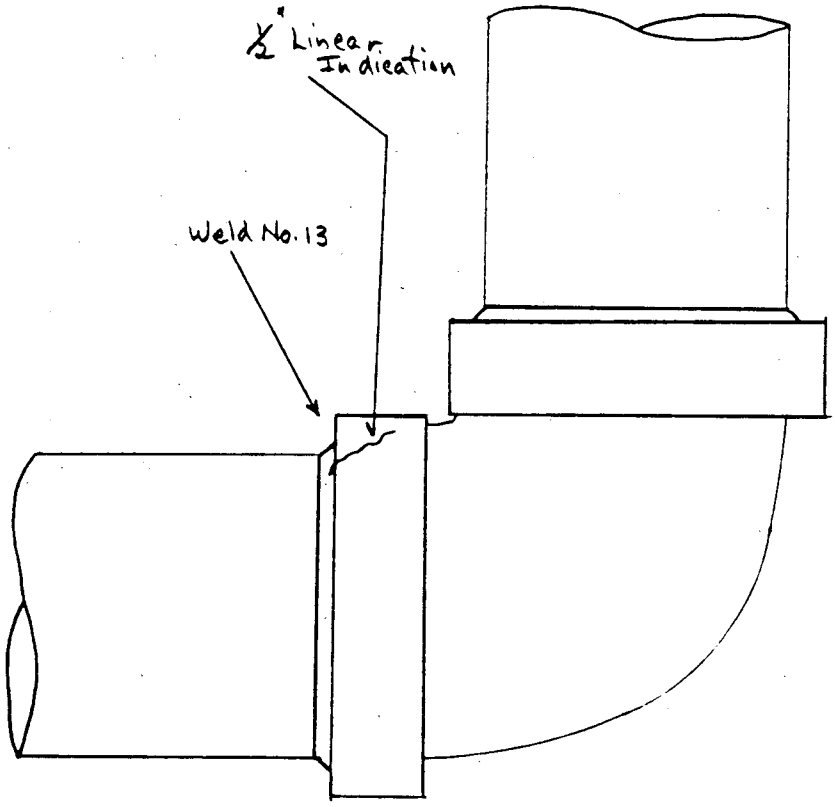
SYSTEM EXAMINED Seal Injection ISO/DWG/SK. # CPL-132 REVISION 0
DATUM POINT REFERENCE Top Dead Center

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

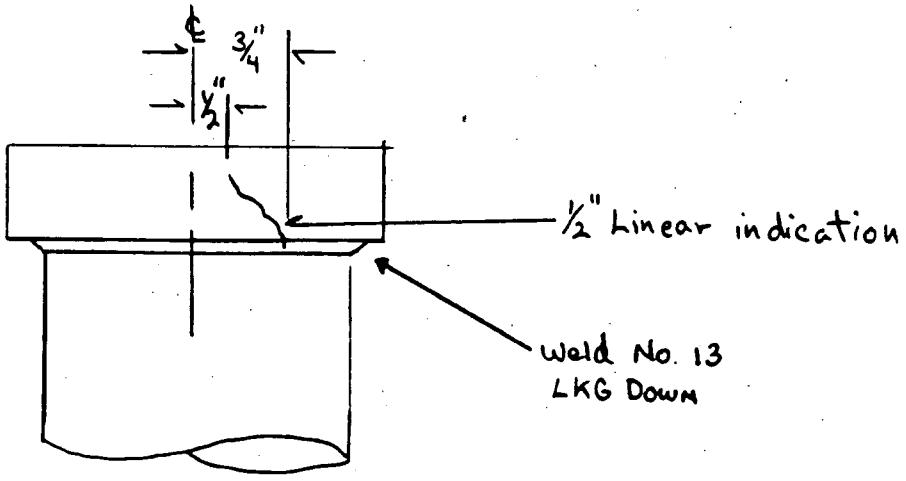
EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 13	See SKetch	N/A	X
	N		
	A		

EXAMINER Chris D. Judd / Chris D. Judd LEVEL II DATE 9-18-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lagan LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 9/21/93
REVIEWER A Balladares DATE ANII 9/21/93

Weld No. 13
Seal Injection
Pg. 2 of 2



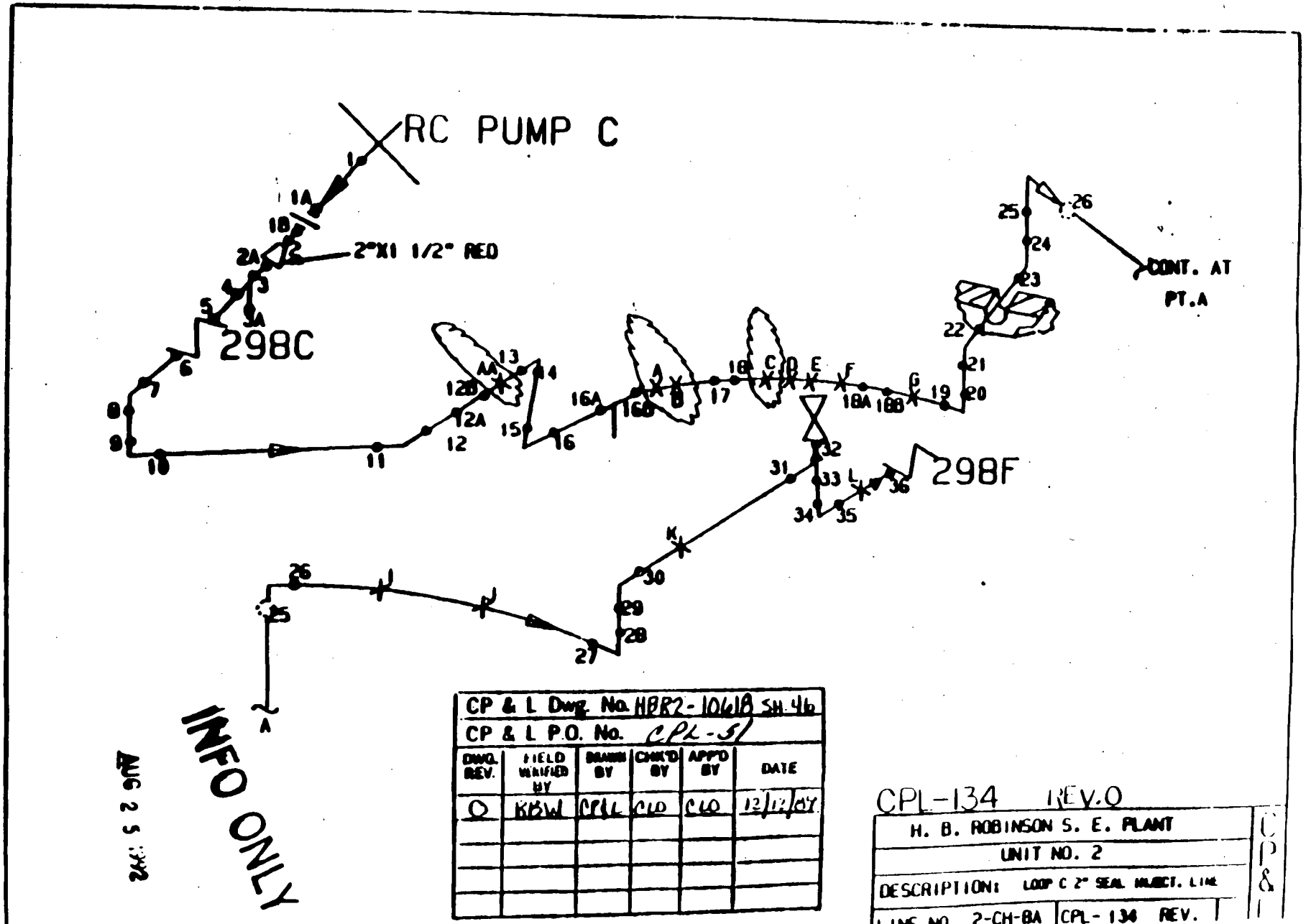
Side View.



Top View

reviewed:
Scott Larson LTII
9-19-93

Chris D. Judd/CDJ
Level II PT, 9-18-93



CP & L Dwg. No. HBR2-10618 SH. 46					
CP & L P.O. No. CPL-5					
DWG. REV.	FIELD MARKED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	KBW	CPL	CLD	CLD	12/12/01

CPL-134 REV.0

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP C 2" SEAL INJECT. LINE	
LINE NO. 2-CH-8A	CPL-134 REV.

CP&L

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-077
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-134		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☐ N/A
Equipment Used: N/A Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Constant Support N/A Mechanical Snubber N/A Variable Support ☒ Support/Hanger	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Slane Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/11/93

QA NDE ISI 11, Rev. 0, 07/..

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-076
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: AA
Drawing/Location: CPL-134		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒N/A
Equipment Used: N/A Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth L. Hare Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/11/93

QA NDE ISI 11, Rev. 3, 07/93

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-078
Page 1 of 1

Project HBR2 Job No. PSI ☐ ISI ☒

System: S1	Component Name: SUPPORT	Component ID: B
Drawing/Location: CPL-134		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-075
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: S1	Component Name: SUPPORT	Component ID: C
Drawing/Location: CPL-134		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

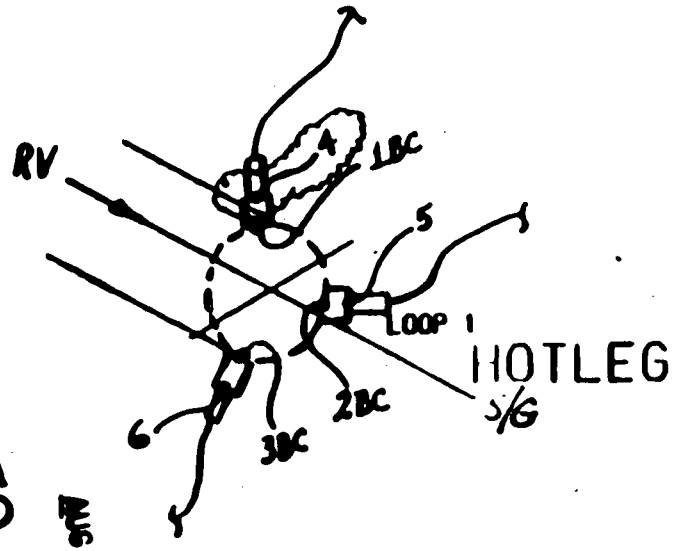
Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII RP Valladares 10/11/93



INFO ONLY

AUG 2 5 1994

CP & L Dwg. No. HBR2-10618 SH 47					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLD	CLD	12/12/89

CPL-135 REV.0

Applicable Loop A Only MOD-857

H. B. ROBINSON S. E. PLANT

UNIT NO. 2

DESCRIPTION: LOOP A ZERO POWER RTD

CPL - 135 REV

DATA SHEET NO. 1217-016
THERMOMETER S/N JL91-03
TEMPERATURE 94 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 1

HBR2
LIQUID PENETRANT EXAMINATION

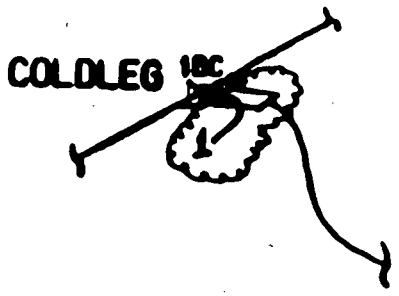
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED SG HOTLEG LOOP "A" ISO/DWG/SK. # CPL-135 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "4"	NO INDICATIONS NOTED	X	N/A
N/A	N/A	N/A	

EXAMINER Donald B. Hare LEVEL II DATE 9/25/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Harper LEVEL III DATE 9-27-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANII R Palladanes DATE 9/29/93



INFO ONLY

AUG 2 5 1992

AUG 2 5 1992

CP & L Dwg. No. HBR2-10618 SH 52					
CP & L P.O. No. CAK-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPSL	CLO	CLO	12/12/89

CPL-140 REV.0 MOD-859

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION: LP C 2"X1 1/2" COLEGRTD	
LINE NO. 2-RC-81	CPL-140 REV.

CP&L

DATA SHEET NO. 1217-056
THERMOMETER S/N 962
TEMPERATURE 85 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S.S.
CLASS 1

LIQUID PENETRANT EXAMINATION

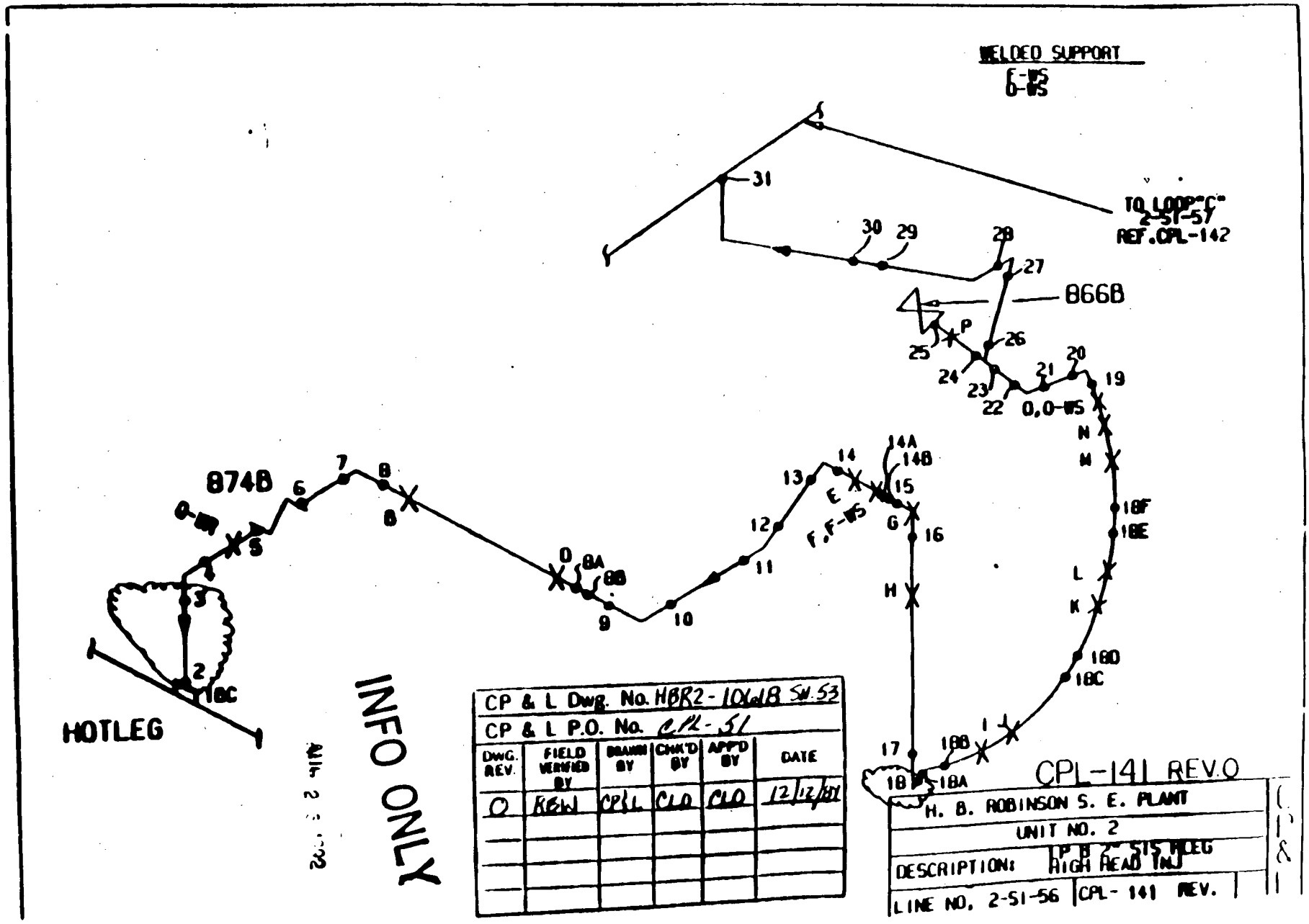
PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED R.T.D. ISO/DWG/SK. # CPL-140 REVISION 0
DATUM POINT REFERENCE T.D.C.

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
CPL-140 WELD # 1	2" X 1½" COLD LEG R.T.D/ NO INDICATIONS	✓	
	N/A		

EXAMINER David M Martin LEVEL II DATE 10/10/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lam LEVEL III DATE 10-11-93
REVIEWER Richard O. Weber DATE 10/11/93
REVIEWER ANII R Palladares DATE 10/11/93



I certify that the lines contained on this print are

DATA SHEET NO. 1217-013
THERMOMETER S/N JL91-03
TEMPERATURE 90 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LP B 2" SIS HLEG HIGH HEAD ENT ISO/DWG/SK. # CPL-141 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 2	NO RECORDABLE INDICATIONS	X	N/A
WELD 3	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wallum LEVEL II DATE 9-21-93
EXAMINER Benjamin Sander LEVEL I DATE 9-21-93
REVIEWER Scott [illegible] LEVEL III DATE 9-22-93
REVIEWER [illegible] DATE 9/22/93
REVIEWER ANIL R Valladares DATE 9/23/93

DATA SHEET NO. _____
THERMOMETER S/N MR92-04
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

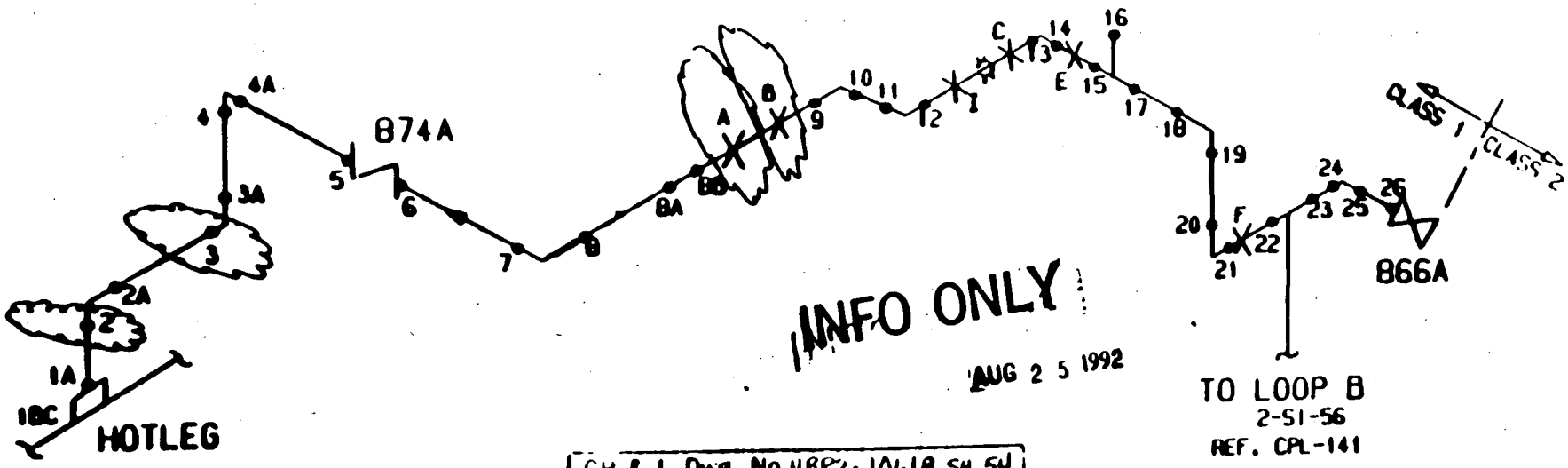
SYSTEM EXAMINED S.I. ISO/DWG/SK. # CPL-141 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 18	No Recordable Indications	X	N/A
	N A		

EXAMINER Chris D. Judd / Chris D. Judd LEVEL II DATE 9-22-93
EXAMINER ~~Benjamin Sigler~~ LEVEL I DATE 9-22-93
REVIEWER ~~Scott Lan~~ LEVEL III DATE 9-24-93
REVIEWER Richard B. Weber DATE 9/27/93
REVIEWER ANII R.P. Valladares DATE 9/29/93

SPRING HANGERS
F, I



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. 1BR2-1061B SH 54					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/89

CPL-142 REV. 0

H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: LOOP F 2" RLEG HIGH HEAD IND.
LINE NO. 2-SI-57 CPL-142 REV.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-107
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 142-A
Drawing/Location: CPL-142R/0 / Rx. Bldg. S/G "C" Cubicle - 28' El.		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

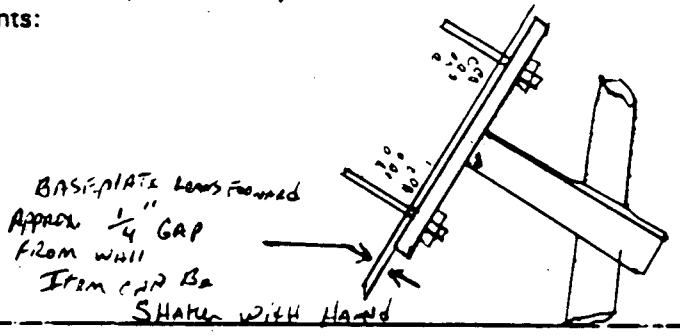
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-11-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: [signature] 10/27/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-047
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: S. I.	Component Name: SUPPORT	Component ID: B
Drawing/Location: CPL-142		
☒ VT-3 Procedure: SP-1230 Rev. 0		~~N/A~~ VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote ~~N/A~~	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ~~N/A~~ Flashlight ~~N/A~~ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: ~~N/A~~ Hydraulic Snubber ~~N/A~~ Constant Support ~~N/A~~ Mechanical Snubber ~~N/A~~ Variable Support	☒ Support/Hanger

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ~~N/A~~ Reject (When any answer above is "yes")

Examiner: Kenneth L. Hance Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/7/93

CR-NDE-ISI-1 Rev. 0 - 7/92
AN 11 R Valladares 10/7/93

DATA SHEET NO. 1217-029
THERMOMETER S/N MR92-04
TEMPERATURE 80 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

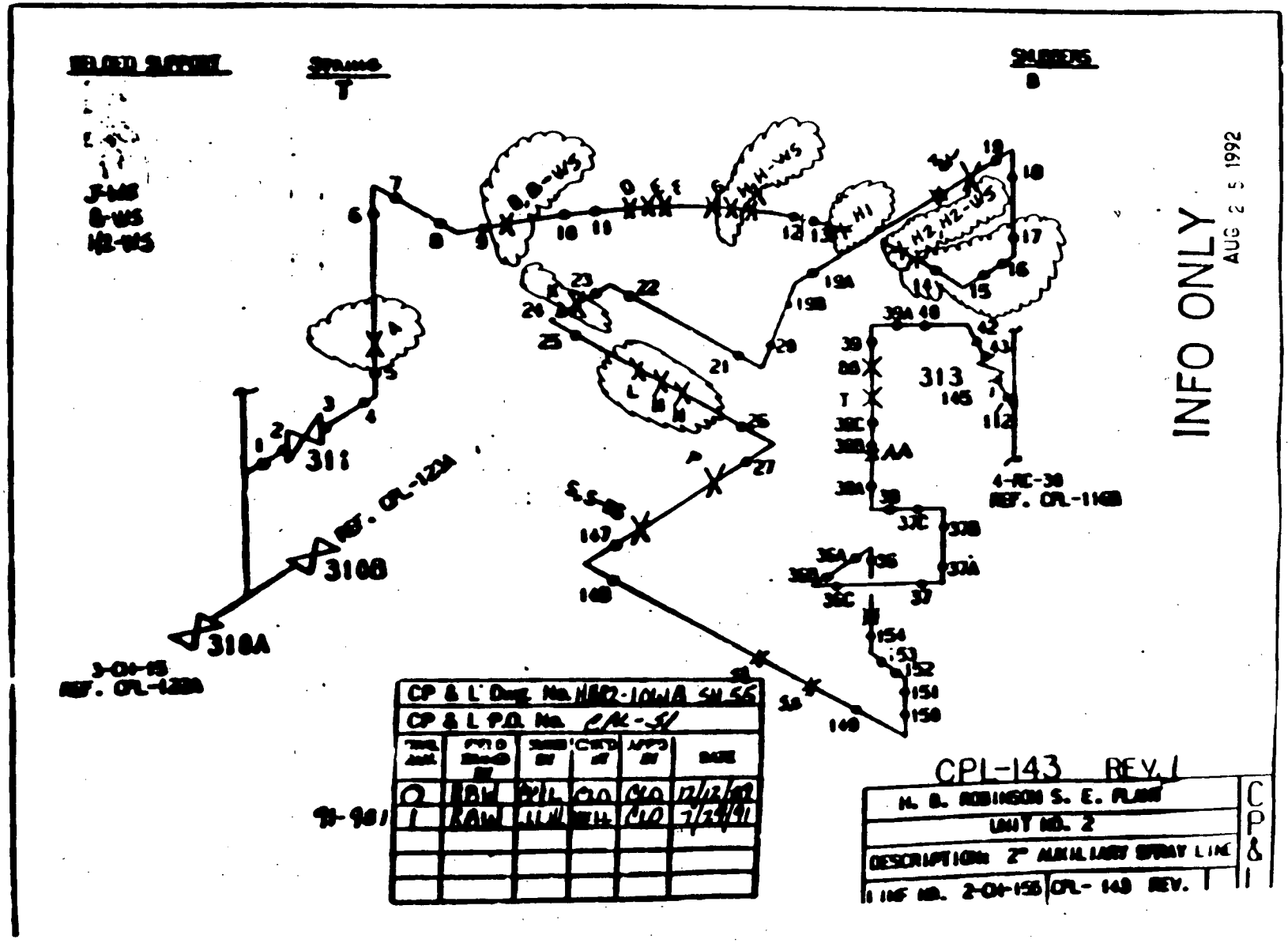
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED SG LOOP "C" ISO/DWG/SK. # CPL-142 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "2"	NO RECORDABLE INDICATIONS	X	N/A
WELD "3"	" " "	X	
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 9/28/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 9-29-93
REVIEWER [signature] DATE 9/29/93
REVIEWER [signature] DATE 9/29/93


INFO ONLY
AUG 2 5 1992
313
145
311
310B
310A
4-RC-36
REF. CPL-116B
3-CH-15
REF. CPL-122A
CP & L Dwg. No. HNP-10118 SH 56
CP & L P.O. No. CAK-56
CPL-143 REV. 1
H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: 2" AUXILIARY SPRAY LINE
LINE NO. 2-CH-155 CPL-143 REV. 1
CP & L

DATA SHEET NO. 1217-019
THERMOMETER S/N MR92-04
TEMPERATURE 84 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED AUX. SPRAY LINE ISO/DWG/SK. # CPL-143 REVISION 1
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "14"	NO INDICATIONS NOTED	X	N/A
" "15"	" " "	X	
" "16"	" " "	X	
" "17"	" " "	X	
N/A	N/A	N/A	

EXAMINER Gerard R. Lamm LEVEL II DATE 9/25/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamm LEVEL III DATE 9-25-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANII R Villadanes DATE 9/29/93

DATA SHEET NO. 1217-059
THERMOMETER S/N MR-92-04
TEMPERATURE 72 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED CHEMICAL & VOLUME CONTROL ISO/DWG/SK. # CPL-143 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-S	93F03K	5 MINUTES
DEVELOPER	"	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
B	PT EXAM OF REJECTABLE VT EXAM. NO INDICATIONS NOTED.	X	N/A
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 10-11-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-11-93
REVIEWER [signature] DATE 10/12/93
REVIEWER [signature] ANII DATE 10/13/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-011
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Chemical & Volume Control	Component Name: Support/Hanger	Component ID: 143A
Drawing/Location: CPL-143 R/1		
☒ VT-3 Procedure: SP-123c Rev. C	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sim Level: II Date: 9-28-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

Reviewed: Scott Lowe 9-29-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B Wilder Date: 9/29/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Palladares 9/29/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-008
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CHEM. & Volume Cont.	Component Name: HYDRAULIC SNUBBER	Component ID: 143B
Drawing/Location: CPL-143B (Rev 9-25-93) / CPL 143 R/1 / RX Bldg. 228' El. N. Above Sump.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☒ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☐ Variable Support	

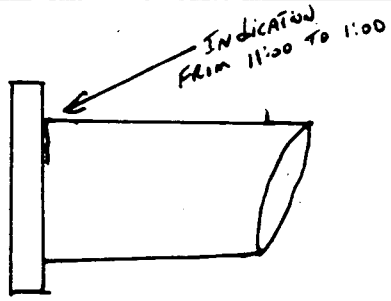
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges	✓		1½" x ⅜" x 1/16" cut in weld (See sketch below)
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: 4 9/32"	Stroke: N/A	S/N 25

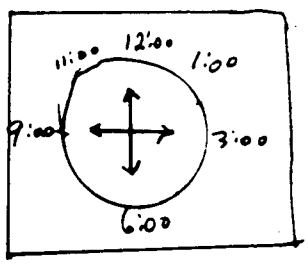
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-25-93

Examiner: N/A Level: N/A Date: N/A

Comments:





Reviewed: Scott Lawson 9-27-93

View Looking SOUTH WEST

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: [signature] Date: 10/28/93

DATA SHEET NO. 1217-059
THERMOMETER S/N MR-92-04
TEMPERATURE 72 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED CHEMICAL & VOLUME CONTROL ISO/DWG/SK. # CPL-143 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-S	93F03K	5 MINUTES
DEVELOPER	"	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
B	PT EXAM OF REJECTABLE VT EXAM. NO INDICATIONS NOTED.	X	N/A
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 10-11-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-11-93
REVIEWER [signature] DATE 10/12/93
REVIEWER [signature] ANII DATE 10/13/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-063
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: Aux. Spray Line	Component Name: Support	Component ID: H
Drawing/Location: CPL-143		
☒ VT-3 Procedure: SP-1230 Rev. 0		~~N/A~~ VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote ~~N/A~~	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other Neutral Gray Card	Type of Component Support: ~~N/A~~ Hydraulic Snubber ~~N/A~~ Mechanical Snubber ☒ Support/Hanger ~~N/A~~ Constant Support ~~N/A~~ Variable Support	

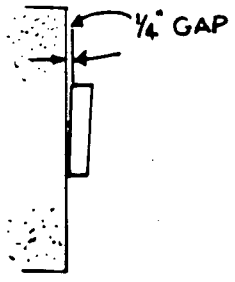
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support	X	N/A	1/4" GAP
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

~~N/A~~ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth A. Hamm Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass Acceptable per Site Memo TSE-93-ED-
☐ Fail

ISI Reviewer: Richard O. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-083
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CHEMICAL & VOL. CONTROL	Component Name: SUPPORT / HANGER	Component ID: 143-H1
Drawing/Location: CPL-143 R/1 / R.B. Bldg - Floor El. 228' outside crane wall		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ N/A Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

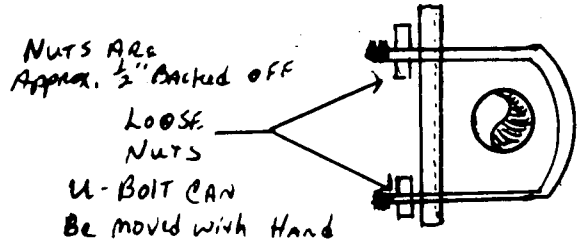
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		U-BOLT VERY LOOSE, SEE SKETCH BELOW
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-EA

ISI Reviewer: Richard B. Weber Date: 10/28/93

AWH A Wallace 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-102
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 143-H2
Drawing/Location: CPL-143 R/1 / RX, Bldg. 228' - Annulus		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: NA	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/10-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Balladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-097
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Support / Hanger	Component ID: 143-K
Drawing/Location: CAL-143R/1 / Rx. Bldg. 228' NEAR DOOR AT S/G C BAY		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/11/93

AN11 RB Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Support/Hanger	Component ID: 143-L
Drawing/Location: CPL-143 R/1 / Rx. Bldg 228 Near Steps on "C" DOOR 5/6		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

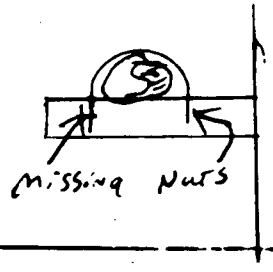
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-28-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B Wilson 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230 092
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Support / Hanger	Component ID: 143-M
Drawing/Location: CPL-143 Rev 1 / RX. Bldg. 10-6-93		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/11/93

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-062
Page 1 of 1

Project HBR 2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: N
Drawing/Location: CPL-143		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

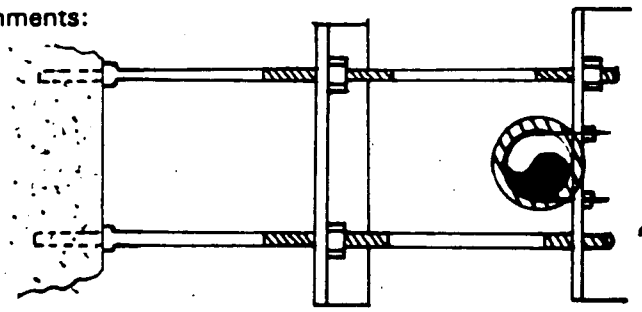
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION NOTED
Mechanical interference	N/A	X	" " "
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	MISSING NUT
Loose/missing parts	X	N/A	" "
Abnormal wear	N/A	X	NO INDICATION NOTED
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth L. Hance Level: II Date: 10-7-93

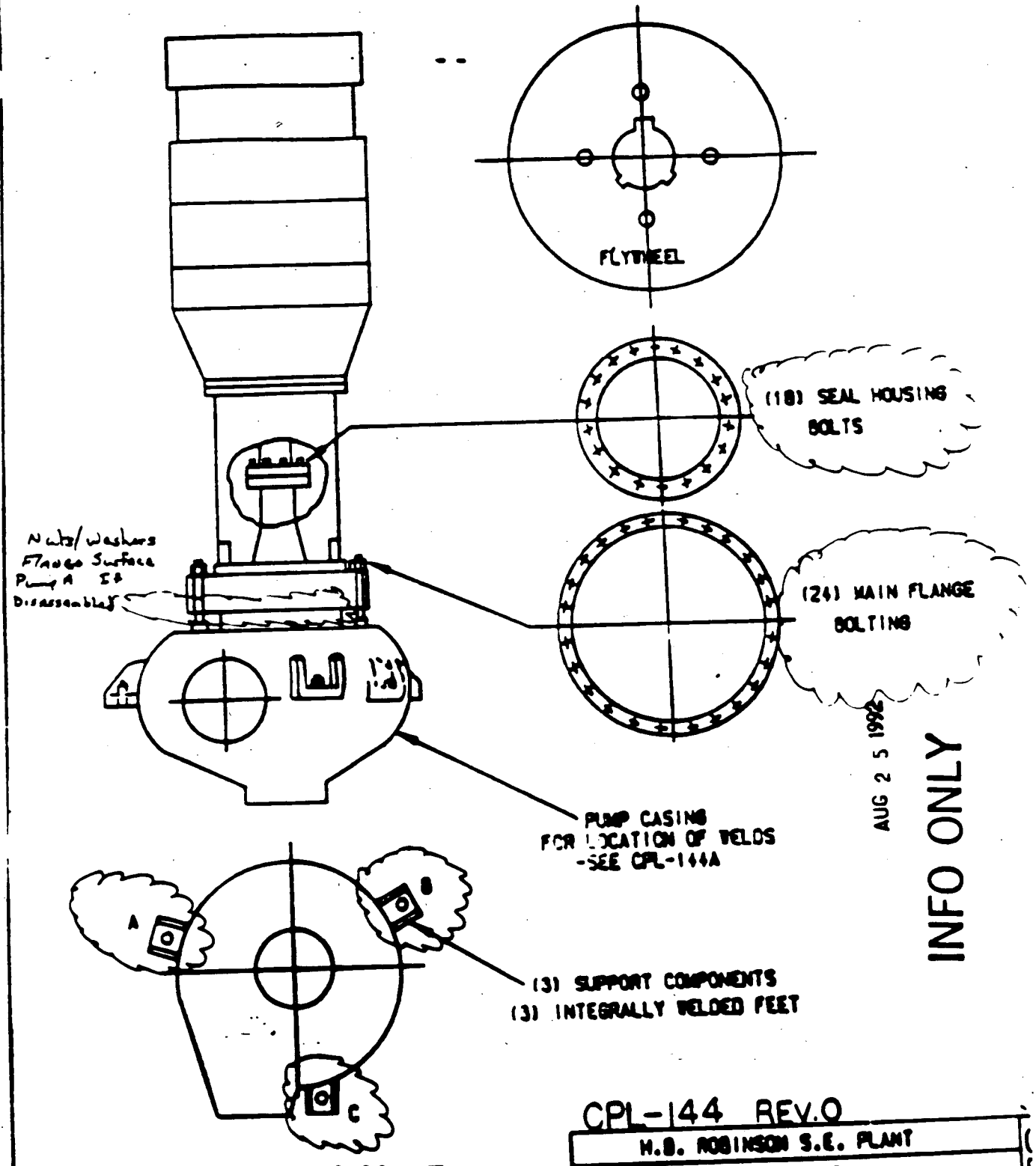
Examiner: Level: Date:

Comments:



(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber 10/27/93



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-1D618 Sh. 56					
CP & L P.O. No. CPL 51					
CHNG. REV.	FIELD VERIFIED BY	DRAWN BY	CHKD BY	APPD BY	DATE
2	RBM	CPL	CLO	CLO	12/13/91

CPL-144 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION REACT-COOLANT PUMPS A, B, & C	
LINE NO.	CPL-144 REV.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

SL 9-29-93
Report No. 1230-010
Page 1 of 1

Project H B R Job No. PSI ☐ ISI ☒

System: REACTOR COOLANT	Component Name: RCP "A" FLYWHEEL	Component ID: 144A
Drawing/Location: CPL-144 R/O / RX. BLDG		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☐ Variable Support ☑ FLYWHEEL	

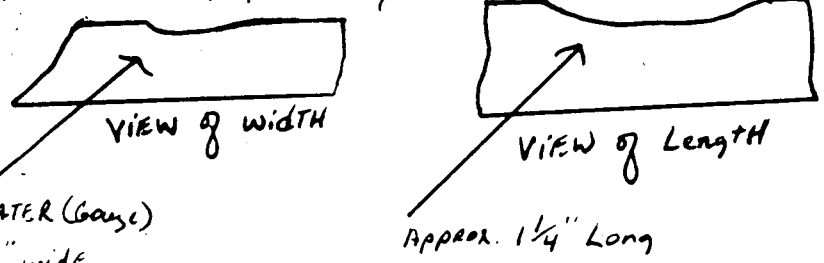
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges	✓		
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-27-93

Examiner: N/A Level: N/A Date: N/A

Comments: Reverification of previously recorded indication.



AREA is Approx. ⅛" deep.
And as of 9-27-93 HAS Red PRIMER painted over it
FAIRLY SMOOTH SURFACE

Gouge AREA WAS THE ONLY AREA EXAMINED

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 9/29/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 9/29/93

DISPOSITION OF FLYWHEEL GOUGE ON "A" RCP

PROBLEM DESCRIPTION:

A refurbished RCP motor (S/N 3S-75P342) was returned to H. B. Robinson during RFO 14 and installed on the "A" RCP. The flywheel was inspected prior to installation and a small gouge was noted.

BACKGROUND:

The flywheel cover was reinstalled and the pie blocks replaced over the "A" pump bay before the NDE report on the flywheel was finished. It would have taken a significant amount of time and effort to reexamine the gouge and make appropriate repairs at this point, so Westinghouse was contacted. The original instructions from Westinghouse were to inspect the gouge for any burrs or raised metal and measure the taper the next time the flywheel cover was removed. If the taper was not 3:1 or greater, the gouge was to be blended out to this ratio.

The gouge was examined again during RFO 15 and was marked "fail" because the taper was only 2:1. Westinghouse was contacted and it was discovered that the ISI reviewer's and the Westinghouse definition of taper were different. The ISI reviewer defined the taper as 1/2 of the length or width (whichever was shorter) divided by the depth (see attached ISI report). Mark Welcer, a Westinghouse design engineer, said that his definition of taper was the full length or width divided by the depth, a 4:1 ratio. He said that the gouge should not pose any problems on the flywheel.

CONCLUSION:

As per my telephone conversation with Mark Welcer and Russ Muth, Westinghouse site service manager for H. B. Robinson, the flywheel for the "A" RCP is considered acceptable to operate.

RCP Component Engineer — Date: 11/4/93

Manager - Component Engineering — Date: 11/4/93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-002
Page 1 of 1

Project | Job No. | Unit 1 ☐ 2 ☒

System: REACTOR COOLANT	Component Name: PUMP BOLTING	Component ID No.: REACTOR COOLANT PUMP A
Class: ONE	Location/Isometric: 228'-CV / CPL-144 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
18 SEAL HOUSING BOLTS	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

(BOLTS IN-PLACE)

Examiner: Eugene Singa Level: II Date: 9-22-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: Scott Lam LIII 9-22-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard B. Weber Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93

ANII R Valladares 9.23.93

Visual Examination Data Sheet
For Nuts, Bolts, Studs & Washers

Report No. 1237-001
Page 1 of 1

Project | Job No. | Unit 1☐ 2☒

System: REACTOR COOLANT	Component Name: Pump A	Component ID No.: REACTOR COOLANT Pump A
Class: ONE	Location/Isometric: CV-ELEV. 228' / CPL-144 R/O	
Procedure: SP-1237 Rev: 0		Method: VT-1 ☒
Replication Yes ☐ No ☒	Direct ☒ Remote ☐	Video Recording No: N/A
Equipment Used: FLASHLIGHT, 18% NEUTRAL GRAY CARD		

Adverse Condition Present	Cracks		Corrosion		Thread Damage		Missing or Loose Items		Wear		Bending, Twisting or Deformation		Comment	
Item Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Sat	Usat
24 MAIN Flange Studs	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	N/A	✓	✓	N/A
24 MAIN FLANGE NUTS		✓		✓		✓		✓		✓		✓	✓	
N/A		N/A		N/A		N/A		N/A		N/A		N/A	N/A	

Comments/Notes: NO INDICATIONS NOTED

STUDS, NUTS IN PLACE

Examiner: Eugene Stay Level: II Date: 9-22-93

Examiner: N/A Level: N/A Date: N/A

Comments/Notes:

Reviewed: Scott Lamm III 9-22-93

(ISI Use Only)
ISI Review: Per preliminary assessment these items are considered to be:
☑ Pass (EER, EWR, Etc. - If Applicable)
☐ Fail (INOP - Unsat.)

ISI Reviewer: Richard O. Weber Date: 9/22/93

QA NDE ISI 6, Rev. 1, 07/93

AN II RA Valladares 9-23-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-094
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: RC	Component Name: Support/Hanger	Component ID: 144-A
Drawing/Location: CPL-144 R/O / Rx. Bldg. 228' Floor Elev. Pen Bay "A"		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sapp Level: II Date: 10-9-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-095
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RC	Component Name: Support / HAnger	Component ID: 144-B
Drawing/Location: CPL-144 R/0 / Rx. Blg. - 228'-Floor Flev. Pump BAY "A"		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-9-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard S. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Palladano 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-096
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: RC	Component Name: Support/Hanger	Component ID: 144-C
Drawing/Location: CPL-144 R/O / Rx. Bldg. 228' FLOOR Elev. Pump Bay "A"		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sing Level: II Date: 10-9-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/11/93

ANII RBValladares 10/11/93

DATA SHEET NO. 1225-001

PAGE 1 OF 4

CPL-144 REV.0, RC Pump A

Main Flange Bolting, No. 3,4,6,7,10,12,14,20,23

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1225

REV. 0

CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7

Serial No. 37276-4172

Sweep Length 2.08 Delay 7.81

Range 2.5

Gain (coarse) 40 dB

Gain (fine) 24 dB

Reference Sensitivity 64 dB

Remarks: N/A

SEARCH UNIT

Serial No. W11025

Size .25 x .25

Frequency 5.0 MHz

Mode Surface Wave

Nom. Angle 90 °

Measured Angle N/A °

Cable Type RG174/U

Cable Length 12'

Remarks: N/A

CALIBRATION BLOCK

No. CPL-62

"T" N/A Dia. 3.3

Temperature 85 °F

Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]

Metal Path [X] Depth [N/A]

Each Major Screen Div. = _____

Remarks _____

COUPLANT

Brand Demin Water

Batch No. N/A

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	
2	90	45	7	40	
3	80	40	8	30	
4	70	35	9	20	
5	60	30	10	10	

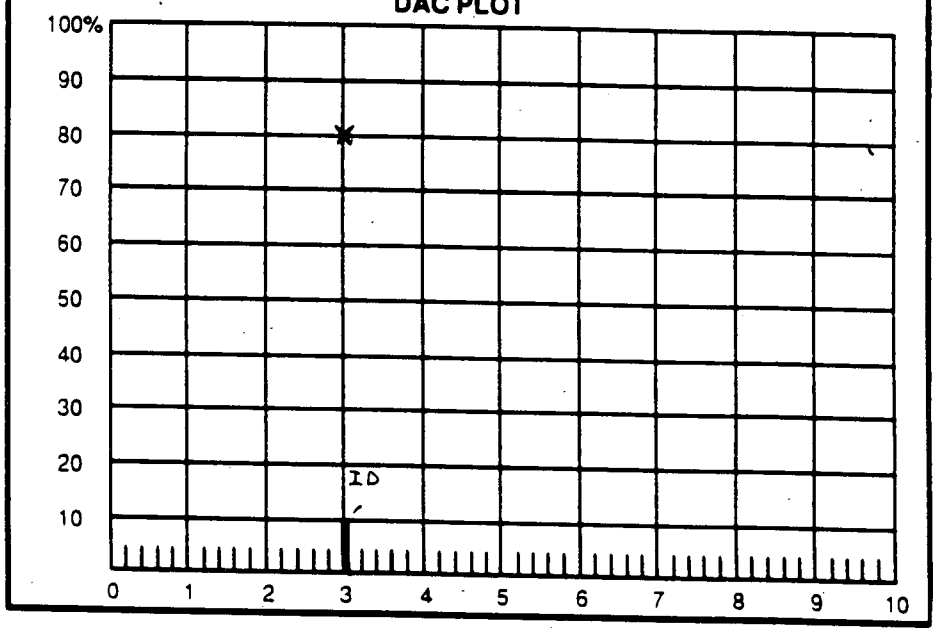
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	20
40	+6	79
20	+12	78

CAL. CHECKS

	TIME
INITIAL CAL.	1425
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1550

DAC PLOT



REMARKS: 3 major screen divisions at 80% FSH at the ID Notch N/A

EXAMINERS	1	[signature]	LEVEL II	DATE 10-10-92
	2	N/A	LEVEL N/A	DATE N/A
REVIEWERS	1	[signature]	LEVEL III	DATE 10-10-92
	2	[signature]	LEVEL N/A	DATE 10/11/92
	3	[signature]	LEVEL ANII	DATE 10/11/92

DATA SHEET NO. 1225-001
PAGE 2 OF 4
CPL-144 REV.0, RC. Pump A, Main Flange Bolting, No. 3,4,6,7,10,12,14,20,23

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1225
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Kraut
Serial No. 27276-3702
Sweep Length 8.40 Delay 8.60
Range 2.5
Gain (coarse) 40 dB
Gain (fine) 28 dB
Reference Sensitivity 68 dB
Remarks: N/A

SEARCH UNIT

Serial No. W11025
Size .325
Frequency 6.0 MHz
Mode Shear
Nom. Angle 70 °
Measured Angle N/A °
Cable Type RG174/U
Cable Length 12'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-62
"T" N/A Dia. 3.3
Temperature 85 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .32
Remarks 3.2" Screen Range N/A

COUPLANT

Brand Demin Water
Batch No. N/A

VERTICAL LINEARITY

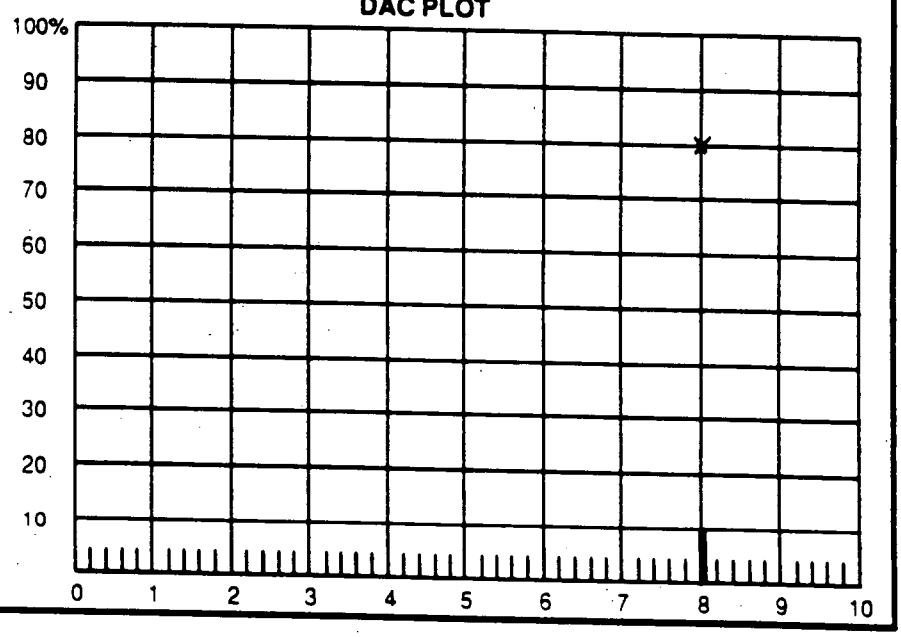
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	19
40	+6	80
20	+12	79

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1415
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1550

REMARKS: 8 major screen divisions at 80% FSH 70° Fwd N/A

EXAMINERS 1 [signature] LEVEL II DATE 10-10-93
2 N/A LEVEL N/A DATE N/A

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1225-001
PAGE 3 OF 4
CPL-144 Rev. 0 RC Pump A
main Flange Bolting No. 34, 47, 14, 42, 14, 2923

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1225
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.32 Delay 8.06
Range 2,5
Gain (coarse) 40 dB
Gain (fine) 34 dB
Reference Sensitivity 74 dB
Remarks: N/A

SEARCH UNIT

Serial No. W11025
Size .325" de-focused
Frequency 6.0 MHz
Mode Shear
Nom. Angle 70 °
Measured Angle 70 °
Cable Type
Cable Length 12'
Remarks: Backward looking transducer

CALIBRATION BLOCK

No. CPL-62
"T" N/A Dia. 3.3"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = .32
Remarks 3.2" Screen

COUPLANT

Brand Demin Water
Batch No. N/A

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

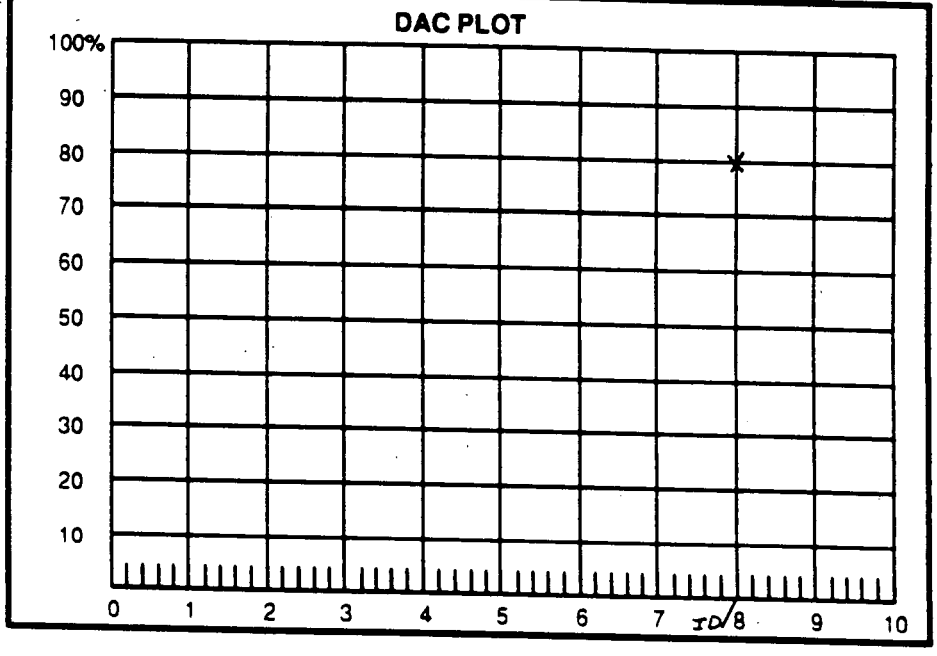
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	1420
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1550

DAC PLOT



REMARKS: X = ID Notch

EXAMINERS 1 Tim Adgar LEVEL II DATE 10-10-93
2 N/A LEVEL N/A DATE N/A

REVIEWERS 1 Matt Lowe LEVEL III DATE 10-10-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 R P Balladares LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1225-001
PAGE 4 OF 4

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM RC Pump A
ISO/DWG. NO. CPL-144 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 °F

EXAM ITEM

Main Flange Bolting 3,4,6,7,10,12,14,20,23

SCAN 70 Bwd ° SCAN dB 80				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Geometric Reflector From End of Stud (Outside Exam Area)

SCAN 70 Fwd ° SCAN dB 74				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Geometric Reflector From End of Stud (Outside Exam Area)

SCAN 90 ° SCAN dB 70				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Geometric Refector From End of Stud (Outside Exam Area)

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

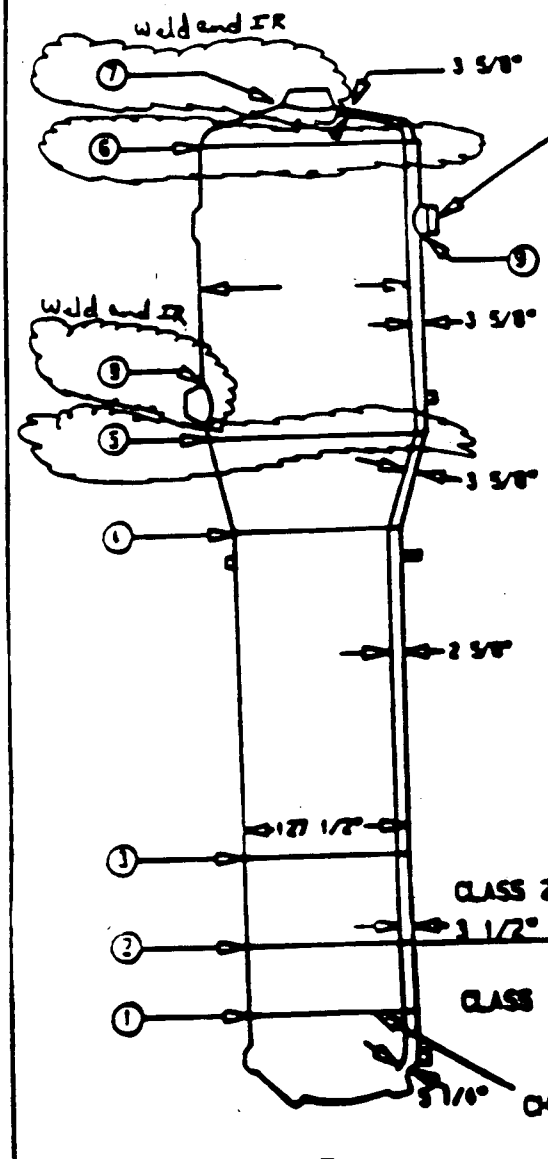
EXAMINERS:
1 C.D. Jewell LEVEL II DATE 10-10-93
2 Tim Addison LEVEL II DATE 10-10-93

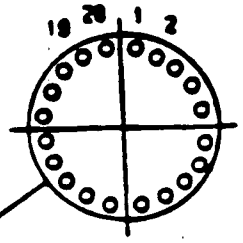
REVIEWERS:
1 [signature] LEVEL III DATE 10-10-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL A/II DATE 10/11/93

NES 9/90 – REV. 1

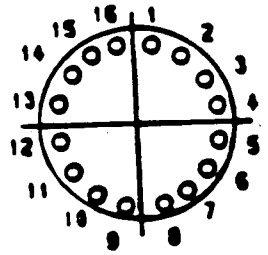
NUCLEAR ENERGY SERVICES, INC.

CP & L Dwg. No. H882-10W18 SH. 61					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPLL	CLO	CLO	12/12/89

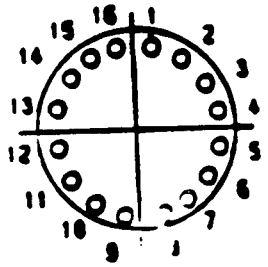




SECONDARY MANWAY (1)



HOTLEG MANWAY



COLDLEG MANWAY

AUG 2 5 1992

INFO ONLY

NOTES:

1. CLASS 2 PORTION WAS CPL-201

CPL-205 REV. 0

H.B. ROBINSON S.E. PLANT
UNIT NO. 2
DESCRIPTION: STEAM GENERATOR A

ILIAD NO. [illegible] REV. 1

I certify that the image contained on this frame was made in the normal and regular course of business on the date [illegible] and that it is an accurate reproduction of

DATA SHEET NO. 1218 - 003
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 3½ INCHES
MATERIAL C/S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED STEAM GENERATOR "A" ISO/DWG/SK. # CPL-205 REVISION 0

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 831067
Color RED

EQUIPMENT

Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 6	EXAM LIMITED 18" DUE TO 9 INSULATION SUPPORTS. NO RECORDABLE INDICATIONS	X	N/A

EXAMINER Steve Wallum LEVEL II DATE 9-29-93
EXAMINER Bernard J. Hann LEVEL II DATE 9-29-93
REVIEWER Scott Lam LEVEL III DATE 9-30-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Ann M. Waldadanis DATE 10/5/93

DATA SHEET NO. 1218-004
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 3.5" INCHES
MATERIAL C/S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED STEAM GENERATOR "A" ISO/DWG/SK. # CPL-205 REVISION 0

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT

Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 7	NO RECORDABLE INDICATIONS	X	N/A
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 9-29-93
EXAMINER Donald R. Mase LEVEL II DATE 9/29/93
REVIEWER Scott Lamm LEVEL III DATE 9-30-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Anil R. Wellandakar DATE 10/5/93

DATA SHEET NO. 1218-009
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL C/S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED STEAM GENERATOR A ISO/DWG/SK. # CPL-205 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 831067
Color RED

EQUIPMENT
Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 8	NO RECORDABLE INDICATIONS	X	N/A
	N		
	A		

EXAMINER Tim Oddsen LEVEL II DATE 10-2-93
EXAMINER Steve Wollum LEVEL II DATE 10-2-93
REVIEWER [signature] LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER DAVID R. Valladares DATE 10/5/93

DATA SHEET NO. 1222-003
PAGE 1 OF 9
CPL-205 REV.0 / Weld No. 6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 4.59 Delay 7.86
Range 2.5
Gain (coarse) 0 dB
Gain (fine) 28 dB
Reference Sensitivity 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. G09014
Size 1"
Frequency 2.25 MHz
Mode Ø Longitudinal
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG58A/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 79 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X] 0.400
Each Major Screen Div. = ~~0.438~~ CJ 10-6 4.3
Remarks: N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

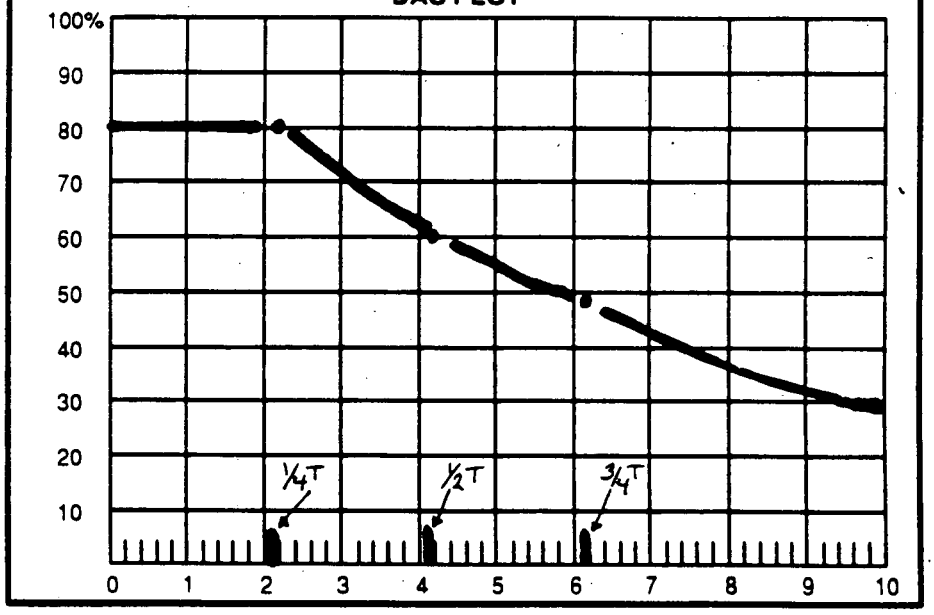
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	77
20	+12	77

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1355
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1825

REMARKS: N/A

EXAMINERS 1 Chris D. Judd/CD Judd LEVEL II DATE 9-29-93
2 Benjamin Snyder LEVEL II DATE 9-29-93

REVIEWERS 1 [signature] LEVEL III DATE 10/4/93
2 Richard S. Weber LEVEL N/A DATE 10/7/93
3 R.R. Sullivan LEVEL ANII DATE 10/7/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-003
PAGE 2 OF 9

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Stm. Gen. A
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 86 °F

EXAM ITEM: Weld No. 6

SCAN 0 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Chris O. Judd/CQN Level II DATE 9-29-93
2 Benjamin Santos LEVEL II DATE 9-29-93

REVIEWERS:
1 _____ LEVEL III DATE 10/4/93
2 Richard Bowden LEVEL N/A DATE 10/7/93
3 _____ LEVEL ANII DATE 10/7/93

DATA SHEET NO. 1222-003
PAGE 3 OF 9
CPL-205 REV.0, Weld #6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-3784
Sweep Length 2.70 Delay 7.56
Range 10"
Gain (coarse) 0 dB
Gain (fine) .30 dB
Reference Sensitivity 30 dB
Remarks: N/A

SEARCH UNIT

Serial No. G10188
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG58A/U
Cable Length 6'
Remarks: Exit Point .70" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .75
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

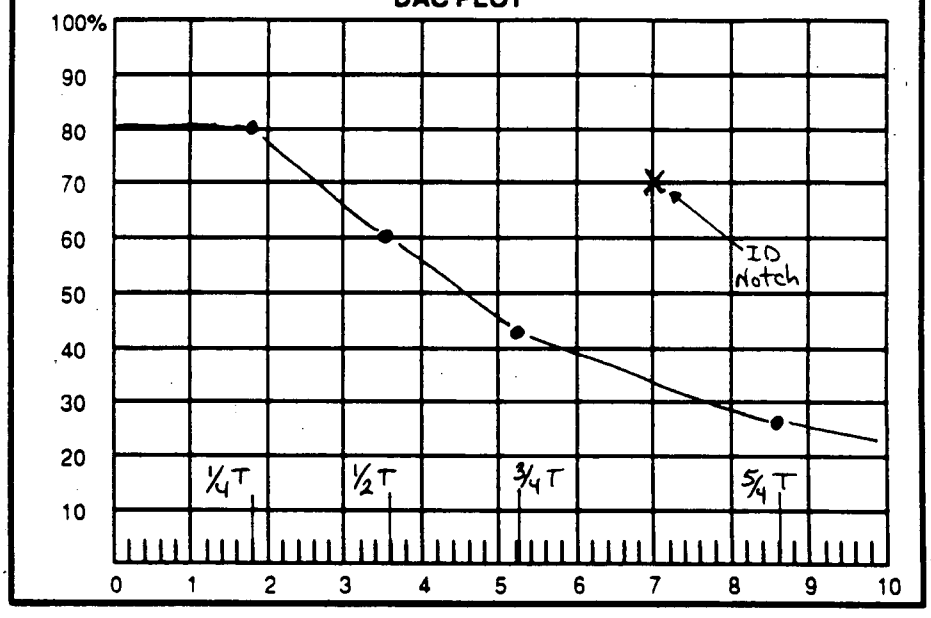
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	21
3	80	40	8	30	16
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0840
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1420

REMARKS: N/A

EXAMINERS 1 Chris O. Judd / Chris O. Judd LEVEL II DATE 9-30-93
2 Brianna Sanders LEVEL II DATE 9-30-93

REVIEWERS 1 [signature] LEVEL III DATE 10/4/93
2 Richard B. Weber LEVEL N/A DATE 10/7/93
3 R.P. Balladares LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-003
PAGE 4 OF 9
CPL-205 REV. 0, Weld #6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 9.55 Delay 7.18
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. C09104
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG58A/U
Cable Length 6'
Remarks: Exit Point To Tip of Wedge is .75"
N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 72 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

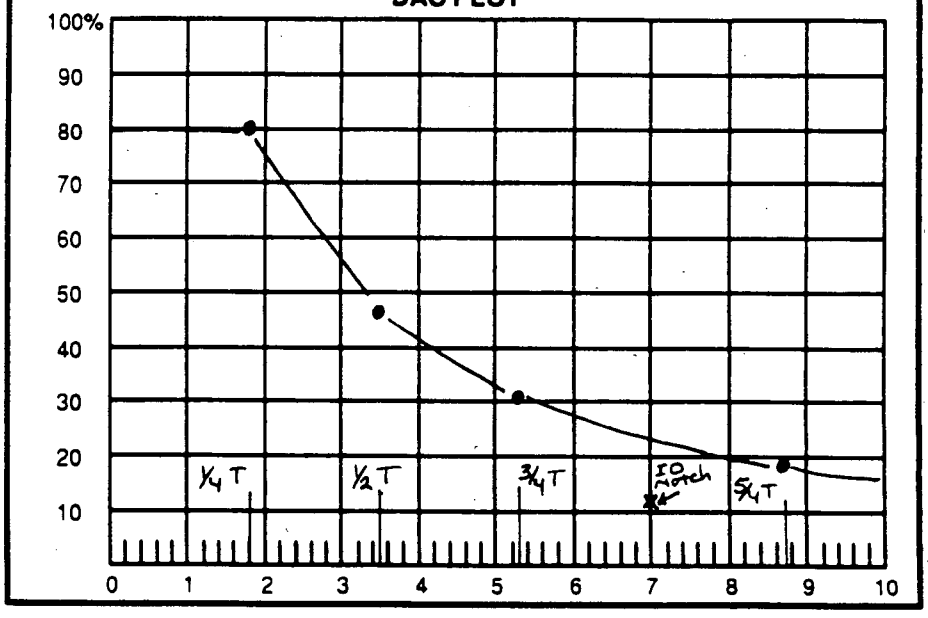
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1925

DAC PLOT



REMARKS: N/A

EXAMINERS	1 Chris D. Judd/Cl D. Judd	LEVEL II	DATE 9-30-93
	2 Benjamin Smith	LEVEL II	DATE 9-30-93
REVIEWERS	1	LEVEL III	DATE 10/4/93
	2 Richard B. Weber	LEVEL N/A	DATE 10/7/93
	3 R Balladares	LEVEL ANII	DATE 10/7/93

DATA SHEET NO. 1223-S2-003 (3 S2 7-4-93)

PAGE 5 OF 9

EXAM ITEM

Weld No. 6

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM STM. GEN. A

ISO/DWG. NO. CPL-205 REV. 0

THERMOMETER S/N 962

COMPONENT TEMP. 86 ° F

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	X	N/A	N/A	X	X	N/A

REMARKS: See attached drawing for scan obstructions.
See attached profile drawing for geometric indication.
N/A

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: See attached drawing for scan obstructions
N/A

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: See attached drawing for scan obstructions.
N/A

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: See attached drawing for scan obstructions
N/A

EXAMINERS:

1 Chris D. Judd/Ch D. Judd LEVEL II DATE 9-30-93

2 Benjamin Sanders LEVEL II DATE 9-30-93

REVIEWERS:

1 [signature] LEVEL III DATE 10/4/93

2 Richard B. Weber LEVEL N/A DATE 10/7/93

3 [signature] LEVEL ANII DATE 10/7/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM

Weld No. 6

ISO/DWG. NO.

CPL-205 REV. 0

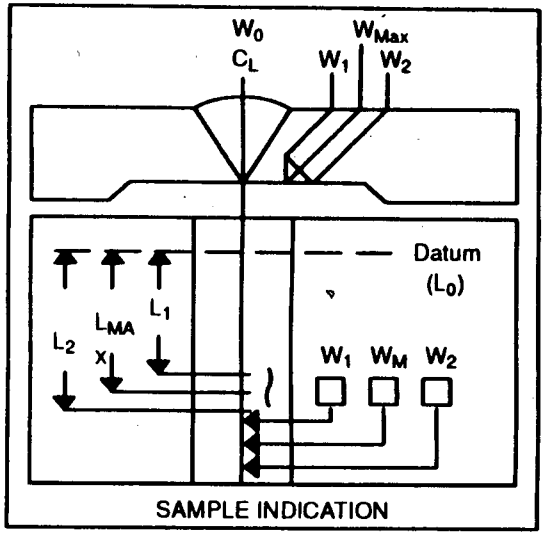
ULTRASONIC INDICATION REPORT SHEET

- [N/A] PIPING WELDS
- [X] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1222-003

PAGE 6 OF 9

SEARCH UNIT ANGLE 44 ° W_0 LOCATION $\mathcal{C}_L$ of Weld L_0 LOCATION $\mathcal{C}_L$ of Long'L Seam



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX	FWD 50% DAC*		BACKWARD 50% DAC*		L_1	L	L_2	RBR	S.U.	REMARKS
		W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	50%	3.8	5.0	N/A	N/A	N/A	N/A	N/A	29'-3.5"	N/A	N/A	Shell Side	See attached drawing for profile.
2	50%	3.75	5.25	N/A	N/A	N/A	N/A	N/A	29'-3.5"	N/A	N/A	Head Side	See attached drawing for L_0 location.
						N/A							N/A

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Chris D. Judd / Cl D. Judd LEVEL II DATE 9-30-93

2 [signature] LEVEL II DATE 9-30-93

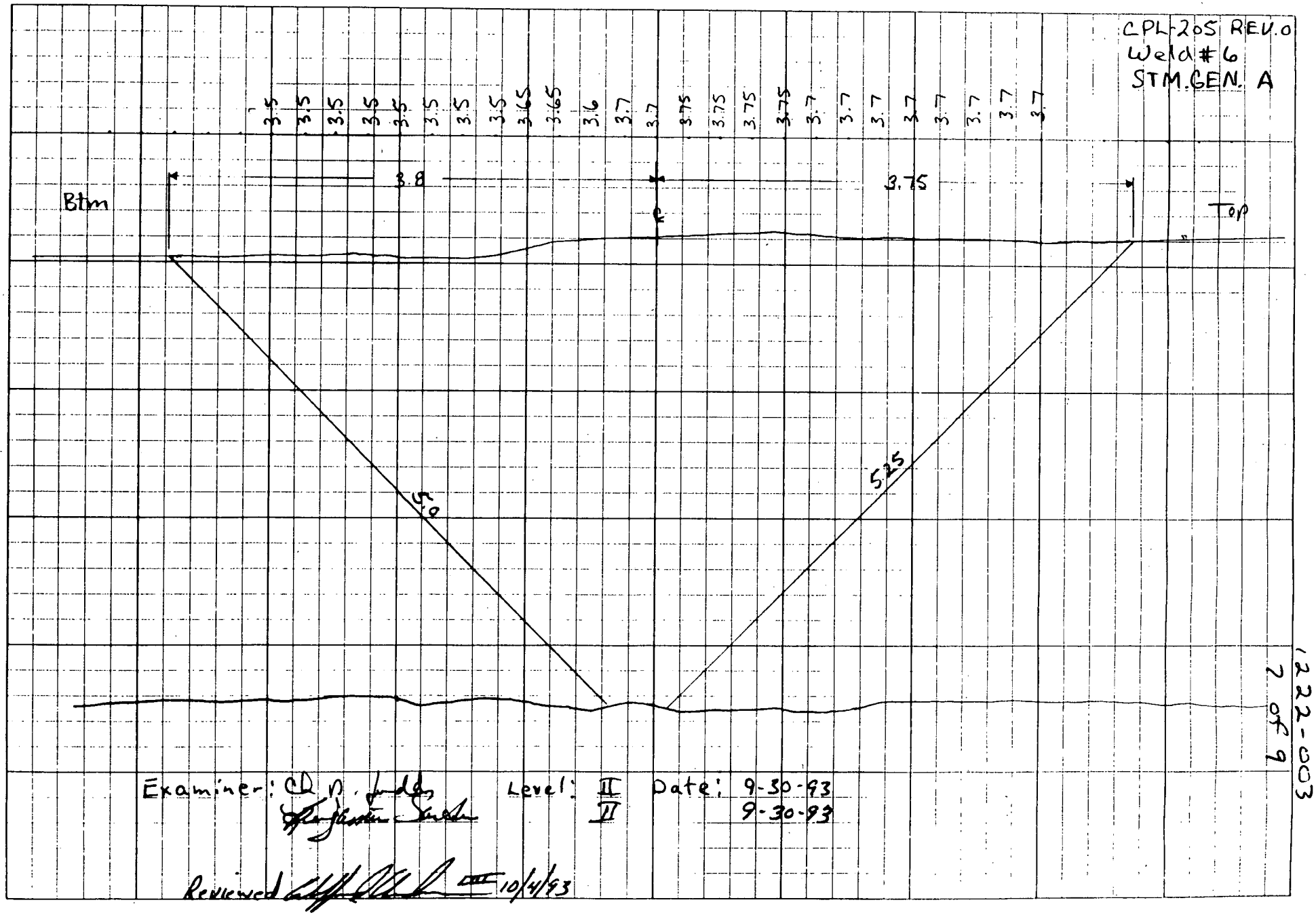
REVIEWERS 1 [signature] LEVEL III DATE 10/4/93

2 [signature] LEVEL N/A DATE 10/7/93

3 [signature] LEVEL QA/C DATE 10/7/93

NES 000

NUCLEAR ENERGY SERVICES, INC.


CPL-205 REV.0
Weld #6
STM.GEN. A
3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.65 3.65 3.6 3.7 3.7 3.75 3.75 3.75 3.75 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7
3.8
3.75
Btm
Top
5.0
5.25
Examiner: CL N. Judd
Benjamin Smith
Level: II
II
Date: 9-30-93
9-30-93
Reviewed 10/4/93

CPL-205 REV 0

1223-003
8 of 9

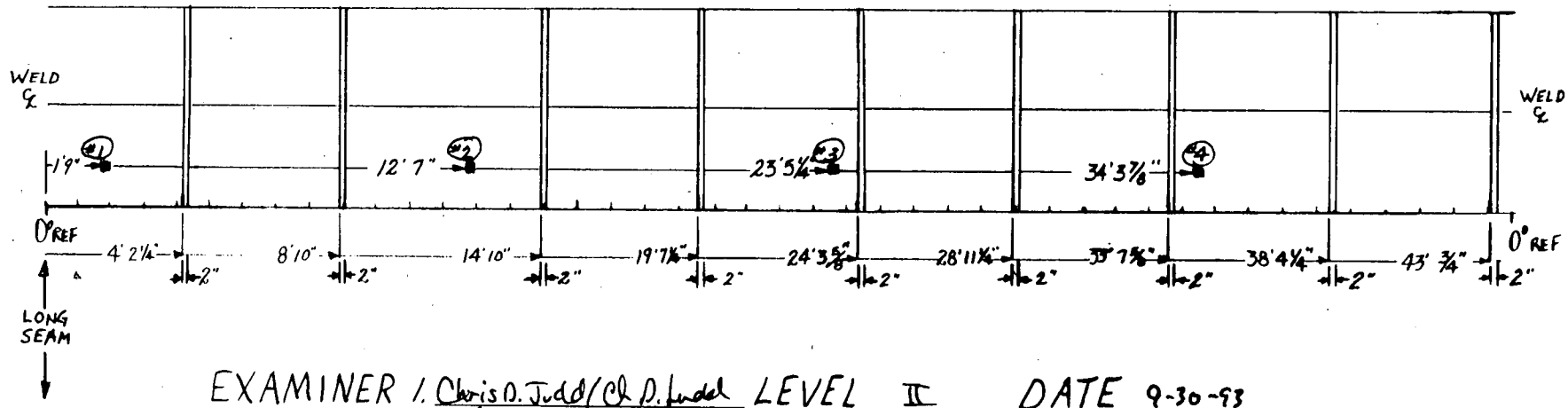
WELD #6

STEAM GENERATOR A

WELD WIDTH 2 3/4"

INSULATION PADS
MEASUREMENT
FROM ℄ OF WELD

#1.	5 1/8"	WIDTH = 2 3/8"
2.	5"	WIDTH = 2 7/8"
3.	5 1/8"	WIDTH = 2 3/4"
4.	5"	WIDTH = 2 7/8"



EXAMINER 1. Chris D. Judd/Ch D. Judd LEVEL II DATE 9-30-93
2. Benjamin Sander LEVEL II DATE 9-30-93

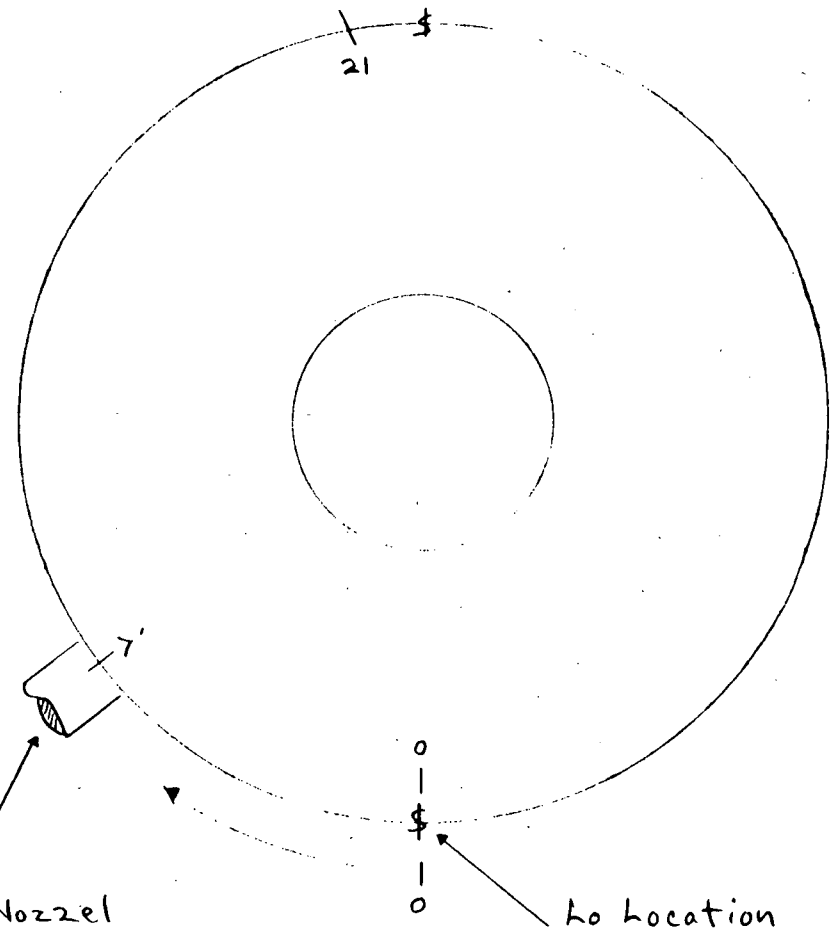
PAGE__OF__

Reviewed LTM 10/4/93

1223-003
9 of 9

STM. GEN. A

Lo Location Weld No. 6
CPL-205 REV. 0



LKG DN

Feedwater Nozzel

Lo Location
C_L of vessel Longitudinal Seam

Examiner: Chris D. Judd / Chris D. Judd Level: II Date: 9-30-93
Benjamin Sanders II 9-30-93

Reviewed [signature] LIII 10/4/93

DATA SHEET NO. 1222-002
PAGE 1 OF 5
CPL-205 REV.0 / Weld No. 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 4.59 Delay 7.86
Range 2.5
Gain (coarse) 0 dB
Gain (fine) 28 dB
Reference Sensitivity 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. G09014
Size 1"
Frequency 2.25 MHz
Mode Ø Longitudinal
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG58A/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 79 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X] 0.400
Each Major Screen Div. = ~~0.438~~ 10.3
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

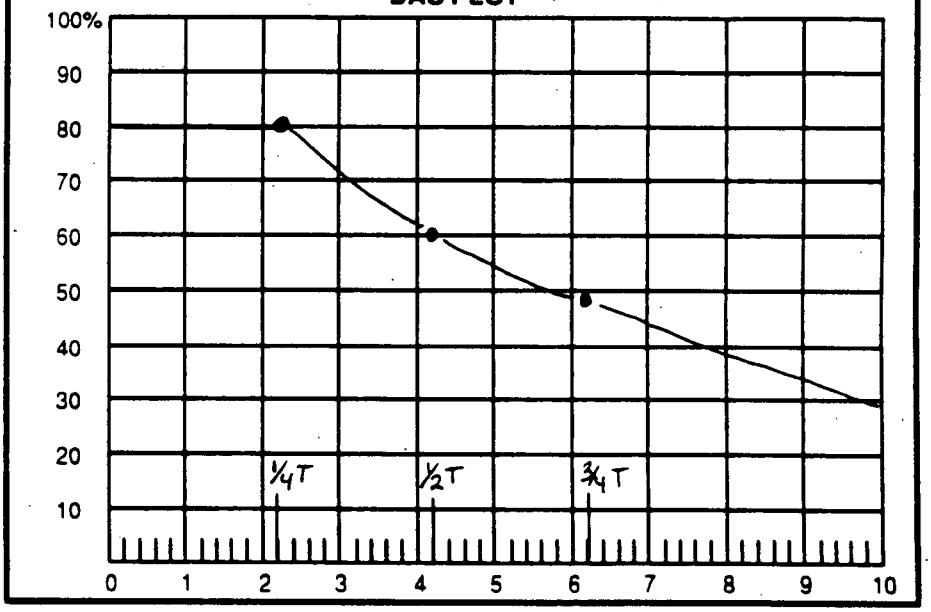
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	77
20	+12	77

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1355
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1825

REMARKS: N/A

EXAMINERS	1 Chris D. Judd / C D. Judd	LEVEL II	DATE 9-29-93
	2 [signature]	LEVEL II	DATE 9-29-93
REVIEWERS	1 [signature]	LEVEL III	DATE 10-3-93
	2 [signature]	LEVEL N/A	DATE 10/4/93
	3 [signature]	LEVEL ANII	DATE 10/7/93

DATA SHEET NO. 1222-002
PAGE 2 OF 5
CPL-205 REV. 0, Weld #7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. _____

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 2.70 Delay 7.56
Range 10"
Gain (coarse) 0 dB
Gain (fine) 30 dB
Reference Sensitivity 30 dB
Remarks: N/A

SEARCH UNIT

Serial No. G10188
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG58A/U
Cable Length 6'
Remarks: Exit Point .70" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 76 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .75
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

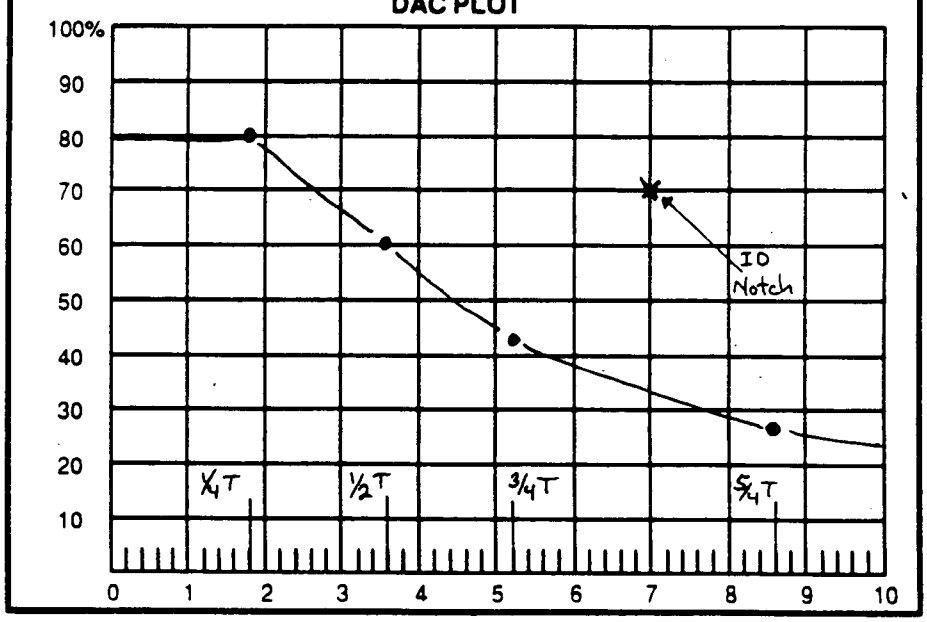
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	21
3	80	40	8	30	16
4	70	35	9	20	11
5	60	30	10	10	6

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0840
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1420

REMARKS: N/A

EXAMINERS	1	[signature]	LEVEL	II	DATE 9-30-93
	2	[signature]	LEVEL	II	DATE 9-30-93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-3-93
	2	[signature]	LEVEL	N/A	DATE 10/7/93
	3	[signature]	LEVEL	N/A	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-002
PAGE 3 OF 5
CPL-205 REV.0, Weld #7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO.

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 9.55 Delay 7.18
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. C09104
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG58A/U
Cable Length 6'
Remarks: Exit Point To Tip of Wedge is .75"
N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 72 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

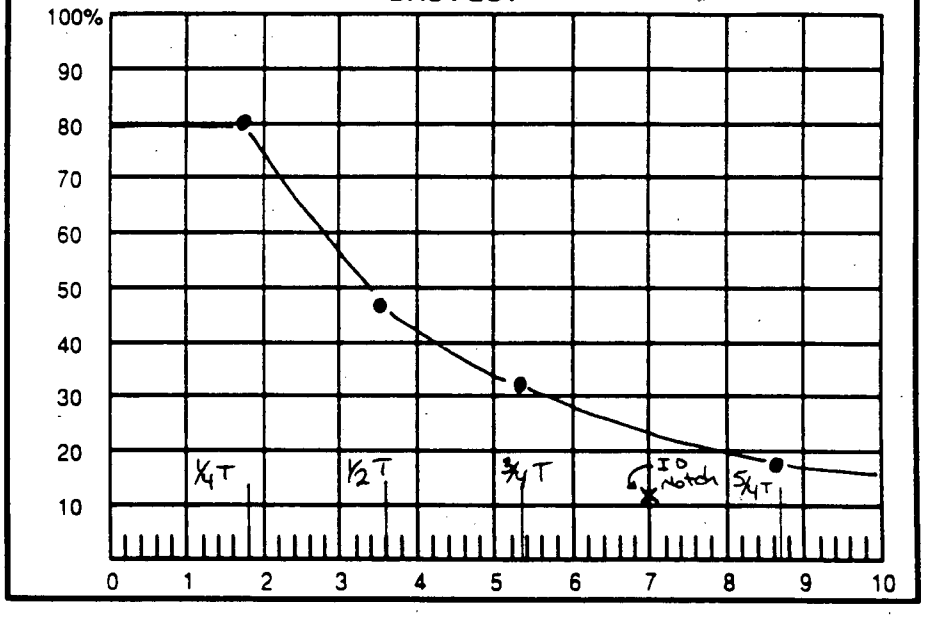
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1925

DAC PLOT



REMARKS: N/A

EXAMINERS
1 Chris D. Judd/CDJ LEVEL II DATE 9-30-93
2 Benjamin Graham LEVEL II DATE 9-30-93

REVIEWERS
1 Scott Levy LEVEL III DATE 10-3-93
2 Richard Wallace LEVEL N/A DATE 10/7/93
3 R Williams LEVEL ~~III~~ II DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-002
PAGE 4 OF 5
EXAM ITEM
Weld No. 7

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Stm. Gen. A
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 86 ° F

SCAN 0 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Chris D. Judd / Ch D. Judd LEVEL II DATE 9-29-93
2 LEVEL II DATE 9-29-93

REVIEWERS:
1 Scott LEVEL III DATE 10-3-93
2 Richard B. Weber LEVEL N/A DATE 10/7/93
3 R. Valladares LEVEL ANII DATE 10/7/93

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-002
PAGE 5 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM STM. GEN. A
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 88 °F

EXAM ITEM: Weld No. 7

SCAN 60° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, vessel side.

SCAN 60° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, vessel side

SCAN 45° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, vessel side

SCAN 45° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, vessel side

EXAMINERS:
1 Chris D. Judd/CDJudd LEVEL II DATE 9-30-93
2 [illegible] LEVEL II DATE 9-30-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-3-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL ANII DATE 10/7/93

SC 10-4-93 1228

DATA SHEET NO. ~~1228~~ 001

PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1228

REV. 0

CHANGE NO. N/A

CPL-205 #7 I.R. C.W. SCAN

INSTRUMENT

Model USK-7

Serial No. 27276-749

Sweep Length 5.26 Delay 2.38

Range 10"

Gain (coarse) 40 dB

Gain (fine) 20 dB

Reference Sensitivity 60 dB

Remarks: N/A

SEARCH UNIT

Serial No. 56760

Size .5"

Frequency 2.25 MHz

Mode SHEAR

Nom. Angle 45 °

Measured Angle 45 °

Cable Type (2) RG-58A/U

Cable Length 6'

Remarks: WEDGE #ABWS-1060

N/A

CALIBRATION BLOCK

No. CPL-64

"T" 12.0" Dia. N/A

Temperature 78 ° F

Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. ✓

Metal Path N/A Depth ✓

Each Major Screen Div. = 1"

Remarks N/A

COUPLANT

Brand ULTRAGEL II

Batch No. 093051

VERTICAL LINEARITY

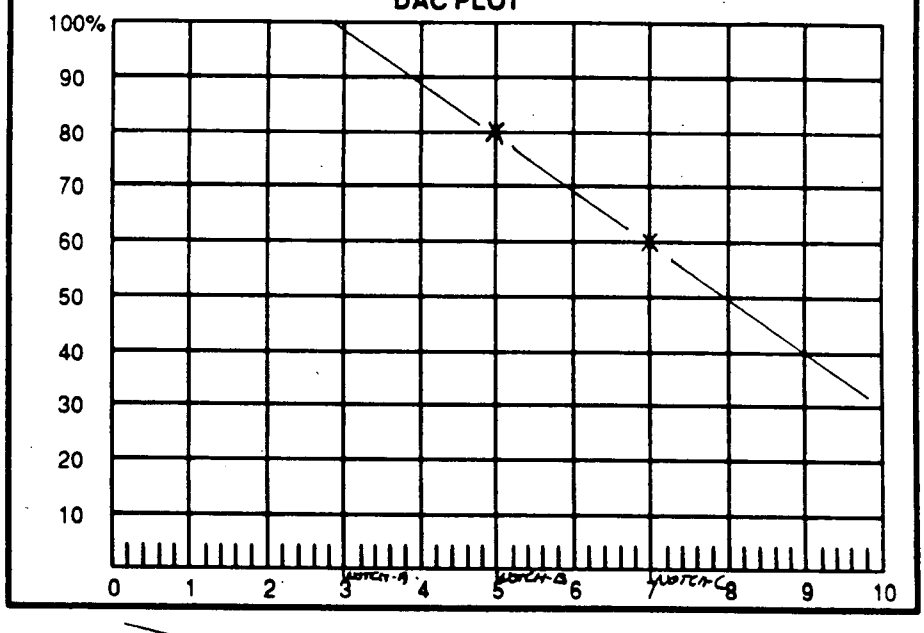
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1715
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1818

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/1/93

2 David H Martin LEVEL II DATE 10/1/93

REVIEWERS 1 Scott Langer LEVEL III DATE 10-4-93

2 Richard O. Weber LEVEL N/A DATE 10/7/93

3 R A Wallace LEVEL N/A DATE 10/7/93

DATA SHEET NO. 1223 SL 10-4-93 ~~1288~~-001

PAGE 2 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1228

REV. 0

CHANGE NO. N/A

CPL-205 #7 I.R. C.C.W. SCAN

INSTRUMENT

Model USK-7

Serial No. 27276-749

Sweep Length 5.26 Delay 2.38

Range 10"

Gain (coarse) 40 dB

Gain (fine) 20 dB

Reference Sensitivity 60 dB

Remarks: N/A

SEARCH UNIT

Serial No. 56761

Size .5"

Frequency 2.25 MHz

Mode SHEAR

Nom. Angle 45 °

Measured Angle 45 °

Cable Type (2) RG-58A/U

Cable Length 6'

Remarks: WEDGE # ABWS-1059

N/A

CALIBRATION BLOCK

No. CPL-64

"T" 12.0" Dia. N/A

Temperature 78 ° F

Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. ✓

Metal Path N/A Depth ✓

Each Major Screen Div. = 1"

Remarks N/A

VERTICAL LINEARITY

AMPLITUDE % FSH

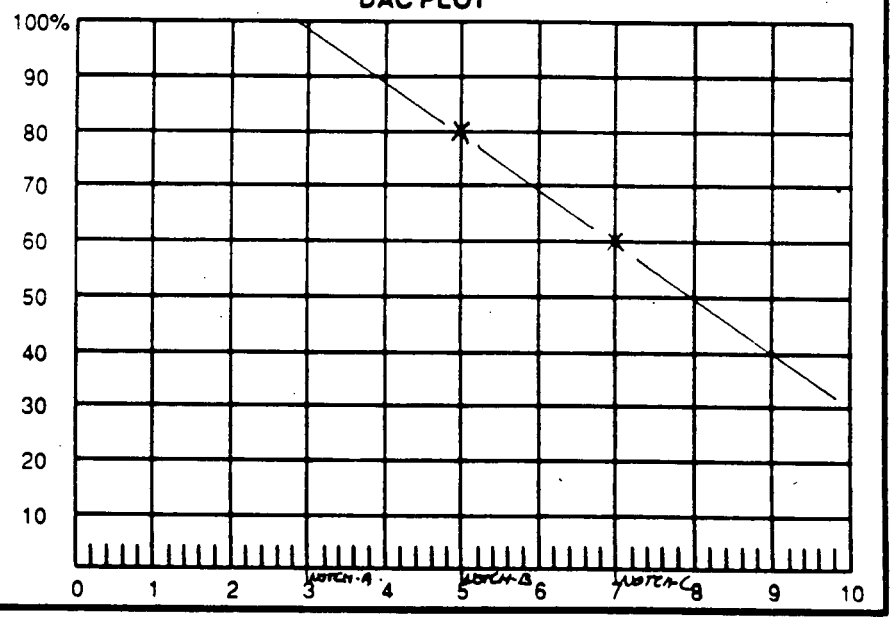
	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

COUPLANT

Brand ULTRAGEL II

Batch No. 093051

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	78

CAL. CHECKS	TIME
INITIAL CAL.	1215
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1818

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/1/93

2 [signature] LEVEL II DATE 10/1/93

REVIEWERS 1 [signature] LEVEL III DATE 10-4-93

2 [signature] LEVEL N/A DATE 10/7/93

3 [signature] LEVEL N/A DATE 10/7/93

DATA SHEET NO. 1228-001
PAGE 3 OF 3

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM #7 S.E. / MS.
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 83 ° F

EXAM ITEM
CPL-205 #7 I.R. C.W. SCAN
C.C.W. SCAN

SCAN 45 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: C.W. INNER RADIUS EXAM COMPLETE.

SCAN 45 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: C.C.W. INNER RADIUS EXAM COMPLETE.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 [signature] LEVEL III DATE 10/1/93
2 [signature] LEVEL II DATE 10/1/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AUII DATE 10/7/93

DATA SHEET NO. 1222-005
PAGE 1 OF 9 SHEETS
CPL-205 REV.0 / Weld No. 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 4.59 Delay 7.86
Range 2.5
Gain (coarse) 0 dB
Gain (fine) 28 dB
Reference Sensitivity 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. G09014
Size 1"
Frequency 2.25 MHz
Mode Ø Longitudinal
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG58A/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 79 °F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X] 0.4
Each Major Screen Div. = ~~0.438~~ 3 10.4
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	11
5	60	30	10	10	6

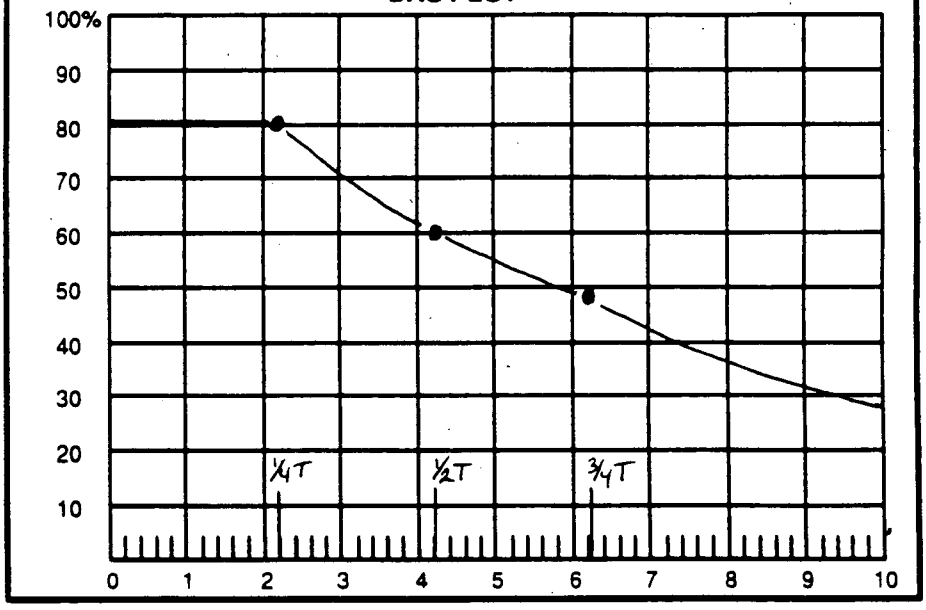
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	77
20	+12	77

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1355
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1825

DAC PLOT



REMARKS: N/A

EXAMINERS
1 Chris D. Judd / C. D. Judd LEVEL II DATE 9-29-93
2 Virginia Sachs LEVEL II DATE 9-29-93

REVIEWERS
1 [signature] LEVEL III DATE 10/4/93
2 [signature] LEVEL N/A DATE 10/9/93
3 R. C. Valladares LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-005
PAGE 2 OF 9 8 SL 10-4-93
CPL-205 REV.0, Weld #8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 2.70 Delay 7.56
Range 10"
Gain (coarse) 0 dB
Gain (fine) 30 dB
Reference Sensitivity 30 dB
Remarks: N A

SEARCH UNIT

Serial No. G10188
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG58A/U
Cable Length 6'
Remarks: Exit Point .70" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .75
Remarks N A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	21
3	80	40	8	30	16
4	70	35	9	20	11
5	60	30	10	10	6

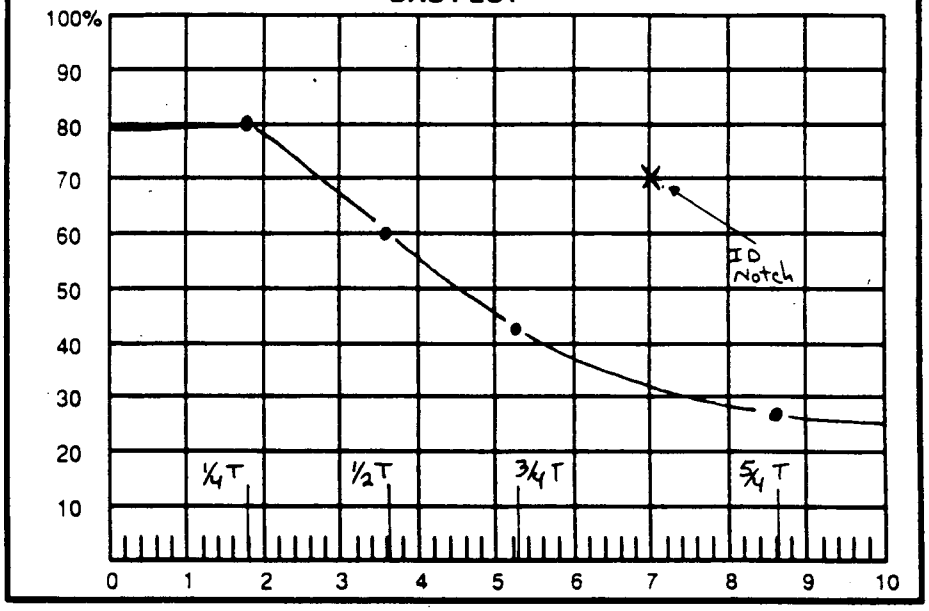
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0840
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1420

DAC PLOT



REMARKS: N A

EXAMINERS	1 Chris O. Judd / C. P. Judd	LEVEL II	DATE 9-30-93
	2 [illegible]	LEVEL II	DATE 9-30-93
REVIEWERS	1 [illegible]	LEVEL III	DATE 10/4/93
	2 [illegible]	LEVEL N/A	DATE 10/4/93
	3 [illegible]	LEVEL AN II	DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-005
PAGE 3 OF ~~8~~ SL-10-443
CPL-205 REV. 0, Weld #8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1222
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 9.55 Delay 7.18
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks:

SEARCH UNIT

Serial No. C09104
Size .5" x 1.0"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG58A/U
Cable Length 6'
Remarks: Exit Point To Tip of Wedge is .75"
N/A

CALIBRATION BLOCK

No. CPL-50A
"T" 3.504 Dia. N/A
Temperature 72 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = 1.0
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

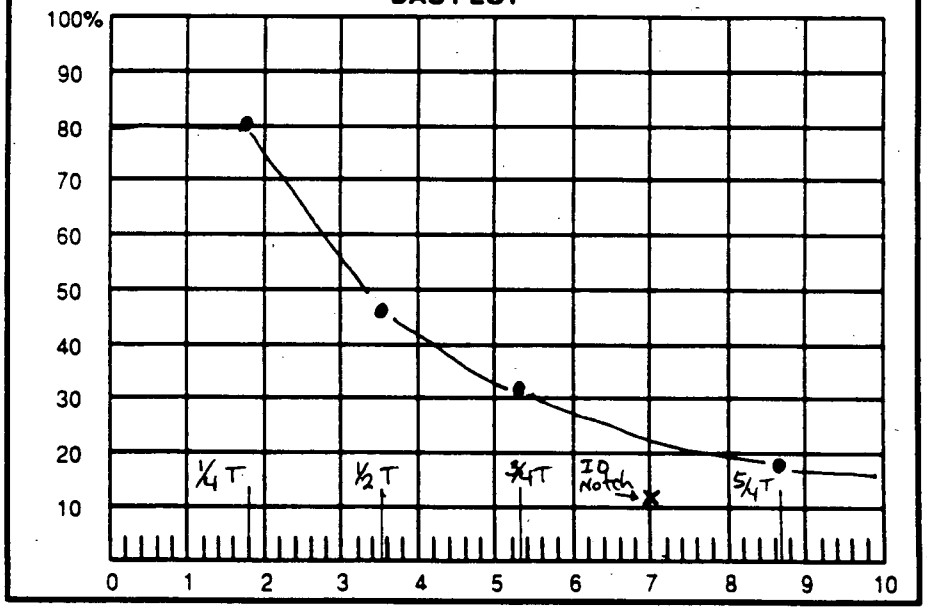
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	75

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1600
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1925

REMARKS: N/A

EXAMINERS 1 Chris D. Judd / CD Judd LEVEL II DATE 9-30-93
2 Benjamin Sage LEVEL II DATE 9-30-93

REVIEWERS 1 [signature] LEVEL III DATE 10/4/93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1222-005
PAGE 4 OF 9 SH 10-8-93

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Stm. Gen. A
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 86 ° F

EXAM ITEM

Weld No. 8

SCAN 0 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Chris D. Judd/Chris D. Judd LEVEL II DATE 9-29-93
2 Benjamin Sanders LEVEL II DATE 9-29-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/4/93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/11/93

DATA SHEET NO. 1229 005
PAGE 5 OF 9 Sheets 10-4-93

EXAM ITEM

Weld No. 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM STM. GEN. A
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 86 ° F

SCAN 44 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: See attached drawing for scan obstructions
Scan on one side of weld only, vessel side
N
A

SCAN 44 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, vessel side
N
A

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: See attached drawing for scan obstructions
Scan on one side of weld only, vessel side.
N
A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, vessel side
N
A

EXAMINERS:
1 Chris D. Judd/Chr Judd LEVEL II DATE 9-30-93
2 Benjamin Sandin LEVEL II DATE 9-30-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/4/93
2 [signature] LEVEL N/A DATE 10/4/93
3 [signature] LEVEL AWII DATE 10/11/93

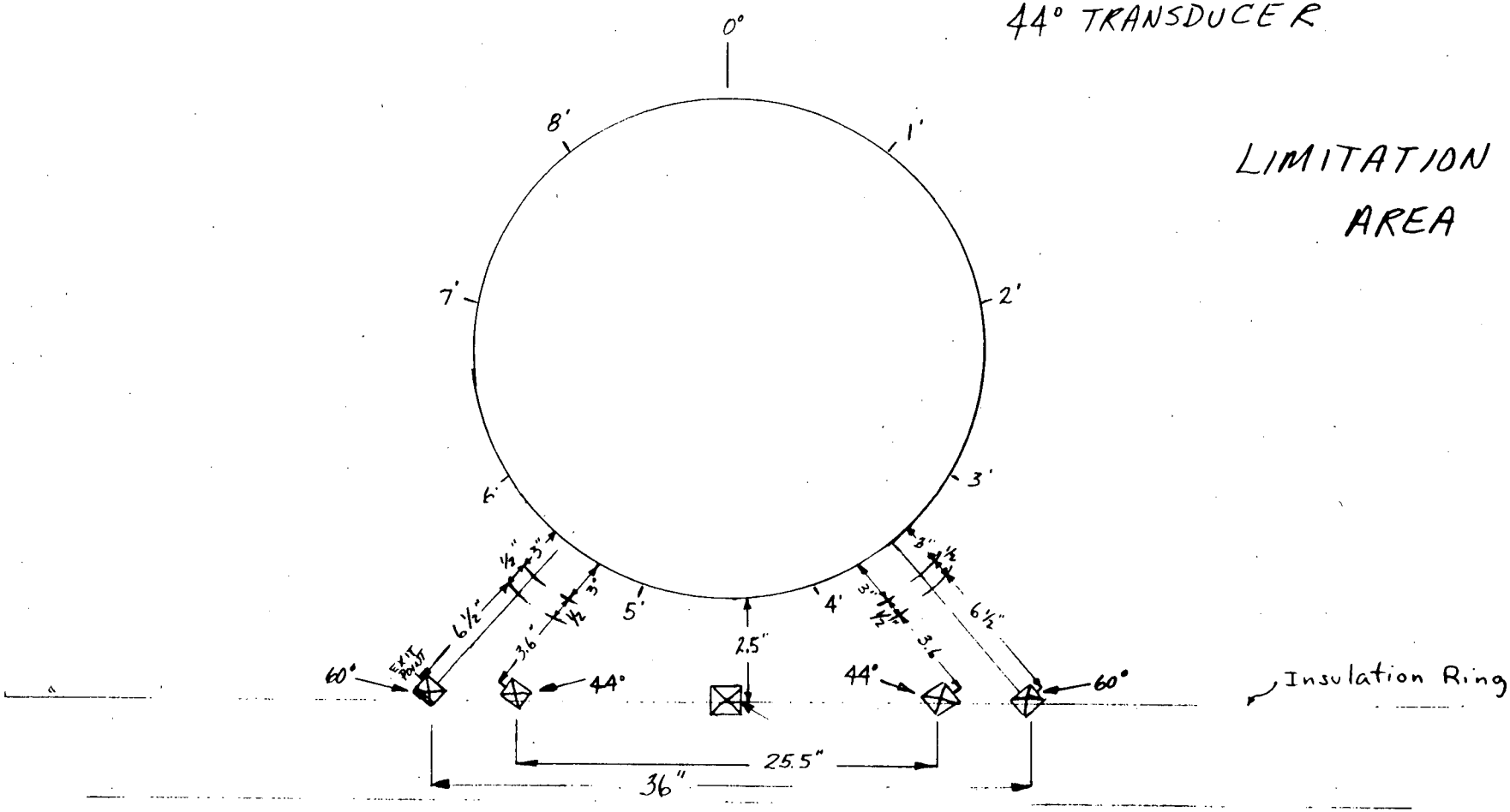
1229-005
6 of 8

STM. GEN. A
CPL-205 REV. 0
Weld No. 8

60° TRANSDUCER

44° TRANSDUCER

LIMITATION AREA



Examiner: Chris Todd/Chris Todd Level: II Date: 9-30-93

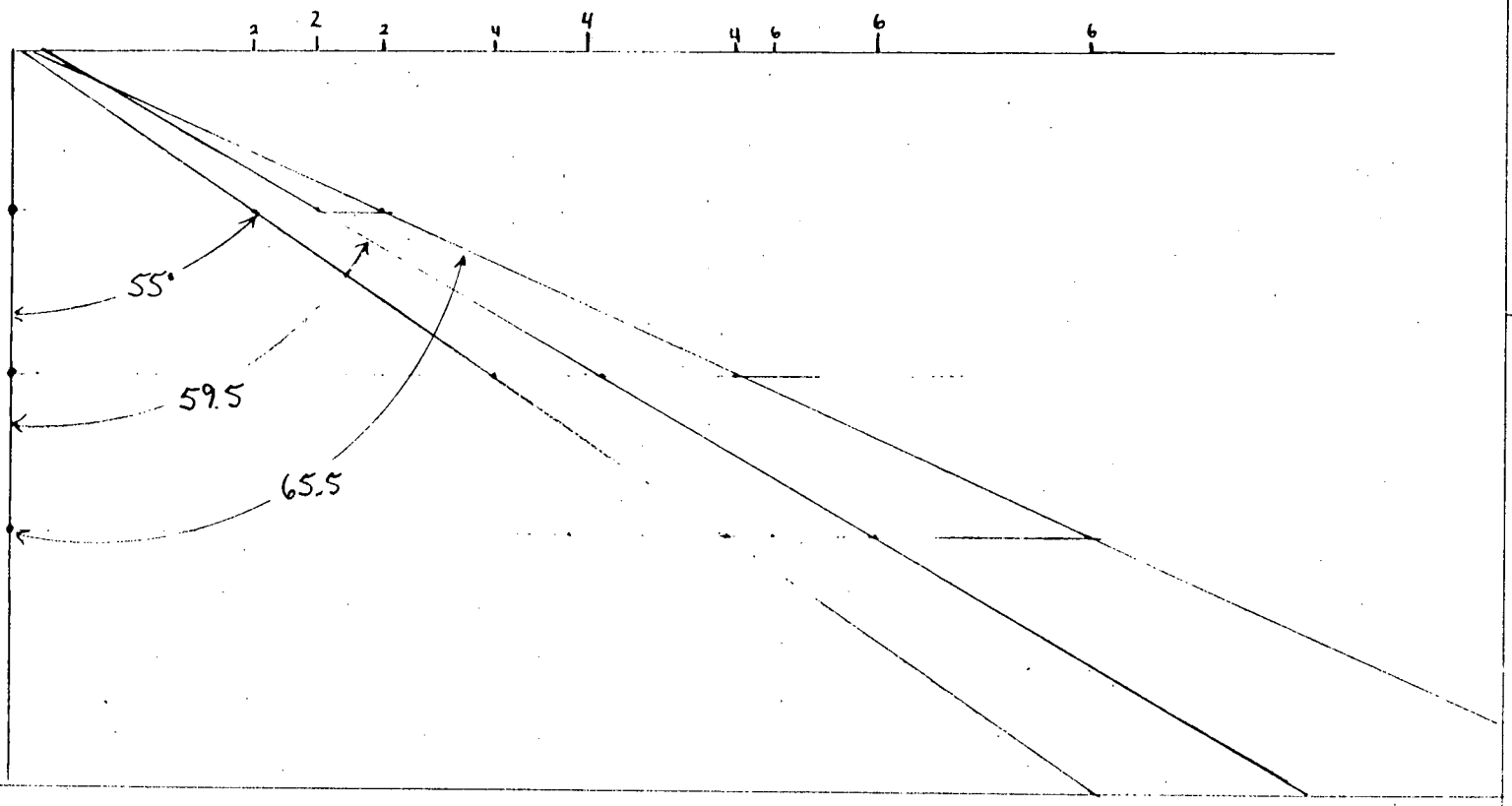
Examiner: [signature] Level: II Date: 9-30-93

Reviewed [signature] LIII 10/4/93

1229-005
7 of 8

59.5 (60°)

KB-Aerotech Gamma
2.25 MHZ
.5 x 1.0
S/N C09104

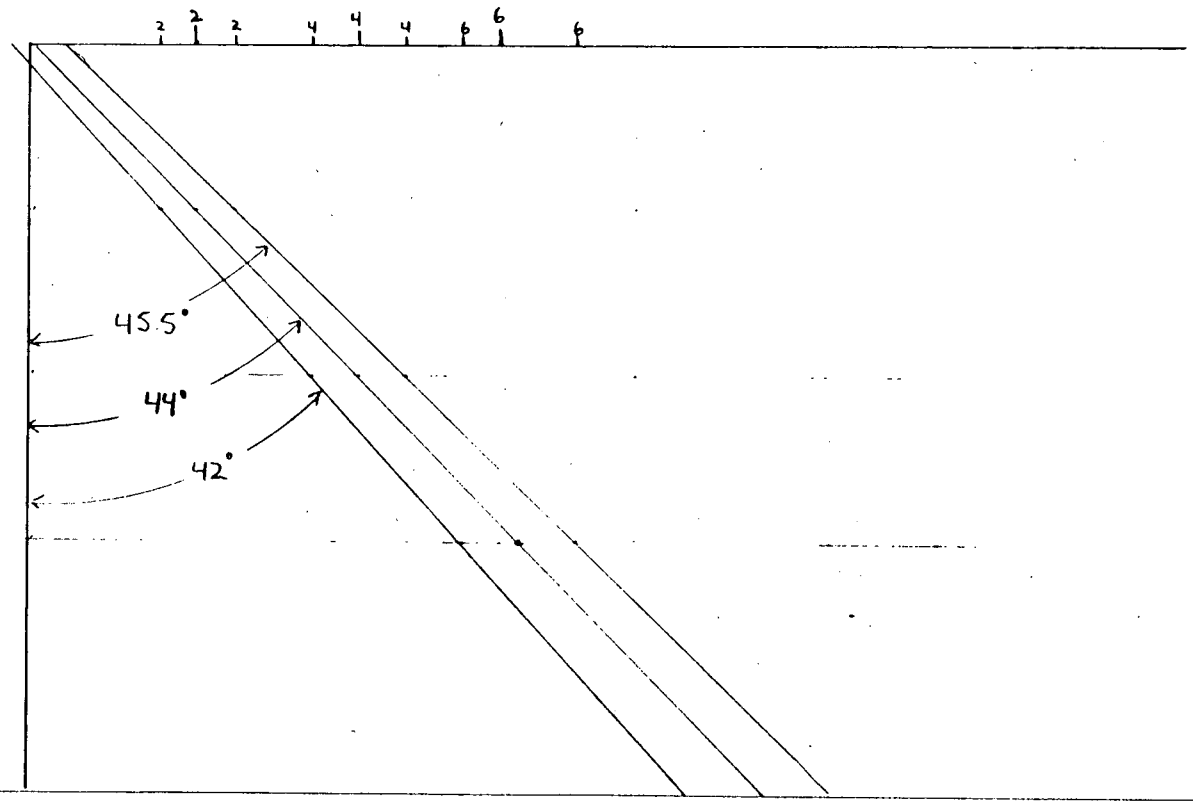


Examiner: Cl D. Judd
Level: II
Date: 9-30-93

1229-005
8 of 8

46° (45°)

KB-Aerotech Gamma
2.25 MHZ
.5 x 1.0
S/N G10188



Examiner: CA D. Fudd
Level: II
Date: 9-30-93

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PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1229
REV. 0
CHANGE NO. N/A

CPL-205 #8 I.R. C.C.W SCAN

INSTRUMENT

Model USK-7
Serial No. 37276-749
Sweep Length 9.52 Delay 3.74
Range 2.5
Gain (coarse) 40 ccw / 40 cw dB
Gain (fine) 20 ccw / 24 cw dB
Reference Sensitivity 60cw / 64cw dB
Remarks: N/A

SEARCH UNIT

Serial No. 56761
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type (2) RG-58A/U
Cable Length 6'
Remarks: WEDGE #ABWS-1061
N/A

CALIBRATION BLOCK

No. CPL-63
"T" 11.5" Dia. N/A
Temperature 78 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. ✓
Metal Path N/A Depth ✓
Each Major Screen Div. = 1.30"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 083051

VERTICAL LINEARITY

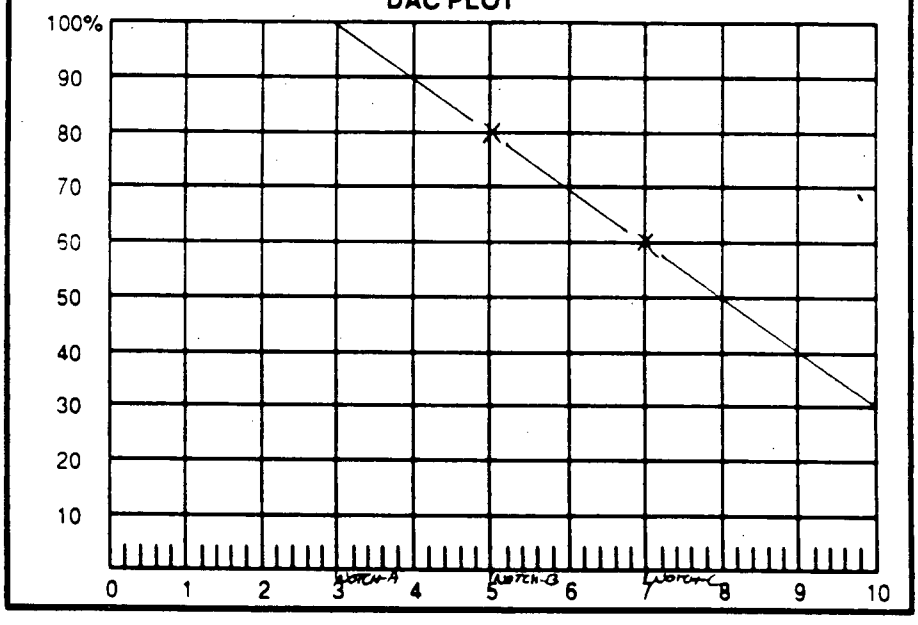
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1105
INTERMEDIATE	1300
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1500

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/1/93
2 [signature] LEVEL II DATE 10/1/93
REVIEWERS 1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AWS DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1229-001
PAGE 2 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1229
REV. 0
CHANGE NO. N/A

CPL-205 #8 I.R. C.W. SCAN

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 9.52 Delay 3.74
Range 2.5
Gain (coarse) -40 ccw / -40 cw dB
Gain (fine) -20 ccw / -24 cw dB
Reference Sensitivity -60 ccw / -64 cw dB
Remarks: N/A

SEARCH UNIT

Serial No. 56760
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type (2) RG-58A/U
Cable Length 6'
Remarks: WEDGE # ABWS-1062
N/A

CALIBRATION BLOCK

No. CPL-63
"T" 11.5" Dia. N/A
Temperature 78 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. ✓
Metal Path N/A Depth ✓
Each Major Screen Div. = 1.30"
Remarks: N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 083051

VERTICAL LINEARITY

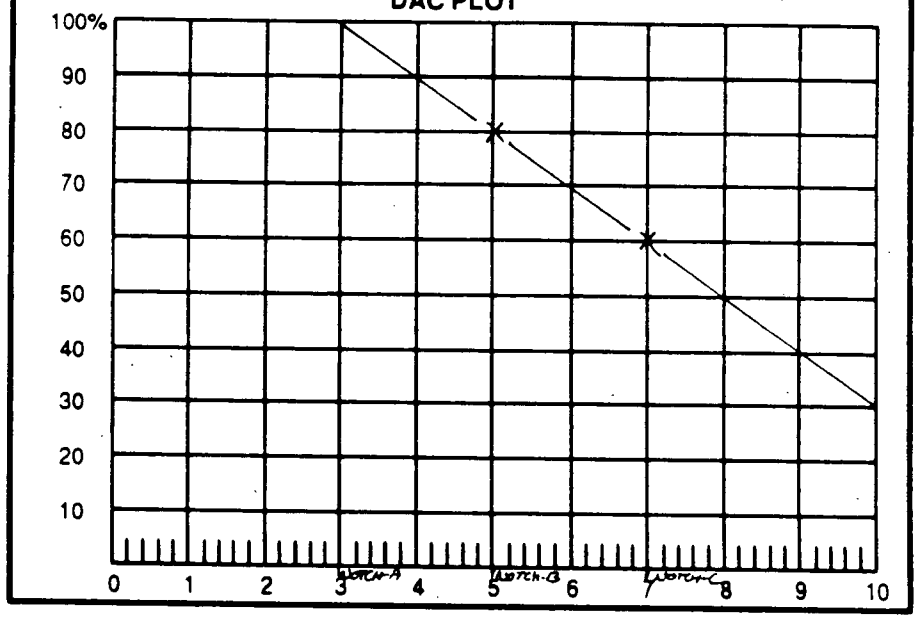
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1105
INTERMEDIATE	1300
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1500

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/1/93
2 [signature] LEVEL II DATE 10/1/93

REVIEWERS 1 [signature] LEVEL III DATE 10-4-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1229-001
PAGE 3 OF 3

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM #8 I.R. / F.W
ISO/DWG. NO. CPL-205 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 83 ° F

EXAM ITEM
CPL-205 #8 I.R. C.C.W. SCAN
C.W. SCAN

SCAN 45 ° SCAN dB 70				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: C.W. INNER RADIUS EXAM COMPLETE. NON VALID GEOMETRIC INDICATIONS NOTED AT APPX. 40 O'CLOCK AND 80 O'CLOCK POSITIONS DUE TO SUPPORT ASSEMBLY.

SCAN 45 ° SCAN dB 66				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: C.C.W. INNER RADIUS EXAM COMPLETE. NON VALID GEOMETRIC INDICATIONS NOTED AT APPX. 40 O'CLOCK AND 80 O'CLOCK POSITIONS DUE TO SUPPORT ASSEMBLY.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

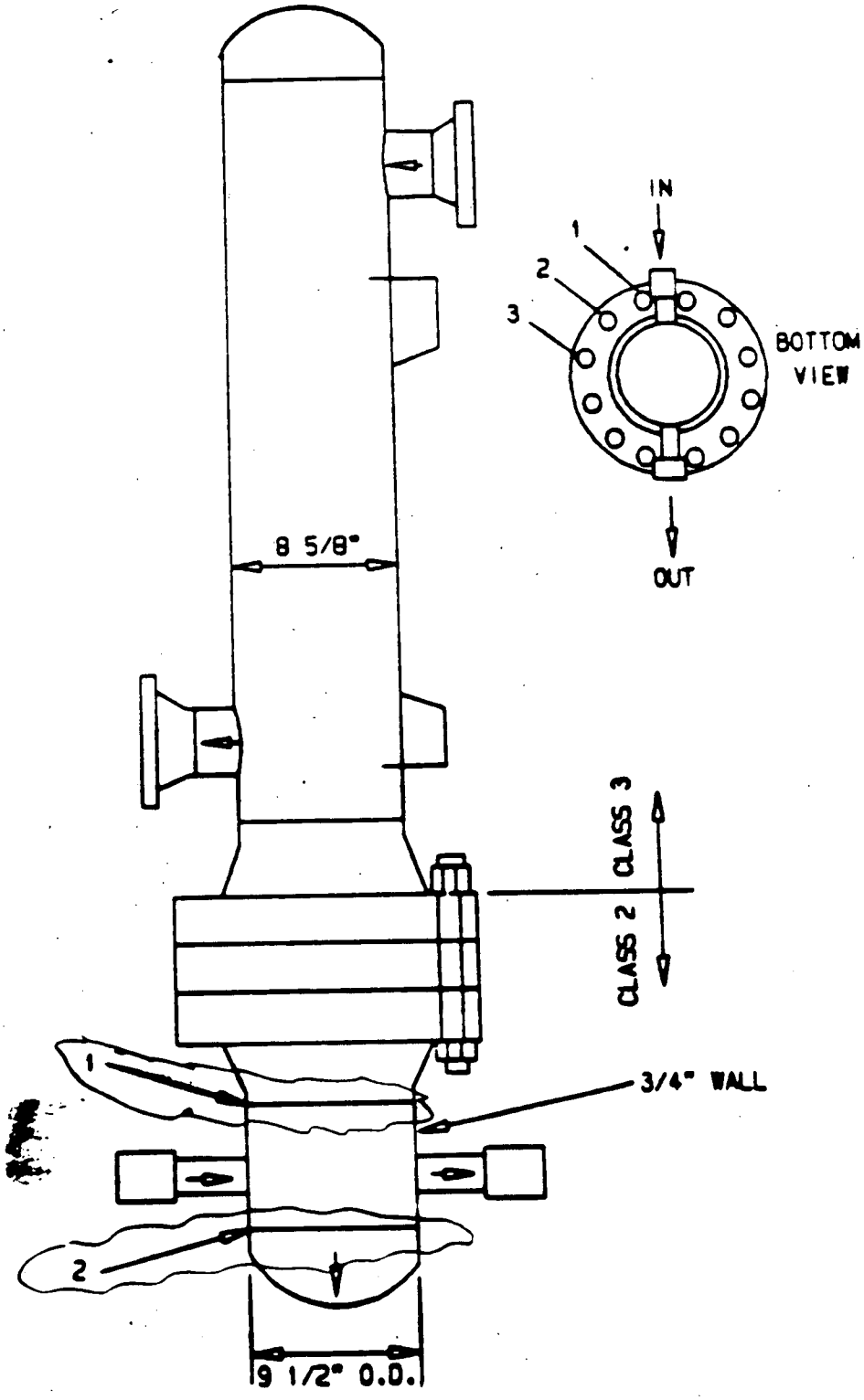
REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 [signature] LEVEL III DATE 10/1/93
2 David W Martin LEVEL II DATE 10/1/93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-4-93
2 Richard A Weber LEVEL N/A DATE 10/7/93
3 R Balladares LEVEL AN II DATE 10/7/93



Cl.10
Weld 1
UT 33% (1) 1½hr

Cl.10
Weld 2
UT 33% (1) 1½hr

CPL-207 REV.0

H.B. ROBINSON S.E. PLANT
UNIT NO. 2
DESCRIPTION: EXCESS LETDOWN HEAT EX
LINE NO. CPL- 207 RE

CPL 207 Weld 1 and 2

An ultrasonic comparison of CPL-31, 10" Sch 120, SA 312 304 and the Ex Lct. Heat Exchanger constructed of SA 240 316 material was performed in order to establish the UT compatibility between the two items.

Using a full vee path with a nominal 45° shear wave transducer transmitted to another 45° transducer in a pitch-catch mode, the received signal in CPL-31 was compared to the received signal in the component material. The amplitude of both signals was 80% FSH at same dB setting. Beam angle was determined to be 43° in both the cal. block and the component.

CPL-31 should be considered ultrasonically compatible to the component.

Scott Lawson LIII

10-9-93

DATA SHEET NO. ~~122~~ 1219-001
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1219
REV. 0
CHANGE NO. N/A

CPL-207 WELD #1

INSTRUMENT

Model USM-7
Serial No. 1499
Sweep Length 5.47 Delay 9.05
Range .5"
Gain (coarse) 40 dB
Gain (fine) 10 dB
Reference Sensitivity 50 dB
Remarks:

SEARCH UNIT

Serial No. KB11403
Size .375"
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks:

CALIBRATION BLOCK

No. CPL-31
"T" .870" Dia. 10"
Temperature 72 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = 1.02"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

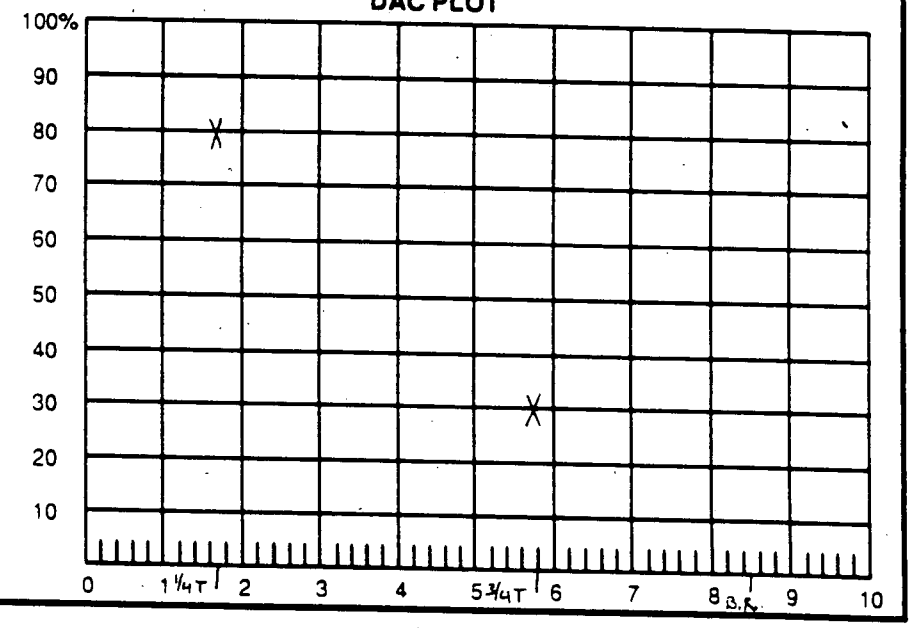
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1305
INTERMEDIATE	\
INTERMEDIATE	N/A
INTERMEDIATE	\
FINAL CAL.	1545

DAC PLOT



REMARKS:

EXAMINERS 1 Scott Lamm LEVEL III DATE 10-9-93
2 David M Martin LEVEL II DATE 10/9/93
REVIEWERS 1 Richard A. Weber LEVEL N/A DATE 10/12/93
2 W Balladares LEVEL A/N II DATE 10/13/93
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 12,9 - 001
PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1219
REV. 0
CHANGE NO. N/A

CPL-207 WELD #1

INSTRUMENT

Model USL-48
Serial No. 213220-4
Sweep Length 8.58 Delay 7.32
Range 2.5
Gain (coarse) +20 / = 20 dB
Gain (fine) +26 / = 34 dB
Reference Sensitivity +46 / = 54 dB
Remarks: _____

SEARCH UNIT

Serial No. 15233
Size .375"
Frequency 1.5 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 43 °
Cable Type RG-174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-31
"T" .870" Dia. 10"
Temperature 72 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .25"
Remarks _____

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

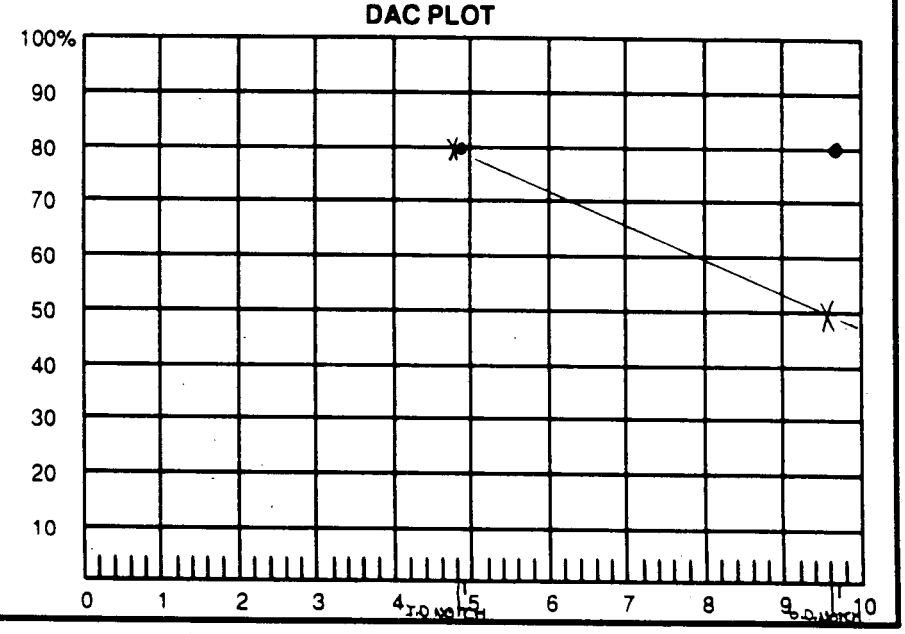
	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	48
80	-12	22
40	+6	76
20	+12	70

CAL. CHECKS	TIME
INITIAL CAL.	1300
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1540

DAC PLOT



REMARKS: X = AXIAL SCAN I.D. O.D. NOTCHES
• = CIRC. SCAN I.D. O.D. NOTCHES

EXAMINERS	1	Scott Lam	LEVEL	III	DATE 10/9/93
	2	David G Martin	LEVEL	II	DATE 10/9/93
REVIEWERS	1	Richard B. Weber	LEVEL	N/A	DATE 10/12/93
	2	A Valladares	LEVEL	AN II	DATE 10/13/93
	3	_____	LEVEL	_____	DATE _____

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1219-001
PAGE ____ OF ____
EXAM ITEM
CPL-207 WELD #1

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM ~~WELD #1~~ / LGL. HX
ISO/DWG. NO. CPL-207 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 76 ° F

SCAN 0 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SHELL TO FLANGE. COMPLETE BOTH SIDES. EXAMINED 12" FROM L-0" TO L-12".

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SHELL TO FLANGE. COMPLETE BOTH SIDES. EXAMINED 12" FROM L-0" TO L-12".

SCAN 45 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SHELL TO FLANGE. COMPLETE BOTH SIDES. EXAMINED 12" FROM L-0 TO L-12"

SCAN ~~____~~ ° SCAN dB ~~____~~				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

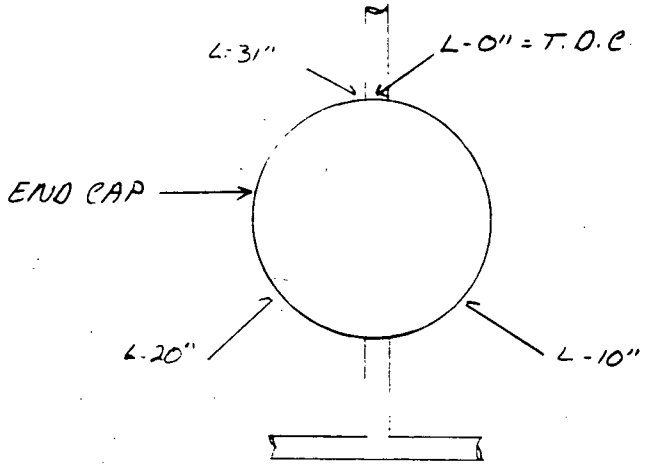
REMARKS: ~~N/A~~

EXAMINERS:
1 Scott Lam LEVEL ~~III~~ DATE 10~~9~~9/93
2 David M Monts LEVEL II DATE 10/9/93

SL 10-9-93
REVIEWERS:
1 Richard B. Weber LEVEL N/A DATE 10/12/93
2 R P Wallace LEVEL ANII DATE 10/13/93
3 _____ LEVEL _____ DATE _____

1219-001

CPL-207, EXCESS LET DOWN HEAT EXCHANGER
WELDS #1 & 2



VIEW LOOKING EAST

Examined from 0° to 12" CW

David M Martin LEVEL II 10/9/93

CPL 207 Weld 1 and 2

An ultrasonic comparison of CPL-31, 10" Sch 120, SA 312 304 and the Ex Let Heat Exchanger constructed of SA 240 316 material was performed in order to establish the ut compatibility between the two items.

Using a full vee path with a nominal 45° shear wave transducer transmitted to another 45° transducer in a pitch-catch mode, the received signal in CPL-31 was compared to the received signal in the component material. The amplitude of both signals was 80% FSH at same dB setting. Beam angle was determined to be 45° in both the cal. block and the component.

CPL-31 should be considered ultrasonically compatible to the component.

Scott Lawson III

10-9-93

DATA SHEET NO. 1219-002
PAGE 1 OF 4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1219
REV. 0
CHANGE NO. N/A

CPL-207 WELD #2

INSTRUMENT

Model USK-7
Serial No. 1499
Sweep Length 5.47 Delay 9.05
Range .5"
Gain (coarse) 40 dB
Gain (fine) 10 dB
Reference Sensitivity 50 dB
Remarks:

SEARCH UNIT

Serial No. KB11403
Size .375"
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks:

CALIBRATION BLOCK

No. CPL-31
"T" .870" Dia. 10"
Temperature 72 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = 1.02"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

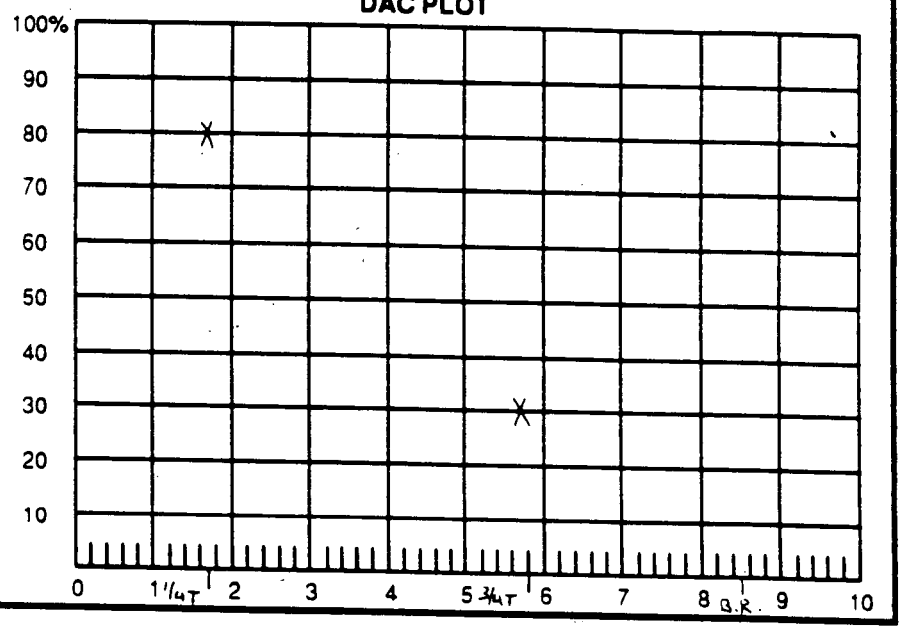
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1305
INTERMEDIATE	\
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1545

DAC PLOT



REMARKS:

EXAMINERS 1 Scott Lamm LEVEL III DATE 10/9/93
2 David G Martin LEVEL II DATE 10/9/93

REVIEWERS 1 Richard B. Weber LEVEL N/A DATE 10/12/93
2 R Valladares LEVEL AUT II DATE 10/13/93
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1219-002
PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1219
REV. 0
CHANGE NO. N/A

CPL-207 WELD # 2

INSTRUMENT

Model USL-48
Serial No. 213220-4
Sweep Length 8.58 Delay 7.32
Range 2.5
Gain (coarse) +20 / =20 dB
Gain (fine) +26 / =34 dB
Reference Sensitivity +46/=54 dB
Remarks:

SEARCH UNIT

Serial No. 15233
Size .375"
Frequency 1.5 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 43 °
Cable Type 26/174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-31
"T" .870" Dia. 10"
Temperature 72 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .25"
Remarks

COUPLANT

Brand ULTRAGEL II
Batch No. 092031

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

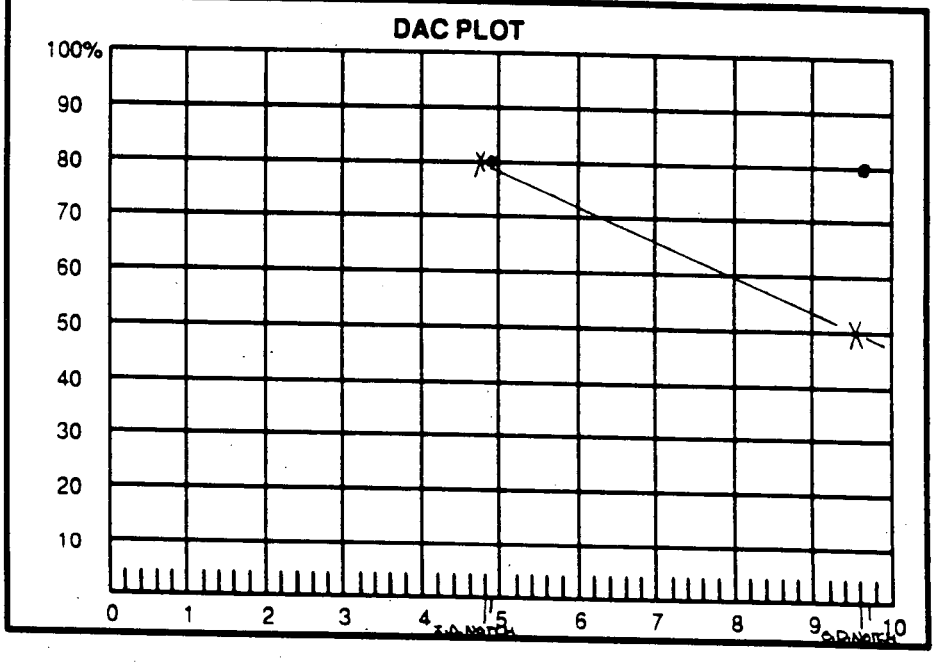
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	76
20	+12	70

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1300
INTERMEDIATE	\
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1540

DAC PLOT



REMARKS: X = AXIAL SCAN I.D. O.D. NOTCHES
• = CIRC SCAN I.D. O.D. NOTCHES

EXAMINERS 1 Scott Lum LEVEL III DATE 10/9/93
2 David Mantz LEVEL II DATE 10/9/93
REVIEWERS 1 Richard B. Wilcox LEVEL N/A DATE 10/12/93
2 R Wallace LEVEL ANII DATE 10/13/93
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1219-002
PAGE _____ OF _____
EXAM ITEM
CPL-207 WELD #2

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #2/EL-HX
ISO/DWG. NO. CPL-207 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 76 ° F

SCAN 0 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: END CAP TO SHELL. COMPLETE BOTH SIDES. EXAMINED 12" FROM L-0" TO L-12".

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: END CAP TO SHELL. COMPLETE BOTH SIDES. EXAMINED 12" FROM L-0" TO L-12"

SCAN 45 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: END CAP TO SHELL - COMPLETE BOTH SIDES. EXAMINED 12" FROM L-0" TO L-12"

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

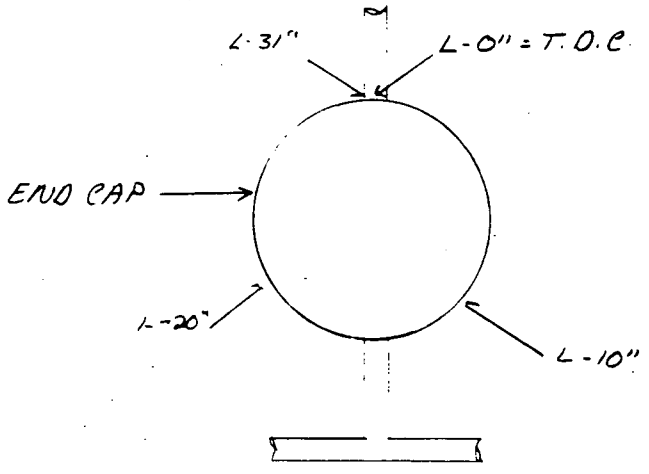
REMARKS: N/A

EXAMINERS:
1 Scott Lum LEVEL III DATE 10/9/93
2 David M Martin LEVEL II DATE 10/9/93

REVIEWERS:
1 Richard B Weber LEVEL N/A DATE 10/12/93
2 R Wallace Jones LEVEL ANII DATE 10/13/93
3 _____ LEVEL _____ DATE _____

1219-002

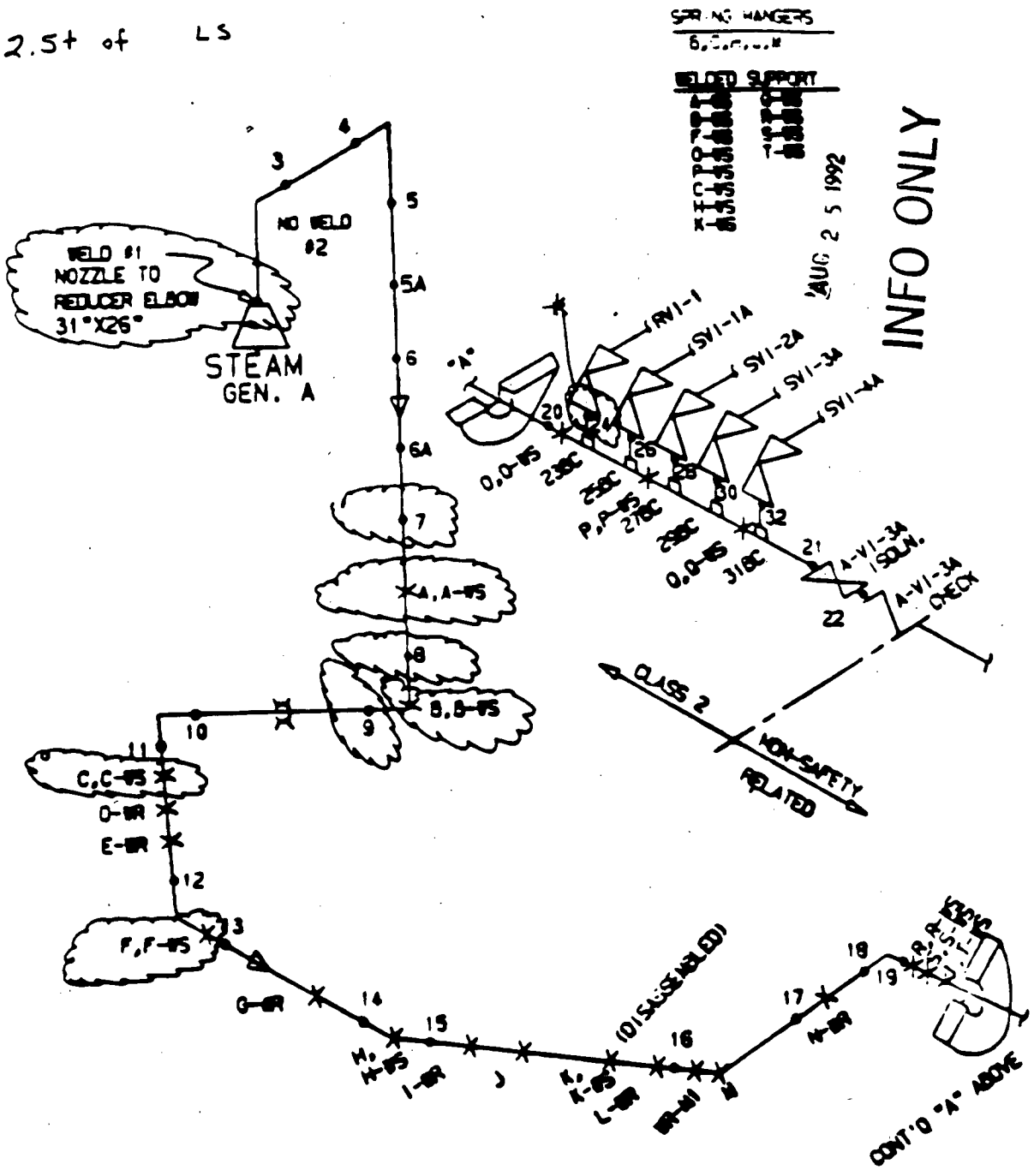
CPL-207 EXCESS LETDOWN HEAT EXCHANGER
WELDS # 1 & 2



VIEW LOOKING EAST

David M Martin LEVEL II 10/9/93

+ 2.5t of LS



CP & L Dwg. No. HBRP-10618 SH. 71					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	HLL	PLD	CLD	12/12/91

CPL-212 REV.0

H.B. ROBINSON S.E. PLANT	CP & L
UNIT NO. 2	
DESCRIPTION: LOOP A 26" MAIN STEAM	
LINE NO. 26"-MS-A	CPL-212 REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-090
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: MAIN STEAM	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-212		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Wilson 10/11/93

QA NSES 5.11, Rev 0, 07/93

ANII A Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-103
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: MS	Component Name: Variable Support	Component ID: 212-B
Drawing/Location: CPL-212RO / Rx. Bldg. - under floating 3rd Floor		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R P Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-052
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: MS	Component Name: VARIABLE Support	Component ID: 212C
Drawing/Location: CPL212 R/O / Ex. Bldg. - 251 - 8"		
☒ VT-3 Procedure: SP-1230 Rev. C	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 5130 lbs. And 5130 lbs.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard O. Weber Date: 10/7/93

ANII R Valladares 10/7/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-066
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: MS	Component Name: Support/Hanger	Component ID: 212F
Drawing/Location: CPL-212 R/C / Rx. Bldg. 251'-8"		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] 10/11/93

CANDE ISI 11, Rev. 0, 3/16

ANII [signature] 10/11/93

DATA SHEET NO. 1218-005
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 1.042 INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED MAIN STEAM UNIT 2 ISO/DWG/SK. # CPL-212 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 831067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER RESEARCH
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS N/A
Pole Spacing 6 INCHES
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "1"	NO INDICATIONS NOTED	X	N/A
WELD "1LS" (2.5T)	NO INDICATIONS NOTED	X	
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 9/29/93
EXAMINER Steve Wolfum LEVEL II DATE 9-29-93
REVIEWER [signature] LEVEL III DATE 9-30-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER [signature illegible] DATE 10/5/93

DATA SHEET NO. 1218-002
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 1.042 INCHES
MATERIAL C/S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED LOOP "A" 26" MAIN STEAM ISO/DWG/SK. # CPL-212 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 832067
Color RED

EQUIPMENT
Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 7	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wallum LEVEL II DATE 9-28-93
EXAMINER Tom Oakes LEVEL II DATE 9-28-93
REVIEWER Scott Larson LEVEL III DATE 9-29-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER [illegible] DATE 10/5/93

DATA SHEET NO. 1218-002
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 1.042 INCHES
MATERIAL 4S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 2 OF 2

SYSTEM EXAMINED LOOP "A" 26" MAIN STEAM ISO/DWG/SK. # CPL-212 REVISION 0

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 834067
Color RED

EQUIPMENT

Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 7 L.S. 2.5+	NO RECORDABLE INDICATIONS	X	N/A
	2.5+ BOTH SIDES OF CIRC WELD 7		
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-28-93
EXAMINER Tim Oldham LEVEL II DATE 9-28-93
REVIEWER Scott Lamm LEVEL III DATE 9-29-93
REVIEWER Richard Bleiler DATE 9/29/93
REVIEWER ANII R Williadams DATE 10-5-93

DATA SHEET NO. 1218-013
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 1.042 INCHES
MATERIAL C/S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED LOOP A 26" MAIN STEAM ISO/DWG/SK. # CPL-212 REVISION 0

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 832067
Color RED

EQUIPMENT

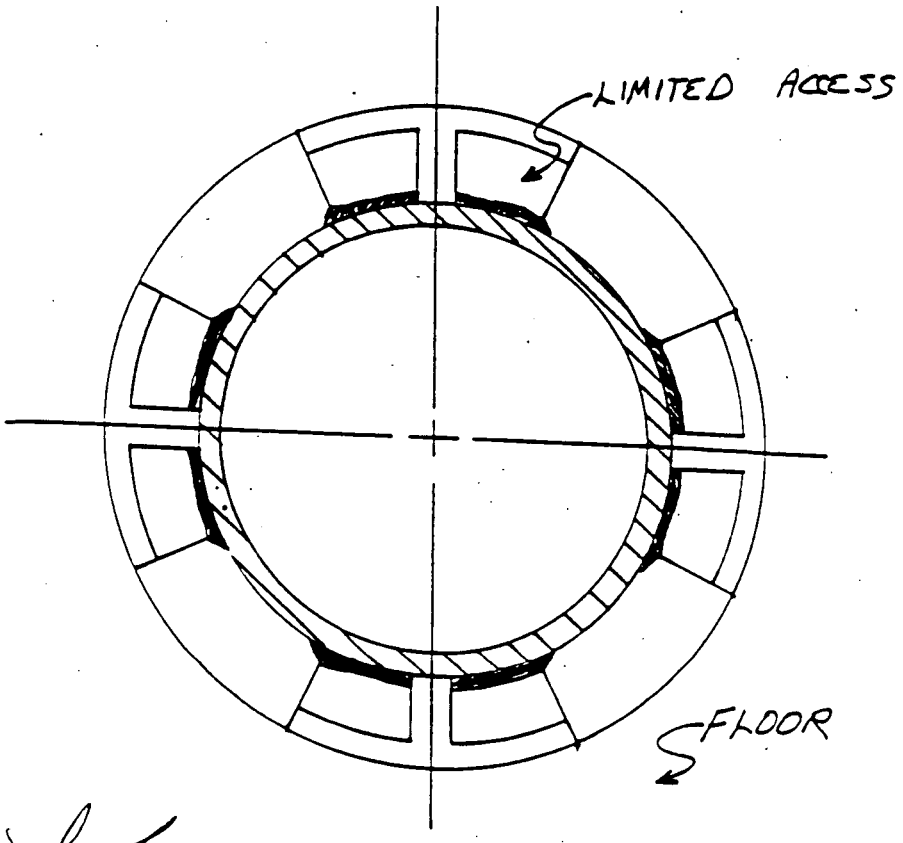
Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 8	NO RECORDABLE INDICATIONS	X	N/A
WELD 9	NO RECORDABLE INDICATIONS	X	N/A
A.A-WS WELDED SUPPORT	LIMITED EXAM DUE TO COMPONENT CONFIGURATION ONE DIRECTION ONLY (SEE ATTACHED SKETCH)	X	N/A
	N		
	A		

EXAMINER Steve Wollan LEVEL II DATE 10-7-93
EXAMINER [signature] LEVEL III DATE 10-7-93
REVIEWER [signature] LEVEL III DATE 10/10/93
REVIEWER Richard O. Weber DATE 10/11/93
REVIEWER ANIL A. Valladares DATE 10/11/93

LIMITED EXAM DUE TO COMPONENT CONFIGURATION.
ONE DIRECTION ONLY.

A-WS



EXAMINER [signature] LEVEL III DATE 10-7-93
EXAMINER Steve Wollum LEVEL II DATE 10-7-93

DATA SHEET NO. 1218-010
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS .906 INCHES
MATERIAL C/S
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED LOOP A 26" MAIN STEAM ISO/DWG/SK. # CPL-212 REVISION 0

DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 89 D040
Color RED

EQUIPMENT

Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 88-012
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 4"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 24	NO RECORDABLE INDICATIONS	X	N/A
	NO LONG SEAM		
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 10-4-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER [signature] DATE 10/5/93

DATA SHEET NO. 1218 015
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED MAIN STEAM ISO/DWG/SK. # CPL-212 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "F-WS"	NO INDICATIONS NOTED	X	N/A
N/A	N/A	N/A	

EXAMINER Kenneth A. Hamm LEVEL II DATE 10-11-93
EXAMINER [signature] LEVEL II DATE 10-11-93
REVIEWER [signature] LEVEL III DATE 10-11-93
REVIEWER Richard D. Weber DATE 10/12/93
REVIEWER [signature] ANII DATE 10/13/93

DATA SHEET NO. 1223-002
PAGE 1 OF 6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

212-1

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 4.90 Delay 8.00
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 2 dB
Reference Sensitivity 22 dB
Remarks: N/A

SEARCH UNIT

Serial No. E 20000
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MOT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-40
"T" 1.203" Dia. 32"
Temperature 73 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

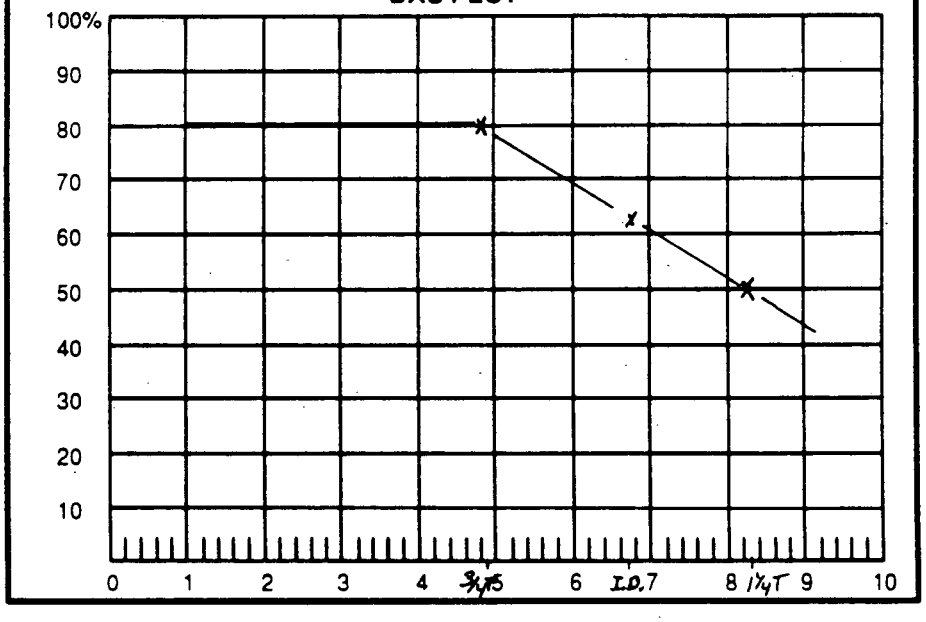
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1330
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1635

REMARKS: -12dB TO BRING I.D. NOTCH TO DAC

EXAMINERS	1	Tim Adams	LEVEL II	DATE	10-1-93
	2	Steve Wollum	LEVEL I	DATE	10-1-93
REVIEWERS	1	Scott Lang	LEVEL III	DATE	10-4-93
	2	David B. Weber	LEVEL N/A	DATE	10/5/93
	3	R.R. Valladares	LEVEL ANII	DATE	10/5/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-012
PAGE 2 OF 6

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

212-1

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 658 Delay 7.50
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 59 °
Cable Type BNC-MOT RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-40
"T" L203 Dia. 32"
Temperature 73 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = .4"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

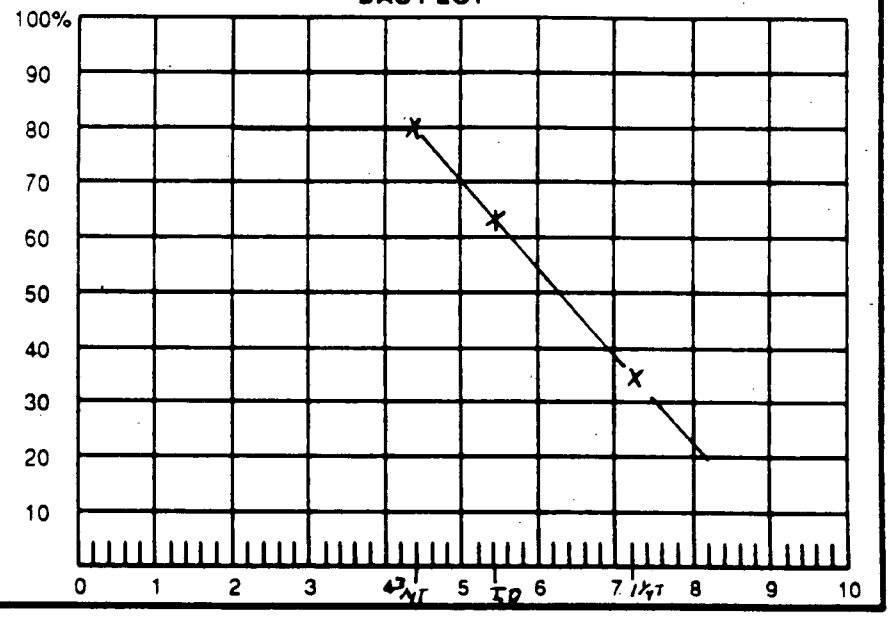
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1340
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1640

REMARKS: -2dB TO BRING I.D. NOTCH TO DAC

EXAMINERS	1	Tim Oldham	LEVEL II	DATE	10-1-93
	2	Steve Wallum	LEVEL I	DATE	10-1-93
REVIEWERS	1	Scott Lane	LEVEL III	DATE	10-4-93
	2	Richard O. Weber	LEVEL N/A	DATE	10/5/93
	3	A Wallace Jones	LEVEL ANII	DATE	10/5/93

DATA SHEET NO. 1223-01 2
PAGE 3 OF 6
EXAM ITEM

WELD 1 + 2.5 + L.S.

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP A 26" MAIN STEAM
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

SCAN 45 ° SCAN dB 28				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	X	N/A	X	N/A

REMARKS: ROOT GEOMETRY SEEN 360° AT VARYING AMPLITUDES

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	X	N/A	X	N/A

REMARKS: COUNTERBORE GEOMETRY SEEN 360° AT VARYING AMPLITUDES

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N A

EXAMINERS:
1 Tim Addison LEVEL II DATE 10-1-93
2 Steve Wollum LEVEL I DATE 10-1-93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-4-93
2 Richard A. Weber LEVEL N/A DATE 10/5/93
3 RB Valladares LEVEL ANII DATE 10/5/93

EXAM ITEM: Weld 1

ISO/DWG. NO.: CPL-212

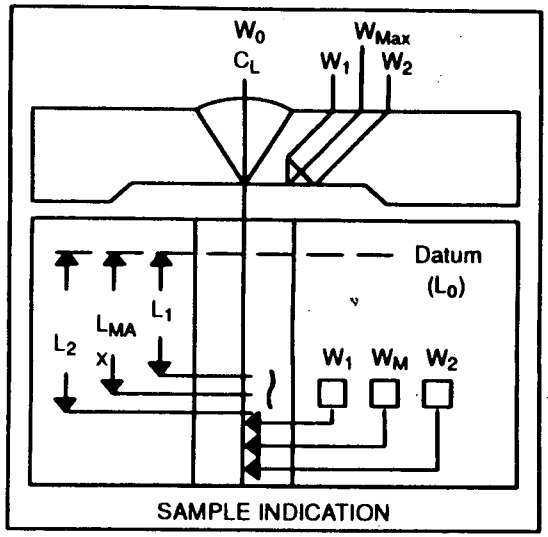
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-012

PAGE 4 OF 6

SEARCH UNIT ANGLE 60 ° W_0 LOCATION Weld ℄ L_0 LOCATION Extrados of Elbow



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	100%	3.2"	7.8	3.0"	7.4	3.3"	8.0	*	4' CCW	*	N/A	US	* Seen 360° at Varying Amplitudes
							N/A						N/A

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Tim Odom LEVEL II DATE 10-1-93

2 Steve Wollum LEVEL I DATE 10-1-93

REVIEWERS 1 Scott Lamm LEVEL III DATE 10-4-93

2 Linda B. Weber LEVEL N/A DATE 10/5/93

3 R Wallace LEVEL ANII DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.

NES 9/90

EXAM ITEM: weld 1

ISO/DWG. NO.: CPL-212

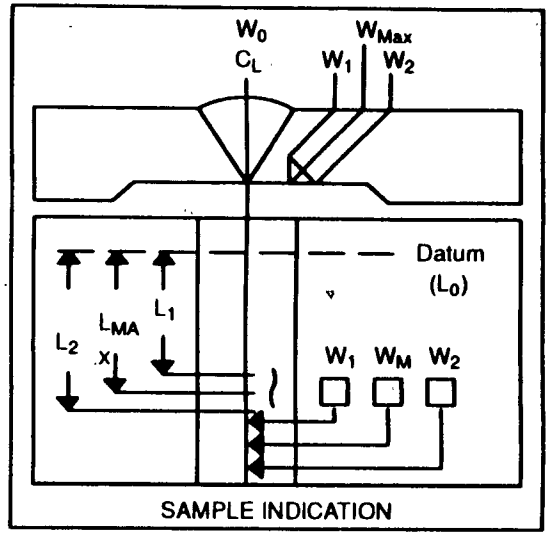
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-012

PAGE 5 OF 6

SEARCH UNIT ANGLE 45 ° W_0 LOCATION Weld ℄ L_0 LOCATION Extrados of Elbow



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	50%	1.4"	7.8	1.2"	7.2	1.6"	8.2	*	4'ccw	*	N/A	DS	* Seen 360° Intermittent at Varying Amplitudes
							N/A						

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Tim Oddom LEVEL II DATE 10-1-93

2 Steve Wollum LEVEL I DATE 10-1-93

REVIEWERS 1 Scott Lamm LEVEL III DATE 10-4-93

2 Richard B. Weber LEVEL N/A DATE 10/5/93

3 A Wheladay LEVEL ANII DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.

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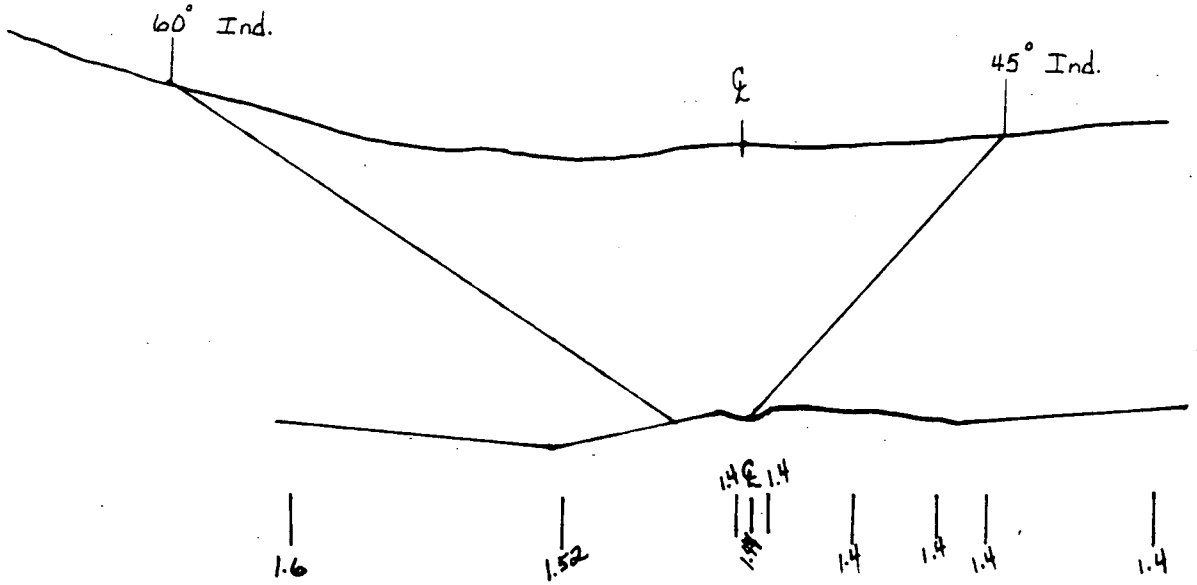
6 of 6

Exam Item: Weld 1
ISO/Dwg. No.: CPL-212



Examiners: Tim Cobbs LV. II

Steve Wollum LV. I

Date: 10-1-93

Reviewed: Scott Lam LIII 10-4-93

DATA SHEET NO. 1223-003
PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-212 WELD #7

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 5.36 Delay 8.42
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity 42 dB
Remarks: N/A

SEARCH UNIT

Serial No. M12411
Size .5"
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG-174
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-212 W#7
"T" 1.1" Dia. 26"
Temperature 82 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

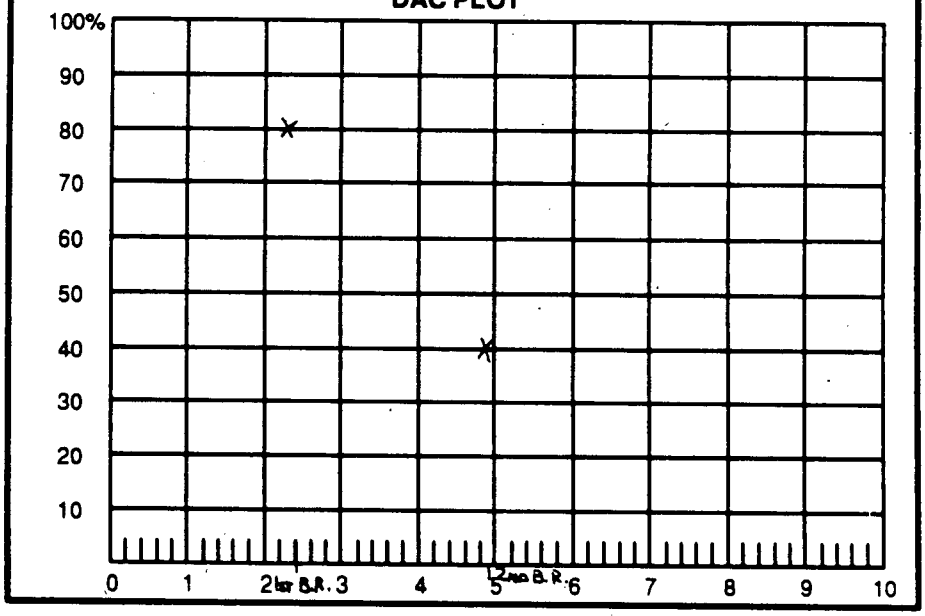
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	38
80	-12	18
40	+6	83
20	+12	83

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1359
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1424

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/28/93
2 David H Mastro LEVEL II DATE 9/28/93

REVIEWERS 1 [signature] LEVEL III DATE 9-29-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL AN II DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-003
PAGE 2 OF 8

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-212 WELD #7

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 8.00 Delay 7.85
Range 2.5"
Gain (coarse) +20 / =20 dB
Gain (fine) +8 / =8 dB
Reference Sensitivity +28 / =28 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-174
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-56
"T" 1.042" Dia. 26"
Temperature 71 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

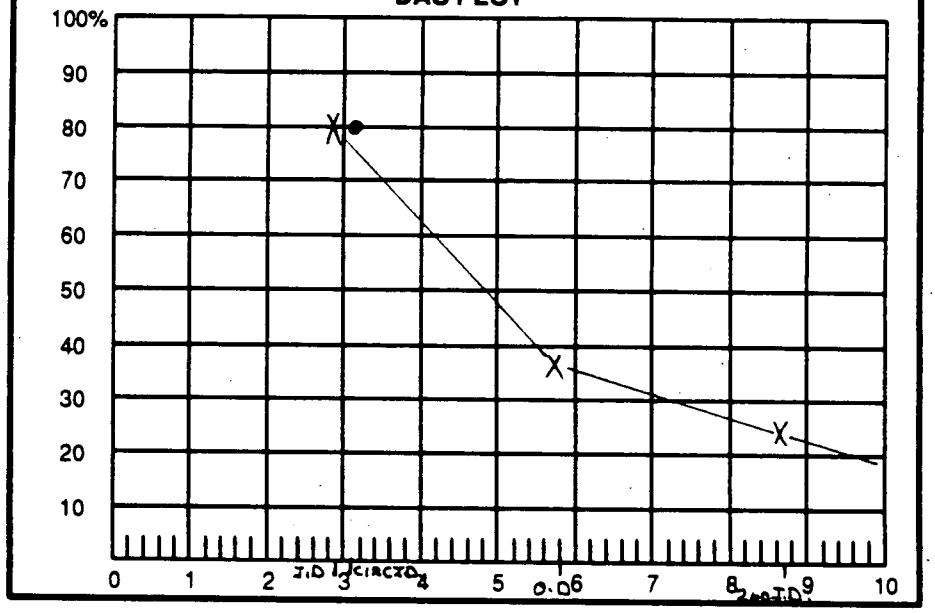
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	19
40	+6	81
20	+12	83

CAL. CHECKS

	TIME
INITIAL CAL.	1325
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1615

DAC PLOT



REMARKS: • = CIRC. SCAN I.D. NOTCH.
X = AXIAL SCAN I.D. NOTCHES, O.D. NOTCH

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/28/93
	2	[signature]	LEVEL	II	DATE 9/28/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 9-29-93
	2	[signature]	LEVEL	N/A	DATE 9/29/93
	3	[signature]	LEVEL	A/II	DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-003
PAGE 3 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-212 WELD #7

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 9.55 Delay 8.06
Range 2.5"
Gain (coarse) 20 / = 20 dB
Gain (fine) 20 / = 18 dB
Reference Sensitivity 40 / = 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-56
"T" 1.042" Dia. 26"
Temperature 71 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = 1.0
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

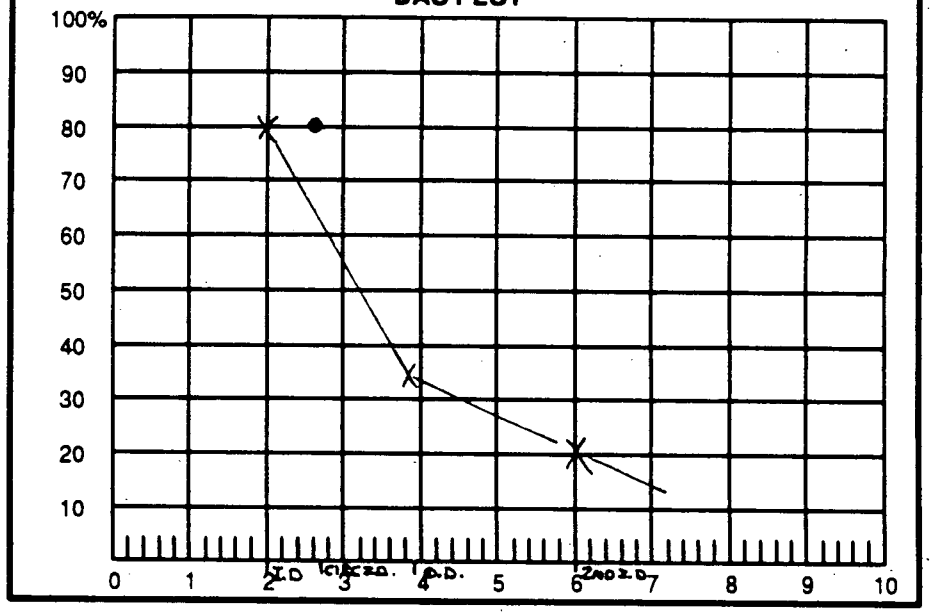
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	19
40	+6	82
20	+12	82

CAL. CHECKS

	TIME
INITIAL CAL.	1338
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1615

DAC PLOT



REMARKS: • = CIRC SCAN I.D. NOTCH
X = AXIAL SCAN I.D NOTCHES, O.D. NOTCH

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/28/93
	2	David G Montes	LEVEL	II	DATE 9/28/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 9-29-93
	2	[signature]	LEVEL	N/A	DATE 9/29/93
	3	[signature]	LEVEL	ADII	DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-003
PAGE 4 OF 8
EXAM ITEM
CPL-212 WELD #7

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #7 M.S.
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 °F

SCAN 0 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO PIPE, COMPLETE BOTH SIDES. EXAMINED 2½T, 360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

N/A

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

N/A

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

N/A

REMARKS:

EXAMINERS:
1 LEVEL III DATE 9/28/93
2 David M Martin LEVEL II DATE 9/28/93

REVIEWERS:
1 Scott Low LEVEL III DATE 9-29-93
2 Richard B. Wilson LEVEL N/A DATE 9/29/93
3 A Palladakes LEVEL ANII DATE 9/29/93

DATA SHEET NO. 1223-003
PAGE 5 OF 8
EXAM ITEM
CPL-212 WELD #7

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #7 MS.
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 ° F

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2½T, 360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2½T, 360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS N/A		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/28/93
2 David J Monteiro LEVEL II DATE 9/28/93

REVIEWERS:
1 [signature] LEVEL III DATE 9-29-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL A/II DATE 9/29/93

DATA SHEET NO. 1223-003
PAGE 6 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #7 M.S.
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 82 ° F

EXAM ITEM
CPL-212 WELD #7

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: PIPE TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2½T, 360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN 60 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2½T, 360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/28/93
2 [signature] LEVEL II DATE 9/28/93

REVIEWERS:
1 [signature] LEVEL III DATE 9-29-93
2 [signature] LEVEL N/A DATE 9/29/93
3 [signature] LEVEL ANII DATE 9/29/93

NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM: Weld# 7

ISO/DWG. NO.: CPL-212

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-003

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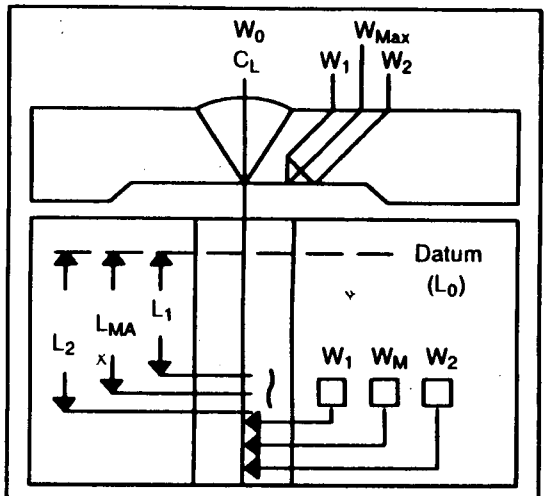


SAMPLE INDICATION

SEARCH UNIT ANGLE 60 °

W_0 LOCATION ℄ of Weld

L_0 LOCATION Outside Radius of U.S Elbow

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.
1	100%	2.1"	2.7"	N/A	N/A	N/A	N/A	*	22"CCW	*	N/A	D.S.
2	100%	1.75"	2.5"	N/A	N/A	N/A	N/A	*	22"CCW	*	N/A	U.S

REMARKS

Indication #1 and #2 were Seen 360° Intermittant at Varying Amplitudes, Due to Backing Ring Geometry. Verified with a 0° ID Profile and Beam Plots.

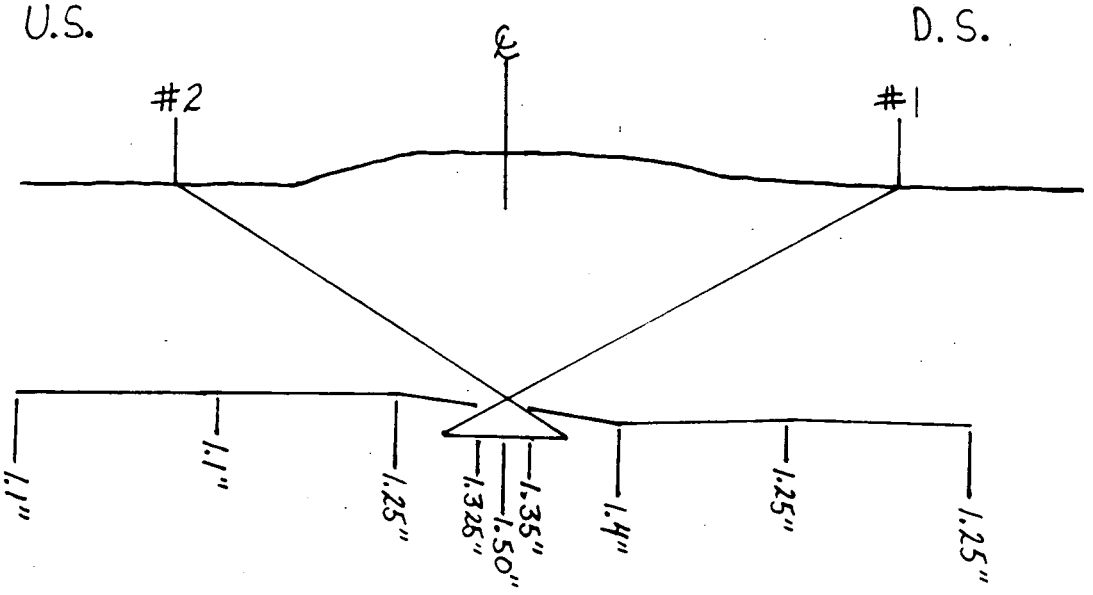
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	[signature]	LEVEL III	DATE 9/28/93
	2	David G Martin	LEVEL II	DATE 9/28/93
REVIEWERS	1	[signature]	LEVEL III	DATE 9-29-93
	2	[signature]	LEVEL N/A	DATE 9/29/93
	3	[signature]	LEVEL ANII	DATE 9/29/93

CPL-212 Weld#7

1223-003
8 of 8

Weld#7



LIII 9/28/93

Reviewed: LIII 9-29-93

DATA SHEET NO. 1223-028
PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-212 Weld 8 +2.5T L.S

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 4.90 Delay 7.82
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 4 dB
Reference Sensitivity 24 :3
Remarks: N/A

SEARCH UNIT

Serial No. B07680
Size .50"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: .40" Exit Point to Front of Wedge.

CALIBRATION BLOCK

No. CPL-56
"T" 1.042" Dia. 26.0"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks 2.5" Screen N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	10
5	60	30	10	10	5

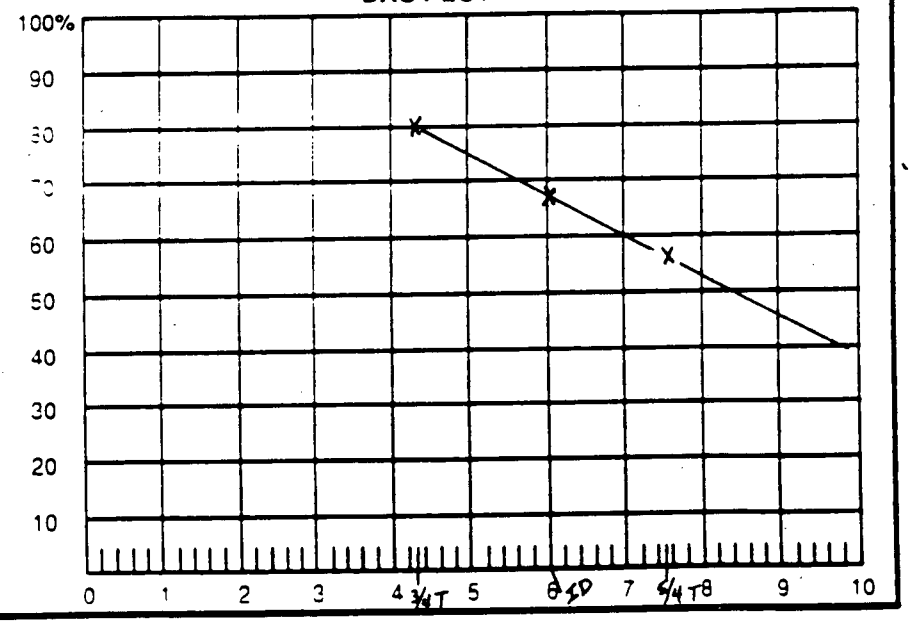
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	80
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0940
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1230

DAC PLOT



REMARKS:

EXAMINERS
1 Tim Ashton LEVEL II DATE 10-8-93
2 Benjamin Sanders LEVEL II DATE 10-8-93

REVIEWERS
1 Scott Lenz LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 A. Wallace LEVEL ANII DATE 10/12/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-028
PAGE 2 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-212 Weld 8 +2.5T L.S.

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 6.95 Delay 7.46
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .50"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 59 °
Cable Type RG 174/U
Cable Length 6'
Remarks: .55" Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-56
"T" 1.042" Dia. 26.0"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial X Circ. N/A
Metal Path X Depth N/A
Each Major Screen Div. = .4"
Remarks 4" Screen N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

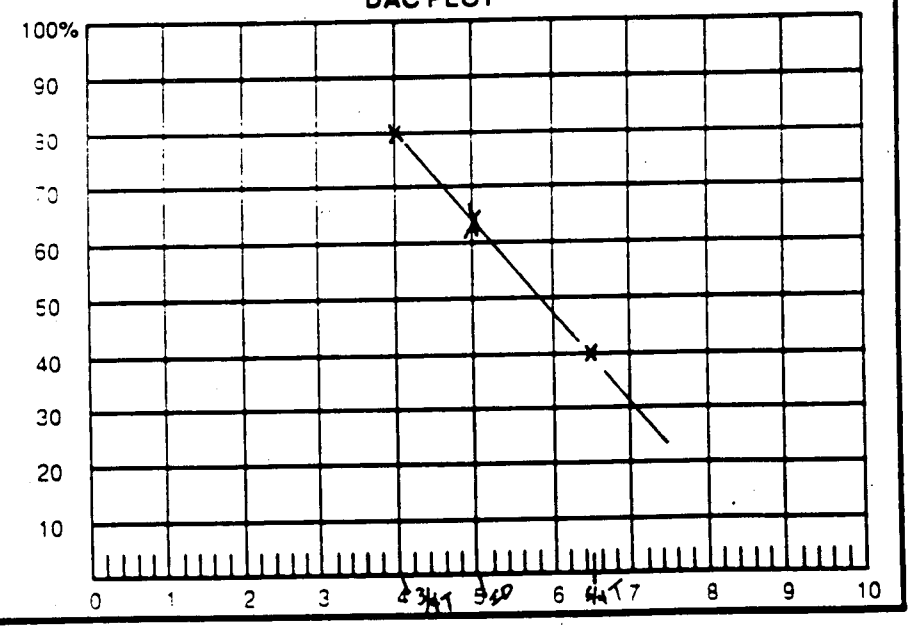
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1003
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1225

REMARKS:

EXAMINERS 1 Tim Addison LEVEL II DATE 10-8-93
2 Benjamin Sanders LEVEL II DATE 10-8-93

REVIEWERS 1 Scott Lowe LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/11/93
3 R Wallace LEVEL AWI DATE 10/12/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-028
PAGE 3 OF 3

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM LOOP A 26" MAIN STEAM
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N SL91-03
COMPONENT TEMP. 76 ° F

EXAM ITEM

WELD # 8 + 2.5" T L.S.

SCAN 45 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 2.5T OF L.S. COMPLETED. N/A

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 2.5T OF L.S. COMPLETED. N/A

EXAMINERS:
1 Tim Oldham LEVEL II DATE 10-8-93
2 Benjamin Sanders LEVEL II DATE 10-8-93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-11-93
2 Richard B Weber LEVEL N/A DATE 10/11/93
3 R P Balladares LEVEL ANII DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. ~~1223-029~~ 1223-029 SL 10-11-93

PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223

REV. 0

CHANGE NO. N/A

CPL-212 Weld 9 +2.5T LS

INSTRUMENT

Model USK-7

Serial No. 27276-807

Sweep Length 4.90 Delay 7.82

Range 2.5

Gain (coarse) 20 dB

Gain (fine) 4 dB

Reference Sensitivity 24 dB

Remarks: N/A

SEARCH UNIT

Serial No. B07680

Size .50"

Frequency 2.25 MHz

Mode Shear

Nom. Angle 45 °

Measured Angle 45 °

Cable Type RG174/U

Cable Length 6'

Remarks: .40" Exit Point to Front of Wedge.

CALIBRATION BLOCK

No. CPL-56

"T" 1.042" Dia. 26.0"

Temperature 70 ° F

Thermometer S/N 962

CALIBRATION

0° N/A Axial X Circ. N/A

Metal Path X Depth N/A

Each Major Screen Div. = .25"

Remarks 2.5" Screen N/A

COUPLANT

Brand Ultragel II

Batch No. 093051

VERTICAL LINEARITY

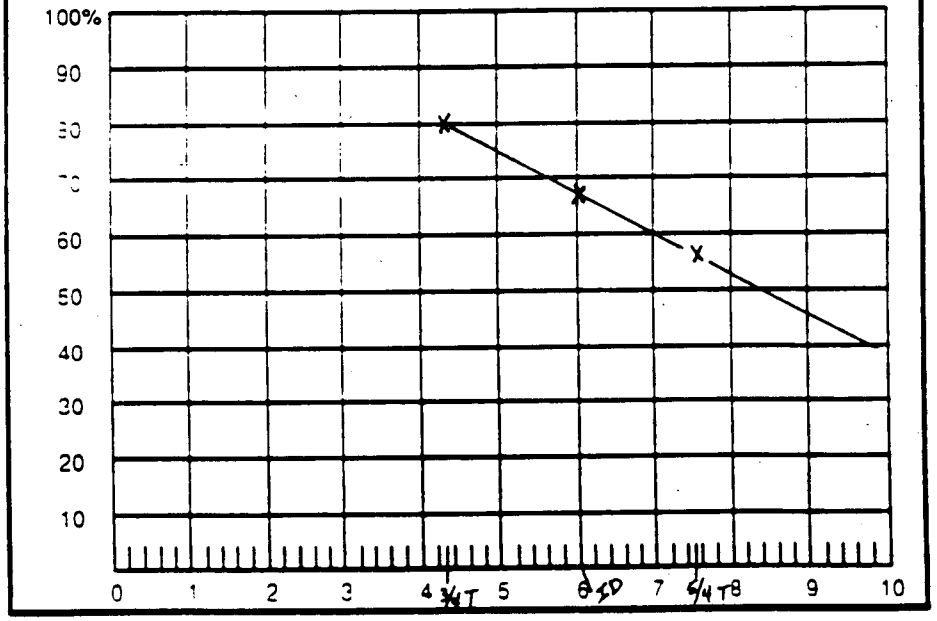
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	26
2	90	45	7	40	20
3	80	40	8	30	16
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	80
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0940
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1230

REMARKS:

EXAMINERS 1 [signature] LEVEL II DATE 10-8-93

2 [signature] LEVEL II DATE 10-8-93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93

2 [signature] LEVEL N/A DATE 10/11/93

3 [signature] LEVEL AWI DATE 10/12/93

DATA SHEET NO. 1223-024
PAGE 2 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-212 Weld 9 +2.5T LS

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 6.95 Delay 7.46
Range 2.5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 %
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .50"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60°
Measured Angle 59°
Cable Type RG 174/U
Cable Length 6'
Remarks: .55" Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-56
"T" 1.042" Dia. 26.0"
Temperature 70 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = .4"
Remarks 4" Screen
N/A

COUPLANT

Brand Ultragel II
Batch No. 093051

VERTICAL LINEARITY

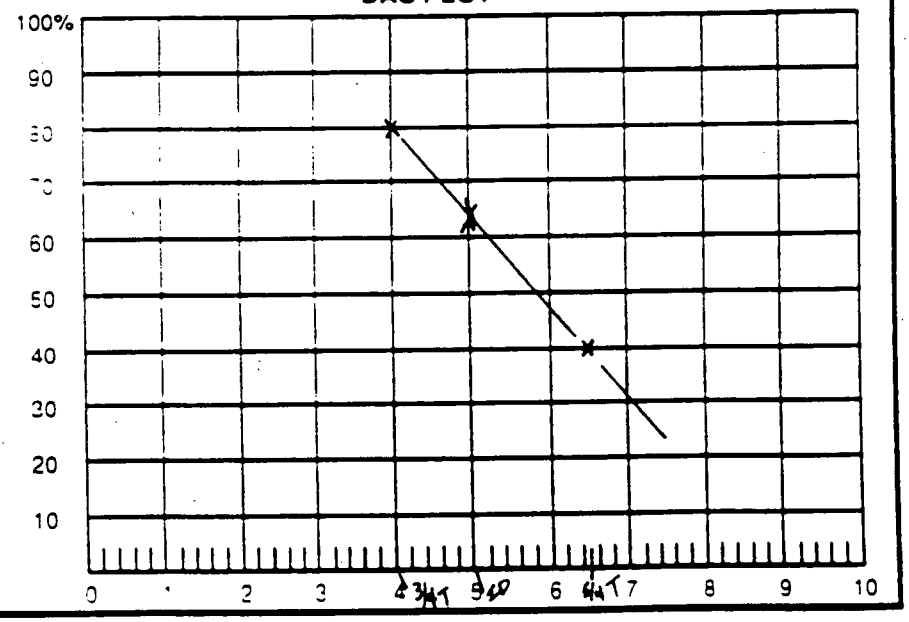
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1003
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1225

REMARKS:

EXAMINERS
1 [signature] LEVEL II DATE 10-8-93
2 [signature] LEVEL II DATE 10-8-93

REVIEWERS
1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1233-52 ~~1225-02G~~ 10-11-93

PAGE 3 OF 3

EXAM ITEM

WELD #9

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 26" MAIN STEAM LOOP A

ISO/DWG. NO. CPL-212 REV. 0

THERMOMETER S/N JL91-03

COMPONENT TEMP. 76 ° F

SCAN 45 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 2.5T OF L.S. COMPLETED N/A

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: 2.5T OF L.S. COMPLETED N/A

EXAMINERS:

1 [signature] LEVEL II DATE 10-8-93

2 [signature] LEVEL II DATE 10-8-93

REVIEWERS:

1 [signature] LEVEL III DATE 10-11-93

2 [signature] LEVEL N/A DATE 10/11/93

3 [signature] LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-027
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-212 Weld 24

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 8.00 Delay 7.78
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 34 / 32 ± dB
Reference Sensitivity = 54 / 52 ± 3
Remarks: N/A

SEARCH UNIT

Serial No. J09185
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60°
Measured Angle 60°
Cable Type RG174/U
Cable Length 6'
Remarks: .3" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-48
"T" .864" Dia. 8"
Temperature 65 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

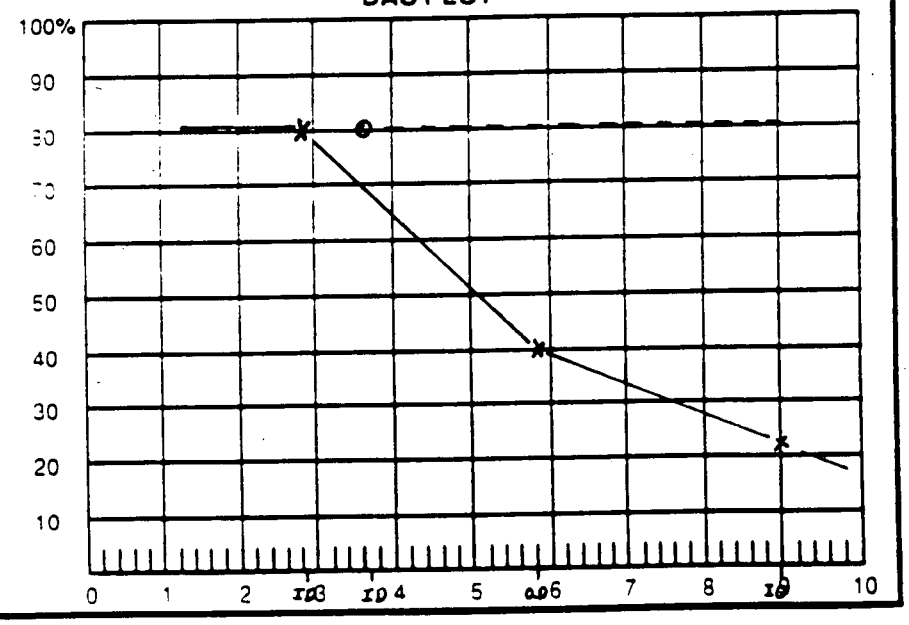
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0810
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1009

REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS	1	David M Martin	LEVEL II	DATE 10/8/93
	2	Steve Wallace	LEVEL I	DATE 10/8/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-11-93
	2	[signature]	LEVEL N/A	DATE 10/11/93
	3	[signature]	LEVEL ANII	DATE 10/12/93

DATA SHEET NO. 1223-027
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL 212 Weld 24

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 8.04 Delay 7.86
Range 2.5"
Gain (coarse) = 20 / 20 ⊥ dB
Gain (fine) = 24 / 16 ⊥ dB
Reference Sensitivity = 44 / 36 ⊥ :3
Remarks: N/A

SEARCH UNIT

Serial No. KD5973
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: .25" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-48
"T" .864" Dia. 8"
Temperature 65 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

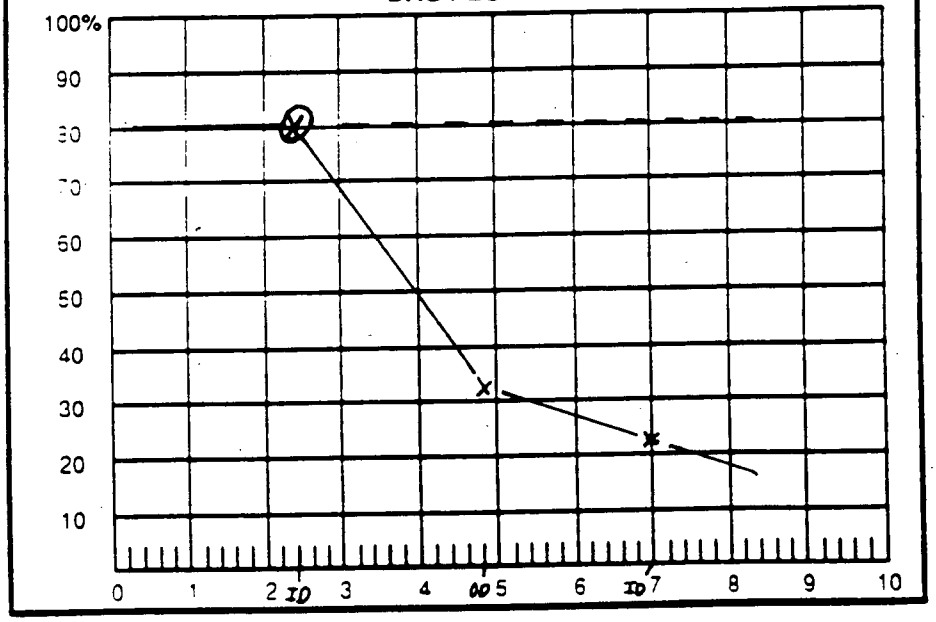
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0825
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1010

REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS	1	David M Martin	LEVEL II	DATE	10/8/93
	2	Steve Wollum	LEVEL I	DATE	10/8/93
REVIEWERS	1	[illegible]	LEVEL N/A	DATE	10/11/93
	2	R Balladares	LEVEL AN II	DATE	10/12/93
	3		LEVEL	DATE	

DATA SHEET NO. 1223-027
PAGE 3 OF 5

EXAM ITEM
CPL-212 WELD #24

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #24 / M.S.
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 66 ° F

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO FLANGE. EXAM LIMITED TO PIPE SIDE. EXAMINED 2½T FOR LONG SEAM COVERAGE.

SCAN 45 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO FLANGE. EXAM LIMITED TO PIPE SIDE. EXAMINED 2½T FOR LONG SEAM COVERAGE.

SCAN 60 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	N/A	✓	✓	N/A	N/A	✓	✓	N/A

REMARKS: PIPE TO FLANGE. EXAM LIMITED TO PIPE SIDE. EXAMINED 2½T FOR LONG SEAM COVERAGE.

SCAN 60 ° SCAN dB 60				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO FLANGE. EXAM LIMITED TO PIPE SIDE. EXAMINED 2½T FOR LONG SEAM COVERAGE.

EXAMINERS:
1 David G Montes LEVEL II DATE 10/8/93
2 Steve Wollum LEVEL I DATE 10/8/93

REVIEWERS:
1 Richard B. Weber LEVEL N/A DATE 10/4/93
2 R C Balladares LEVEL ANII DATE 10/12/93
3 _____ LEVEL _____ DATE _____

EXAM ITEM

WELD #24

ISO/DWG. NO.

CPL - 212

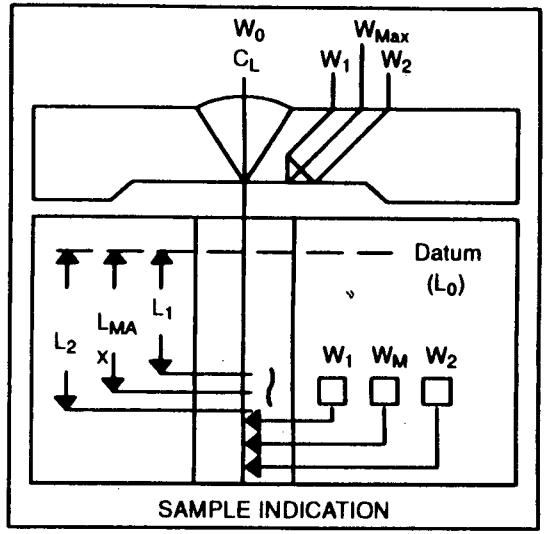
ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-027

PAGE 4 OF 5

SEARCH UNIT ANGLE 60 ° W_0 LOCATION WELD 8 L_0 LOCATION VALVE



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	70%	2.0	1.6"	N/A	N/A	N/A	N/A	N/A	45"CCW	N/A	N/A	U.S.	COUNTER BORE (SEEN 360° AT NON RECORDABLE AMPLITUDE WITH 45° SHEAR)
							N						
								A					

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	David M Martin	LEVEL	II	DATE 10/8/93
	2	Steve Wolken	LEVEL	I	DATE 10/8/93
REVIEWERS	1	Richard B Weber	LEVEL	N/A	DATE 10/11/93
	2	R Mallindare	LEVEL	ANII	DATE 10/12/93
	3	_____	LEVEL	_____	DATE _____

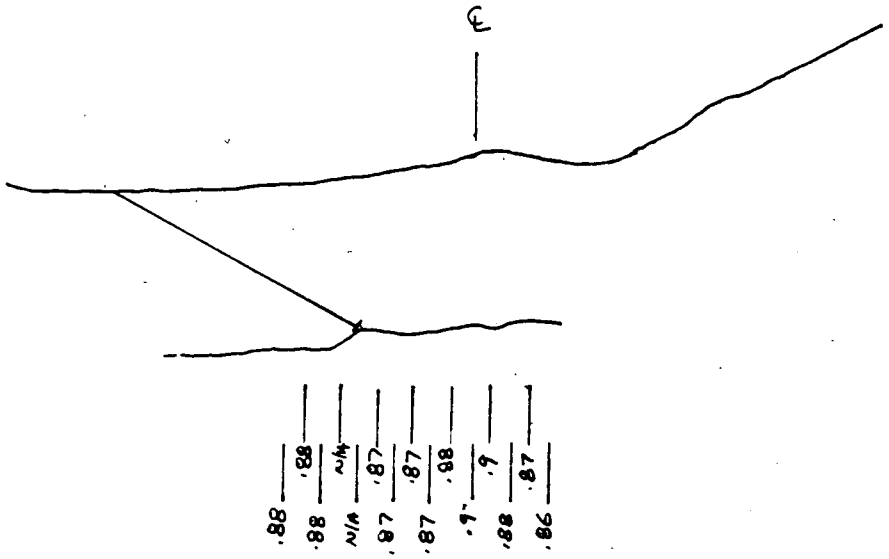
NUCLEAR ENERGY SERVICES, INC.

1223- 027
5 of 5

CPL-212 WELD # 24

PIPE SIDE

FLANGE SIDE

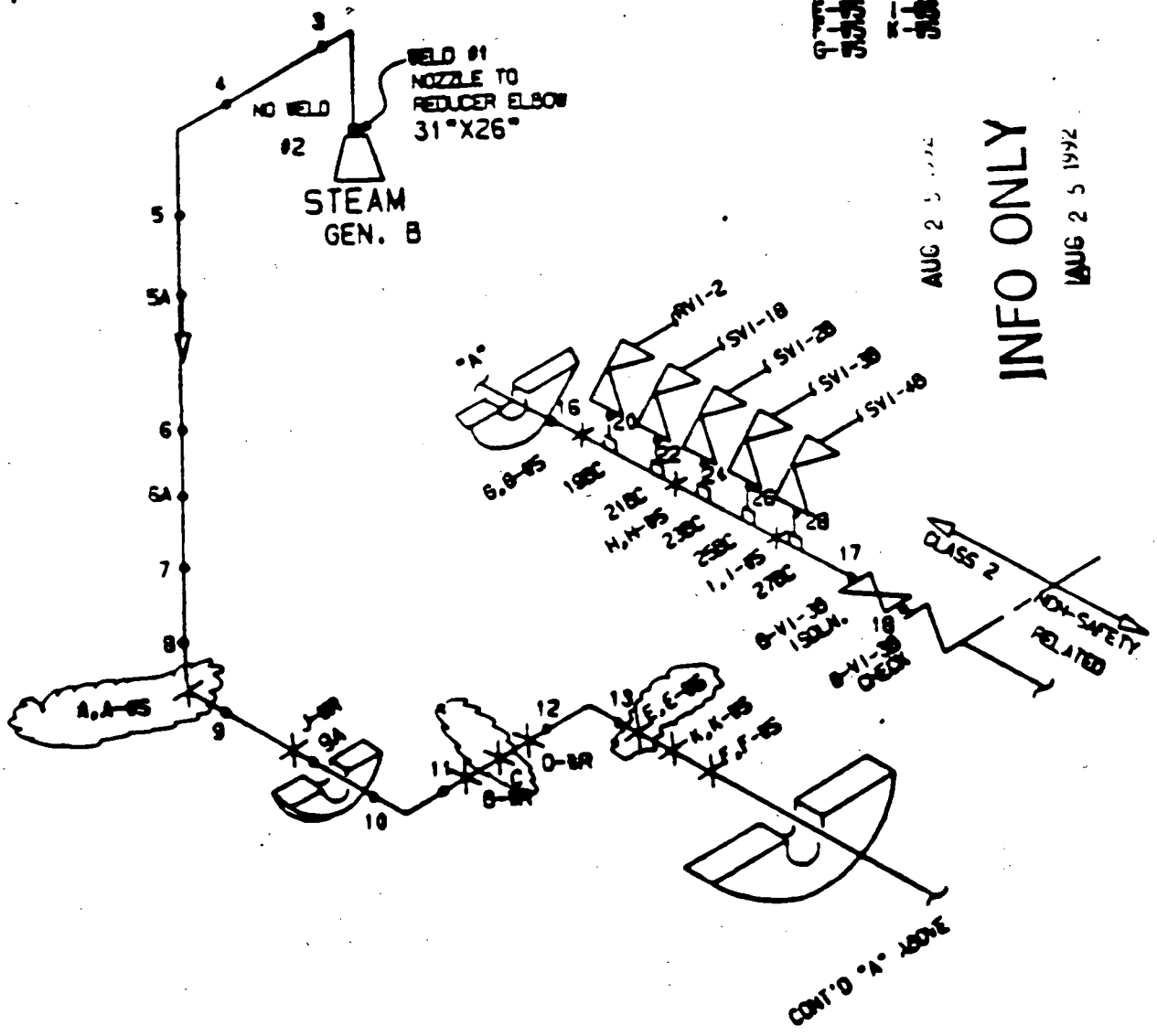


David M Martin LEVEL II 10/8/93

SPRING HANGERS

A,C

WELDED SUPPORT



INFO ONLY

AUG 25 1992

AUG 25 1992

CP & L Dwg. No. H-SK2-10618 SH. 72					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/13/89

CPL-213 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP B 26" MAIN STEAM	
LINE NO. 26"-MS-B	CPL- 213 REV.

C F & L

I certify that the image contained on this frame was made [illegible] course of business on the date

DATA SHEET NO. 1218-011
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED MAIN STEAM ISO/DWG/SK. # CPL-213 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "A-WS"	NO INDICATIONS NOTED	X	N/A
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 10-8-93
EXAMINER [signature] LEVEL II DATE 10-8-93
REVIEWER [signature] LEVEL III DATE 10-9-93
REVIEWER [signature] DATE 10/9/93
REVIEWER ANIL R. Valladares DATE 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-071
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: MAIN STEAM	Component Name: VARIABLE SUPPORT	Component ID: 213 A
Drawing/Location: CPL-213 R/C / Rx Bldg. 275' Elev. Below GRATING (NEXT MAIN STEAM PIPE)		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

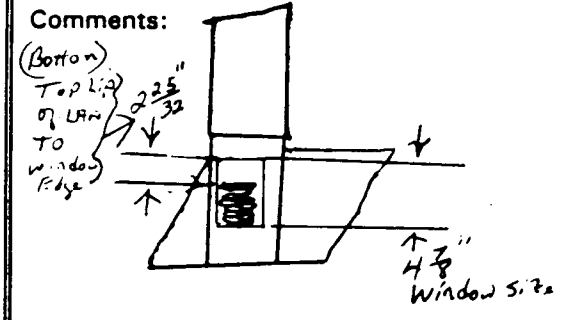
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: $2\frac{25}{32}$" From Edge of Window (See Sketch)		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

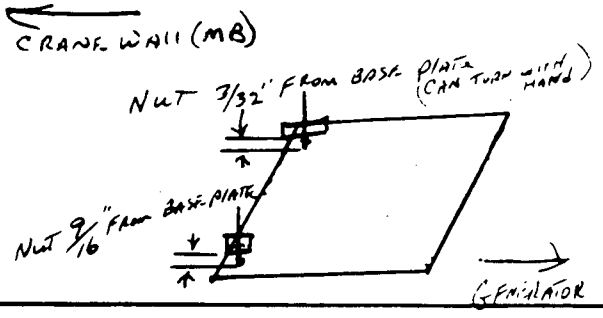
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:





(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-025
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: MS	Component Name: VARIABLE SUPPORT	Component ID: 213C
Drawing/Location: CPL-213 R/O / RX. BLDG. 251'-8" F/O. MAT TO ELEVATOR		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

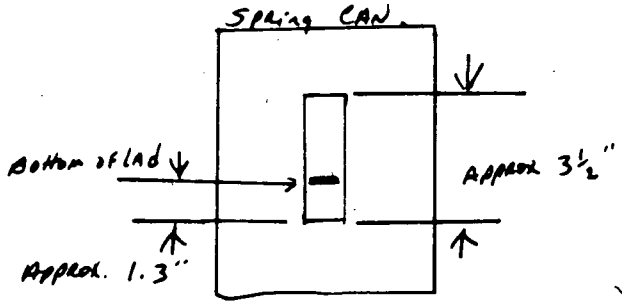
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks			
Missing attachment/hardware	✓		
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments:



NO GAUGE MARKER ON CAN

Reviewed: [signature] LEVEL III 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

Acceptable as is per Site Memo TSE-93-CJ

ISI Reviewer: Richard O. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AWH A. W. Williams 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project NB2 Job No. PSI ☐ ISI ☒

System: MS	Component Name: Variable Support	Component ID: 213 C
Drawing/Location: CPL 213 Rev 0 / Containment 2nd level		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		N/A	
Mechanical interference		N/A	
Cracks		✓	
Missing attachment/hardware		N/A	
Loose/missing parts		N/A	
Abnormal wear		N/A	
Abnormal corrosion		N/A	
Abnormal gouges		N/A	
Arc Strikes on sliding support		N/A	
Misalignment of the support		N/A	
Variable/Constant Support	Actual:		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: [illegible] Date: 10/28/93

Examiner: Level: Date:

Comments: This inspection documents that there was no cracks on the structural members of the hanger. Report # 1230-025 does not have the block marked or N/A'd. Other attributes are the same as the original report. PT 10/28/93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/28/93

QA NDE-ISI 11, Rev. 0, 07/93

ANII RPalladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: MAIN STEAM	Component Name: Support / Hanger	Component ID: 213E
Drawing/Location: CPL-213 R/O / RX. BLDG. - FLOOR Elev. 251'-8"		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

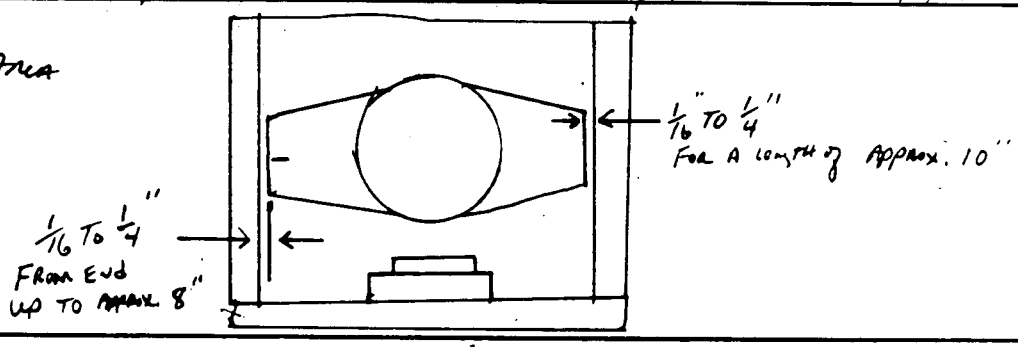
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:
RUST ON AREA



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CP

ISI Reviewer: [signature] Date: 10/28/93

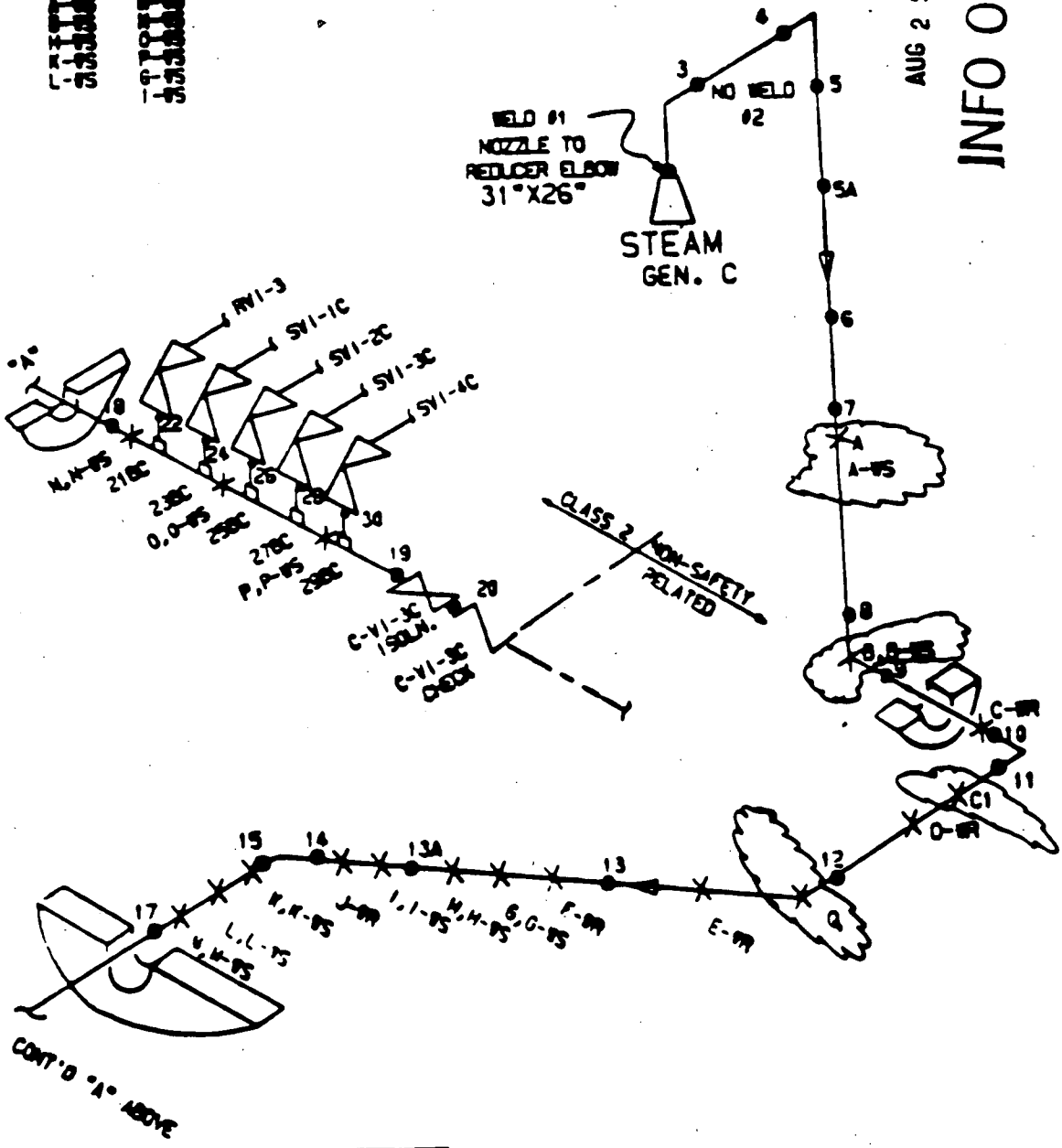
QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

SPRING HANGERS
B,G,I,Q,C1

WELDED SUPPORT

[redacted]



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-10618 SH. 73					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHKD BY	APPD BY	DATE
0	RBW	CPLL	CLO	CLO	12/10/92

CPL-214 REV. 0

H.B. ROBINSON S.E. PLANT	CP&L
UNIT NO. 2	
DESCRIPTION: LOOP C 26" MAIN STEAM	
LINE NO. 26"-MS-C	CPL- 214 REV.

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-070
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System:	Component Name: Support/Hanger	Component ID: 214-A
Drawing/Location: CPL-214 R/O /Rx. Bldg. - 275'-Floor Elev. @ Grating		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☐ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Palladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-072
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: MAIN STEAM	Component Name: Support / Hanger	Component ID: 214-B
Drawing/Location: CPL-214-R/0 / RX. Bldg. 1-FLOOR - ELEV. 275' BELOW GRATING		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support	↓	✓	
Misalignment of the support	N/A		
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☑ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/13/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/13/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-074
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: MAIN STEAM	Component Name: VARIABLE SUPPORT	Component ID: 214-C1
Drawing/Location: CPL-214 R/O / AX BLG.-FLOOR ELEV 251'-8"		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 10,500 #		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Walker Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII RB Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-053
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: MS	Component Name: VARiable Support	Component ID: 214 Q
Drawing/Location: CPL-214 R/D / RX. bldg. -25'-8" Elev.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 8,250 #		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: III Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

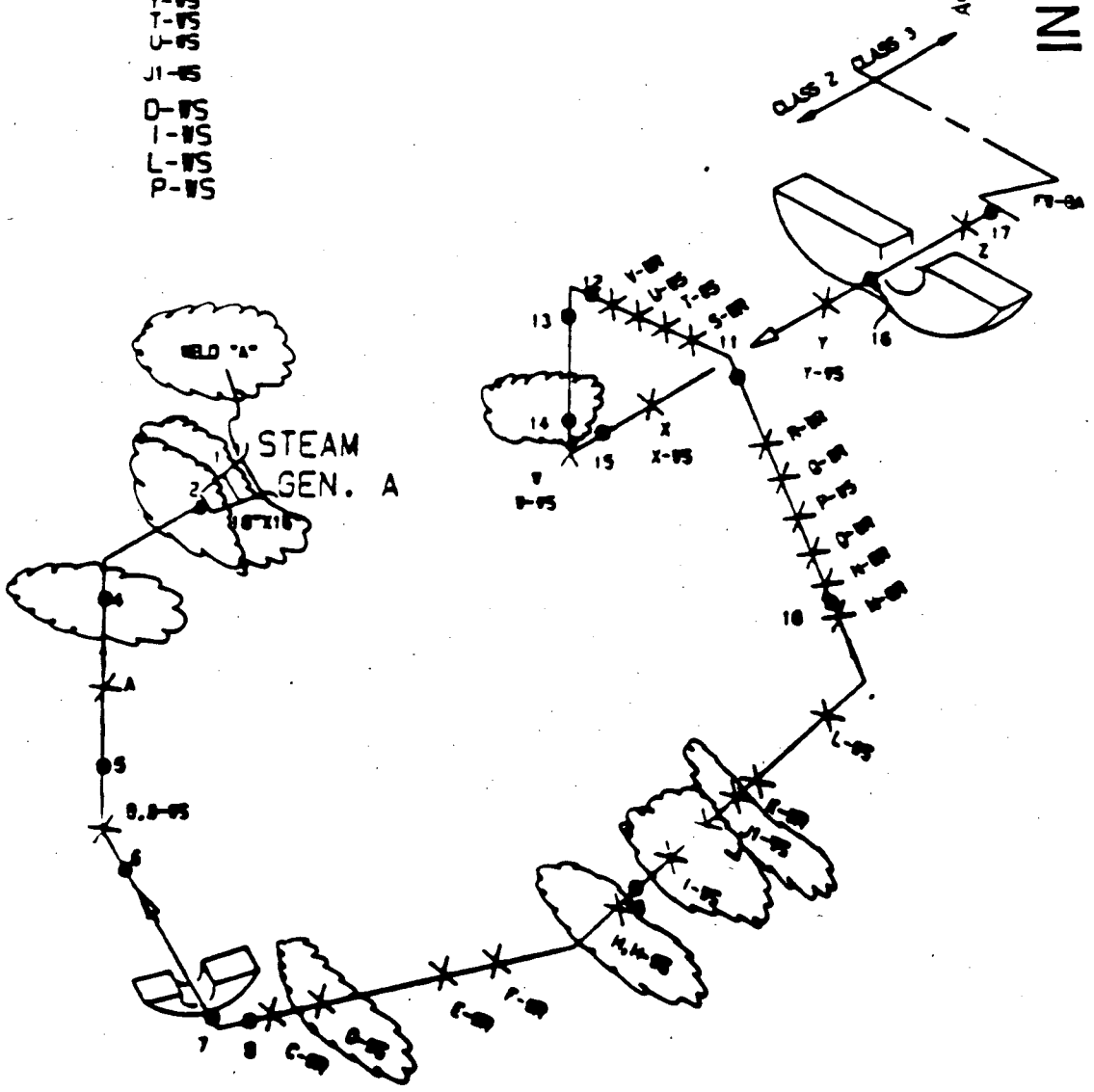
Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] 10/7/93

ANII R Wallace 10/7/93

INFO ONLY



CP & L Dwg. No. HBR2-01618 SH 76					
CP & L P.O. No. CPL-31					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHECKED BY	APPD BY	DATE
0	RBW	CHL	CLO	CLO	12/12/89

CPL-215 REV. 0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP A 16" FEEDWATER	
LINE NO. 16-FDW-A	CPL- 215 REV.

CP&L

I certify that the image contained on this frame was made in the normal and regular course of business on the date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-060
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: FEEDWATER	Component Name: VARIABLE SUPPORT	Component ID: 215-D
Drawing/Location: CPL-215 R/C / RX. BLDG. 251'-8" FLOOR ELEV.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		SEE COMMENT
Variable/Constant Support	Actual: 2250# (NEAR MISSILE BARRIER) AND 2025# (NEAREST SECONDARY WALL)		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: HOT LOAD REQUIRES - 2700# AND COLD LOAD REQUIRES 2250# IN ACCORDANCE WITH DRAWING

(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-EK

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R. Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-067
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: FEEDWATER	Component Name: SUPPORT/HANGER	Component ID: 215-H
Drawing/Location: CPL-215 R/O / Rx. Bldg. 251'-8" Floor Elev.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Simpson Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-068
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: FEEDWATER	Component Name: VARIABLE SUPPORT	Component ID: 215 I
Drawing/Location: CPL-215 R/C / RX. Bldg. -251'-8" Floor Elev.		
☒ VT-3 Procedure: Sp. 1230 Rev. C	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2040# (Near Crane Wall) and 1870# (Near Secondary Wall)		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sing Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

ANII R. Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-018
Page 1 of 2

Project | Job No. | PSI☐ ISI☒

System: FEEDWATER	Component Name: SUPPORT/HANGER	Component ID: 215 J
Drawing/Location: CPL-215 R/0 / Rx. Bldg., El. 251½' El. ABOVE AND NEAR HVE-3 FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		SEE ATTACHED SKETCH
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear	✓		SEE ATTACHED SKETCH
Abnormal corrosion	✓		SEE ATTACHED SKETCH
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		SEE ATTACHED SKETCH
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-30-93

Examiner: N/A Level: N/A Date: N/A

Comments: SEE PAGE 2 OF 2 FOR SKETCH

Reviewed: [signature] LIII 9-30-93

(ISI Use Only)
☒ Pass
☐ Fail

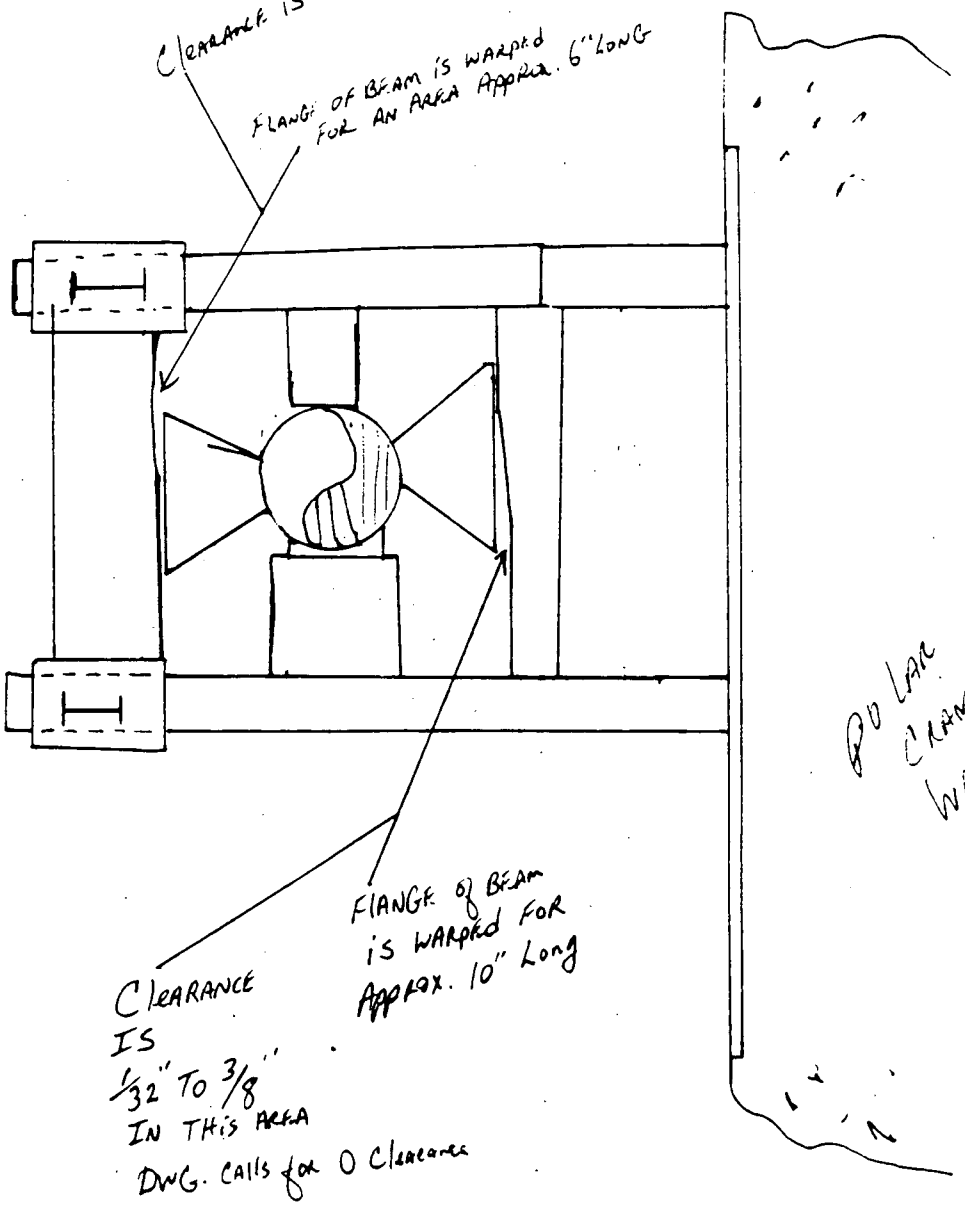
Accepted per Site Memo T5E-93-CD

ISI Reviewer: [signature] Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

CPL-215 J
Page 2 of 2



Eugene Gray
9-30-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-013
Page 1 of 2

Project | Job No. | PSI☐ ISI☒

System: FEEDWATER	Component Name: VARIABLE SUPPORT	Component ID: 215-J1
Drawing/Location: CPL-215R/0 / RX. BLDG.-ELEVATION 265'-0" NEAR HVE-3 FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		SEE SKETCH
Abnormal wear	✓		SEE SKETCH
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		SEE SKETCH
Variable/Constant Support	Actual: A)-2775 LBS. B)-3600 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-30-93

Examiner: N/A Level: N/A Date: N/A

Comments: THIS SUPPORT IS NEXT TO 215 J WHICH HAD DAMAGE AT THE TIME OF THIS INSPECTION.

Reviewed: [signature] LII 9-30-93

(ISI Use Only)
☒ Pass
☐ Fail

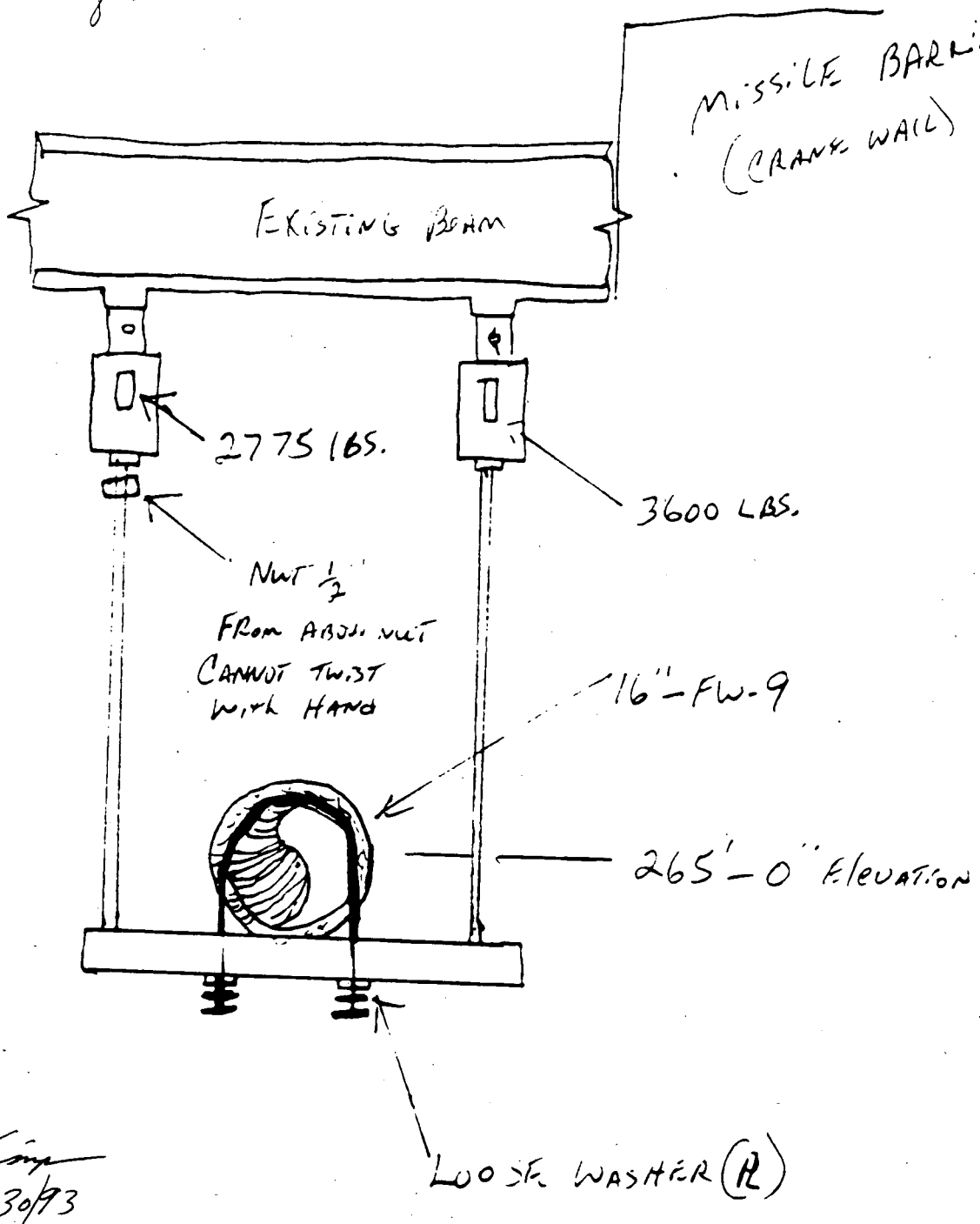
Accepted per Site Memo TSE-93-CE

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 10/30/93

CPL-215 J1
page 2 of 2



Eliza Sing
P 9/30/93

VIEW LOOKING NORTH

DATA SHEET NO. 1218-001
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ** INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED FEEDWATER SG "A" ISO/DWG/SK. # CPL-215 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY
** SEE EXAM ITEM FOR NOMINAL THICKNESS (NT:)

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER RESEARCH
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS A/C
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "A" NT: 3"	NO RECORDABLE INDICATIONS NOTED	X	N/A
WELD "1" NT: 1.156"	" " " "	X	
WELD "1LS" NT: 1.156"	" " " "	X	
WELD "2" NT: 1.031"	" " " "	X	
WELD "2LS" NT: 1.031"	" " " "	X	
WELD "4" NT: 1.031"	" " " "	X	
WELD "4LS" NT: 1.031"	" " " "	X	
N/A	N/A	N/A	

EXAMINER Kenneth R. Lowe LEVEL II DATE 9/23/93
EXAMINER Steve Wolfem LEVEL II DATE 9/23/93
REVIEWER Scott Kary LEVEL III DATE 9-24-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANIL R. Valladares DATE 9/25/93

DATA SHEET NO. 1218-006
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 1 INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED FEEDWATER UNIT 2 ISO/DWG/SK. # CPL-215 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER PROBE
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "14"	NO INDICATIONS NOTED	X	N/A
WELD "14LS" (2.5T)	NO INDICATIONS NOTED	X	
N/A	N/A		

EXAMINER Kenneth D. Hare LEVEL II DATE 9/29/93
EXAMINER Steve Wollum LEVEL II DATE 9-29-93
REVIEWER Scott Lange LEVEL III DATE 9-30-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Ann A. Valladares DATE 10/5/93

CPL - 215
Welds 1, 2, and 4
Base Metal at Red. /El.

The attached data associated with NES data sheet package 1223-009 includes the ISI required examination of CP&L 215 1, 2, and 4. A supplemental examination of the Base metal at the Reducer/ Elbow for thermal fatigue cracking was also performed. UT techniques used were as follows:

1. 45° and 60° shear wave circ. and axial scans of the WRV and base metal at reducer/elbow.
2. 45° RL and 60° RL axial scans of the WRV and adjacent base material ~ 4" either side of welds. This exam was for the detection of flaw tips.

Scott Lamm Lttt 10-4-93

DATA SHEET NO. 1223-009
PAGE 1 OF 53

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CDL-215 WELD #1

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.07 Delay 9.83
Range .5"
Gain (coarse) 20 dB
Gain (fine) 36 dB
Reference Sensitivity 56 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CDL-215 WELD #1
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

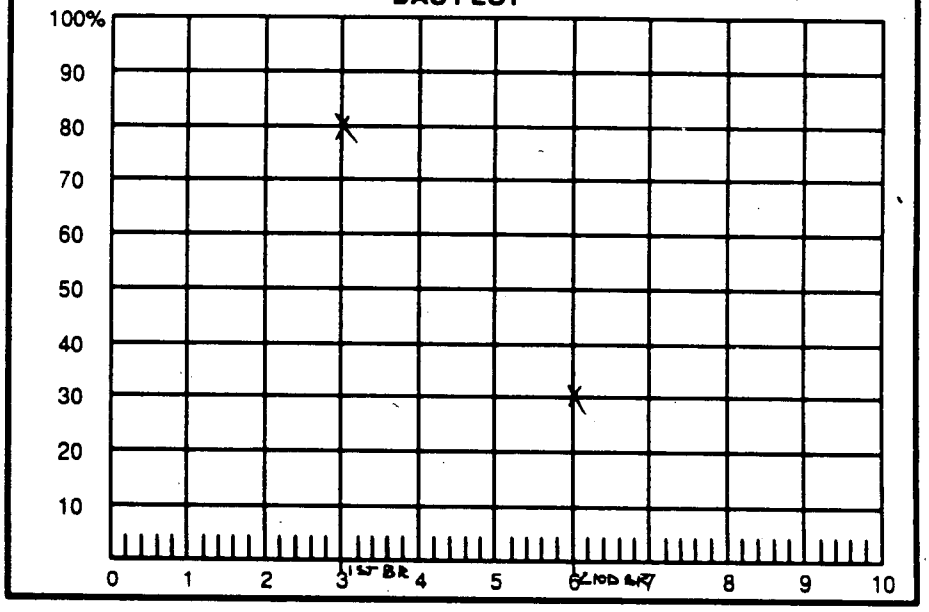
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0817
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	0855

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/24/93
2 [signature] LEVEL II DATE 9/24/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-009
PAGE 2 OF 53

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #1

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 4.90 Delay 7.60
Range 2.5"
Gain (coarse) 10/=0 dB
Gain (fine) 22/=30 dB
Reference Sensitivity 22/=30 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

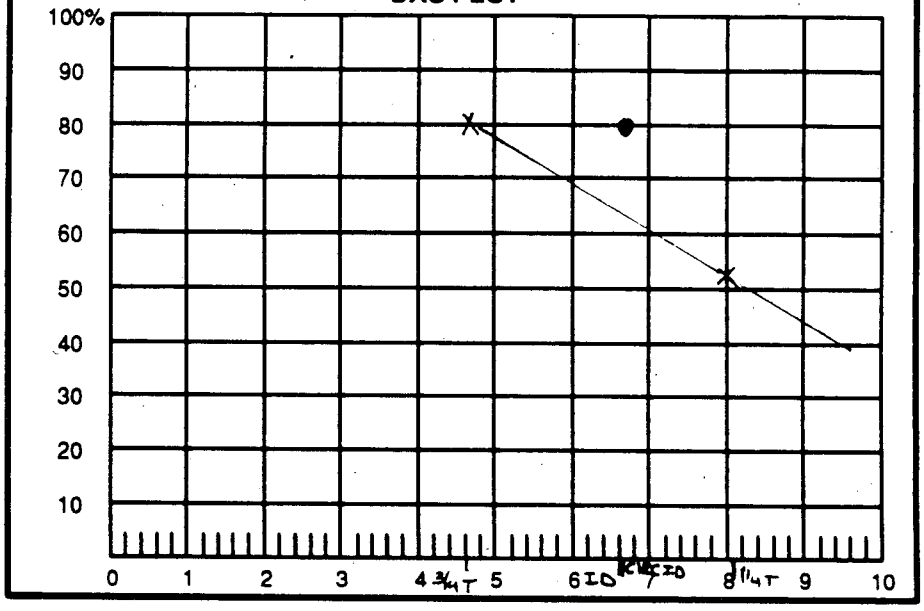
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0825
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1250

REMARKS: -12dB I.D. NOTCH TO DAC
● = CIRC. I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS 1 [signature] LEVEL III DATE 9/24/93
2 David A Martin LEVEL II DATE 9/24/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 Richard B. Wigler LEVEL N/A DATE 10/9/93
3 R Valladares LEVEL AUII DATE 10/12/93

DATA SHEET NO. 1223-009
PAGE 3 OF 53

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #1

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.04 Delay 7.46
Range 2.5"
Gain (coarse) +20/=20 dB
Gain (fine) +20/=20 dB
Reference Sensitivity +40/=40 dB
Remarks: N/A

SEARCH UNIT

Serial No. EIB404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .5
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

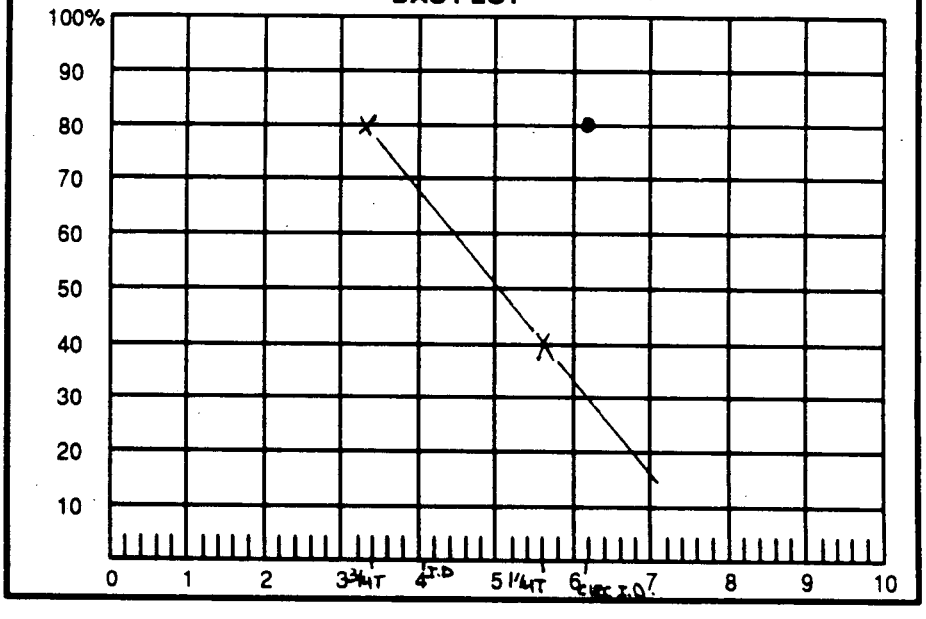
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0835
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1245

REMARKS: I.D. NOTCH FALLS AT DAC
● = CIRC. I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS 1 [signature] LEVEL III DATE 9/24/93
2 [signature] LEVEL II DATE 9/24/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/4/93
3 [signature] LEVEL AN II DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
PAGE 4 OF 53
EXAM ITEM
CPL-215 Weld#1

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld#1 F.W.
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 °F

SCAN 0 ° SCAN dB 62				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
✓	N/A	N/A	N/A		N/A	N/A		N/A			N/A

REMARKS: Reducer to Nozzle, Complete Both Sides
Examined 2.5T/360° Both Sides of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 LEVEL III DATE 9/24/93
2 David M Marte LEVEL II DATE 9/24/93

REVIEWERS:
1 Scott LEVEL III DATE 10-1-93
2 Richard B. LEVEL N/A DATE 10/9/93
3 R Valladares LEVEL ANII DATE 10/2/93

NES 9/90 – REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. L223-009
PAGE 5 OF 53

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #1 F.W.
ISO/DWG. NO CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
CPL-215 Weld #1

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only
Examined 2.5T/360° Reducer Side of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN 45 ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Both Sides
Examined 2.5T/360° Reducer Side for Long Seam Coverage.
No Long Seams Visible

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/24/93
2 David M Mantz LEVEL II DATE 9/24/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/8/93
3 [signature] LEVEL ANI DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
PAGE 6 OF 53

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld # 1 F.W.
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
CPL-215 Weld #1

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only
Examined 2.5T/360° Reducer Side of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Both Sides
Examined 2.5T/360° Reducer Side of Weld for Long Seam Coverage
No Long Seams Visible

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/24/93
2 David M Master LEVEL II DATE 9/24/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

POT 53

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-009
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-749
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: B05236
Frequency: 2.25 Mhz
Size: .5 x .5
Manufacturer: AEROTECH

SIMULATOR BLOCK

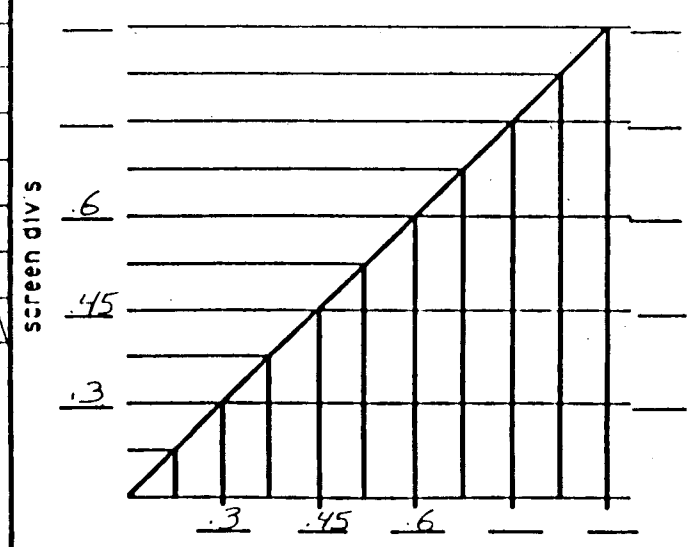
ID:
Reflector Type:
CE-2: ____ Div's N/A
Pulse Separation: ____ Depth

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/fine	12	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: ____ Div's

Measured Beam Angle 45 deg.

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

remarks CPL-215 WELD #1

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	III	10-1-93	BWS 9/9/93 RP Valladares	10-12-93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-009
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type: N/A
Material:
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-807
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: 2211-93001
Frequency: Mhz
Size: 2 (25mm x 12mm)
Manufacturer: SIGMA

SIMULATOR BLOCK

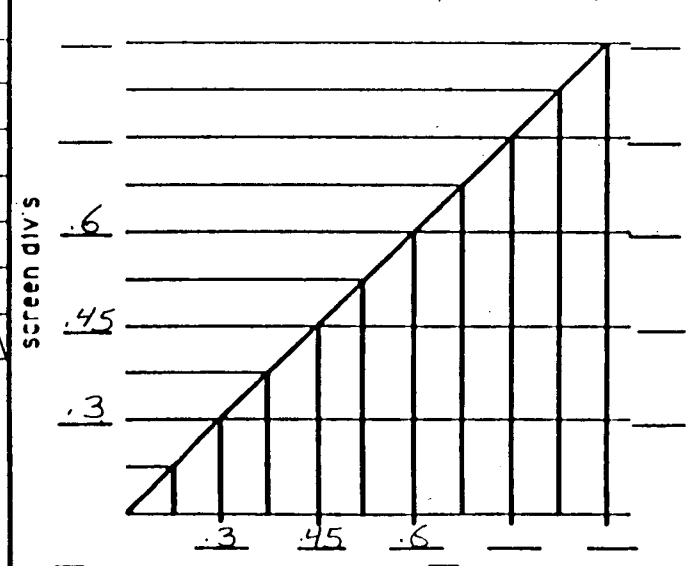
ID:
Reflector Type: N/A
CE-2: Div's
Pulse Separation: Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	6.70	
Mat'l Cal	7.90	N/A
Frequency	FIXED	
Gain/Coarse	20	
Gain/Fine	34	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION



☐ % thru wall ☒ depth in inches

METHOD

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70

Measured Beam Angle: 60 deg.

CE-2: Div's

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1030

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

remarks: CPL-215 WELD #1

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	III	10-1-93	ROW 9/9/93 [signature]	10-12-93

DATA SHEET NO. 1223-009
PAGE 9 OF 53
EXAM ITEM

Weld # 1

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld # 1 FW
ISO/DWG. NO. CPL 215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 David M Master LEVEL II DATE 9/30/93

REVIEWERS:
1 Scott [illegible] LEVEL III DATE 10-1-93
2 Richard A Wilson LEVEL N/A DATE 10/9/93
3 R Valladares LEVEL AWI DATE 10/12/93

DATA SHEET NO. 1223-009
PAGE 10 OF 53

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

08215 REDUCER BASE MATERIAL

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.04 Delay 7.46
Range 2.5"
Gain (coarse) L20/=20 dB
Gain (fine) L20/=20 dB
Reference Sensitivity L40/=40 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 6'
Remarks: .5" Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093001

VERTICAL LINEARITY

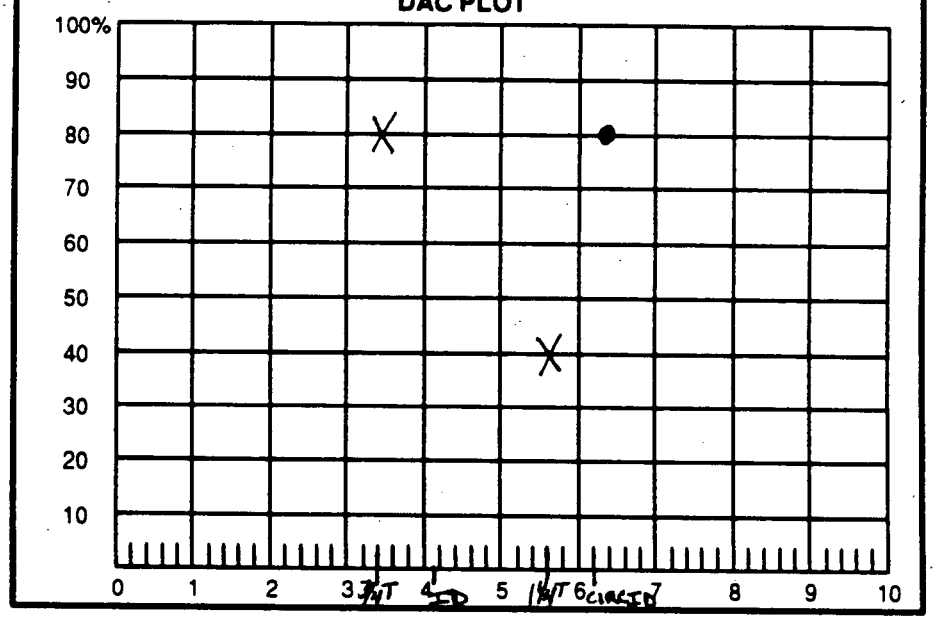
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0835
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1245

REMARKS: ID Notch Falls at Dac
X = Axial Scan
● = Circ Scan

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/24/93
	2	[signature]	LEVEL	II	DATE 9/24/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 9-30-93
	2	Richard A. Weber	LEVEL	N/A	DATE 10/9/93
	3	[signature]	LEVEL	ANII	DATE 10/14/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "A" S/G F.W. REDUCER
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
"A" S/G F.W. REDUCER BASE MATERIAL

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR THERMAL FATIGUE CRACKING. NONE DETECTED

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/24/93
2 [signature] LEVEL II DATE 9/24/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-009
PAGE 12 OF 53

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CRC-215 REDUCER BASE MATERIAL

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 4.90 Delay 7.60
Range 2.5"
Gain (coarse) L0/=0 dB
Gain (fine) L22/=30 dB
Reference Sensitivity L22/=30 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG174/U
Cable Length 6'
Remarks: .4" Exit Point to Front of Wedge

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

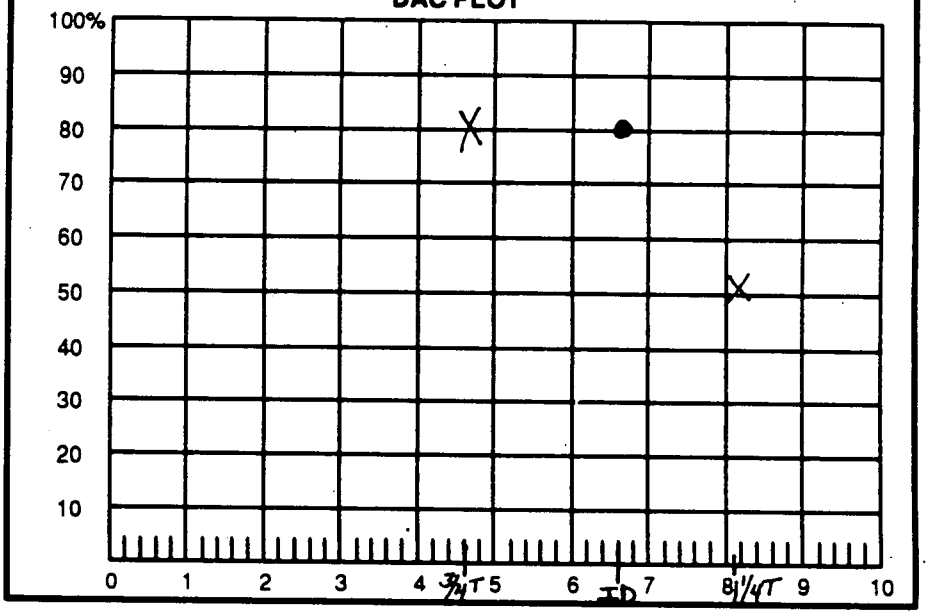
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	0825
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1250

DAC PLOT



REMARKS: -12dB ID Notch to Dac
X = Axial Scan
● = Circ Scan

EXAMINERS 1 [signature] LEVEL III DATE 9/24/93
2 [signature] LEVEL II DATE 9/24/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/6/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-004
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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "A" S/G FW REDUCER
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
"A" S/G F.W REDUCER BASE MATERIAL

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR THERMAL FATIGUE CRACKING. NONE DETECTED

SCAN 45 ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR THERMAL FATIGUE CRACKING. NONE DETECTED

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 _____ LEVEL III DATE 9/24/93
2 _____ LEVEL II DATE 9/24/93

REVIEWERS:
1 _____ LEVEL III DATE 10-1-93
2 _____ LEVEL N/A DATE 10/9/93
3 _____ LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #2

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 7.1 Delay 7.9
Range .5"
Gain (coarse) 20 dB
Gain (fine) 24 dB
Reference Sensitivity 44 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. 80C3613E
"T" .1" - 1.0" Dia. N/A
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .15"
Remarks PROFILE THICKNESS ONLY

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

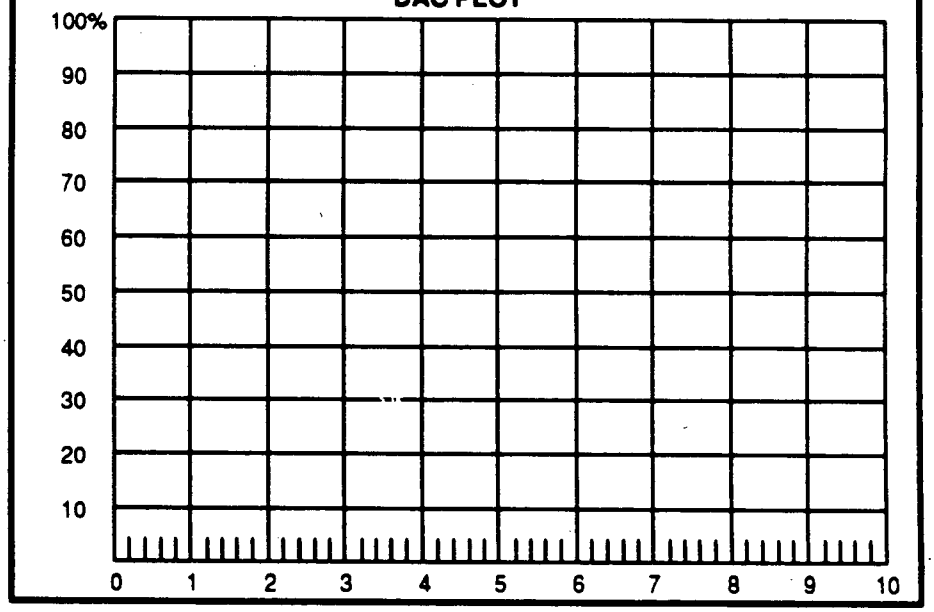
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0815
INTERMEDIATE	1046
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1300

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/25/93
2 [signature] LEVEL II DATE 9/25/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL AN II DATE 10/12/93

DATA SHEET NO. 1223-009
PAGE 15 OF 53

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #2

INSTRUMENT

Model USM-7
Serial No. 27276-807
Sweep Length 8.05 Delay 7.52
Range 2.5"
Gain (coarse) +20/=20 dB
Gain (fine) +22/=24 dB
Reference Sensitivity +42/=44 dB
Remarks: N/A

SEARCH UNIT

Serial No. EIB404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 4.010" Dia. 16"
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

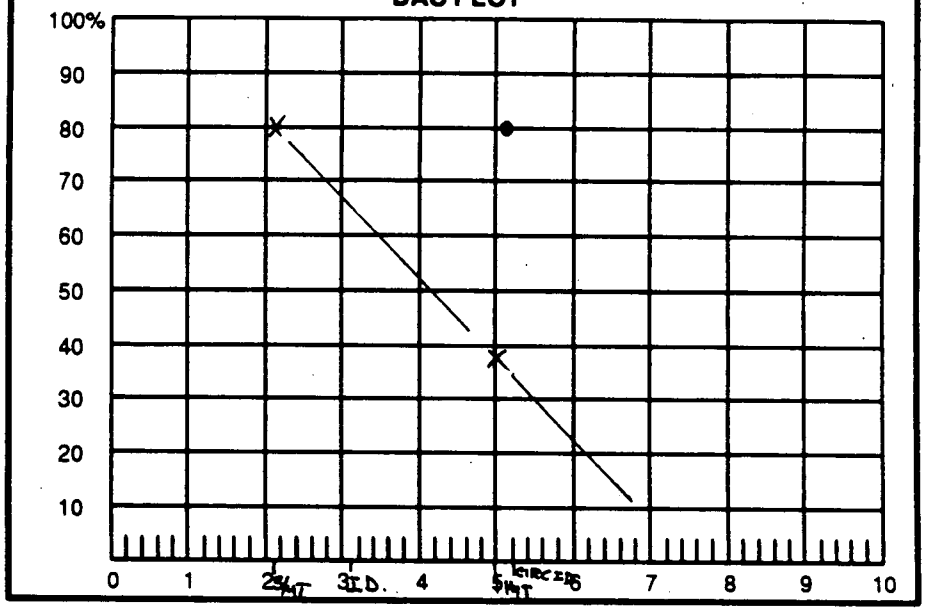
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	78
20	+12	76

CAL. CHECKS

	TIME
INITIAL CAL.	0824
INTERMEDIATE	1046
INTERMEDIATE	1300
INTERMEDIATE	N/A
FINAL CAL.	1530

DAC PLOT



REMARKS: I.D. NOTCH FALLS AT DAC
●: CIRC. I.D. NOTCH
X: AXIAL S.D.H.

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/25/93
	2	David M Wentz	LEVEL	II	DATE 9/25/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-1-93
	2	[signature]	LEVEL	N/A	DATE 10/9/93
	3	[signature]	LEVEL	ANII	DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
PAGE 16 OF 53

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #2 F.W.
ISO/DWG. NO CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
CPL-215 Weld #2

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Elbow Side
Examined 2.5T/360° Elbow Side for Long Seam Coverage.
No Long Seams Visible

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Elbow Side
Examined 2.5T/360° Elbow Side for Long Seam Coverage
No Long Seams Visible

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/25/93
2 David M Mantz LEVEL II DATE 9/25/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/15/93

EXAM ITEM: Weld #2

ISO/DWG. NO.: CPL-215

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-002

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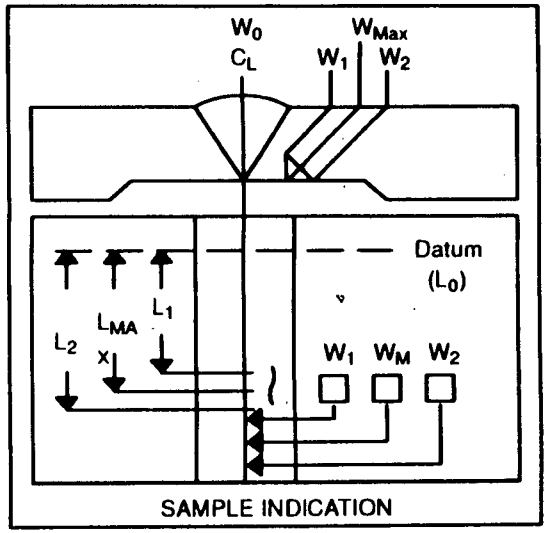
SEARCH UNIT ANGLE 60 ° W_0 LOCATION ℄ of Weld L_0 LOCATION TDC



SAMPLE INDICATION

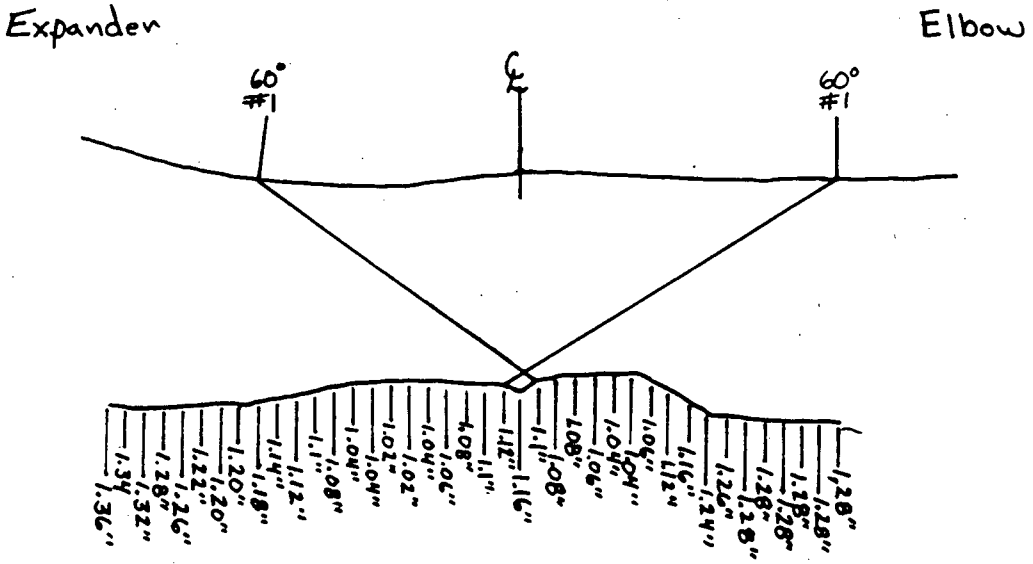
MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	100%	1.6"	2.0"	N/A	N/A	N/A	N/A	*	7" CCW	*	N/A	Elbow Facing W2	* Seen 360° Intermittant at Varying Amplitudes - Root Geometry. Verified with a 0° ID Profile and Beam Plot.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	[signature]	LEVEL III	DATE 9/25/93
	2	David W Mantz	LEVEL II	DATE 9/25/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-1-93
	2	[signature]	LEVEL N/A	DATE 10/9/93
	3	[signature]	LEVEL ASNT	DATE 10/12/93

Weld#2


Expander
Elbow
60° #1
℄
60° #1
1.36"
1.34"
1.32"
1.28"
1.26"
1.22"
1.20"
1.20"
1.18"
1.14"
1.12"
1.1"
1.08"
1.04"
1.04"
1.02"
1.02"
1.04"
1.06"
1.08"
1.1"
1.12"
1.16"
1.1"
1.08"
1.08"
1.06"
1.04"
1.04"
1.06"
1.12"
1.16"
1.24"
1.26"
1.28"
1.28"
1.28"
1.28"

9/25/95

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #2

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.18 Delay 7.92
Range .5"
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity 42 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. 80C3613E
"T" .1"-1.0" Dia. N/A
Temperature 75 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .2"
Remarks CAL. FOR THICKNESS PROFILE ONLY.

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

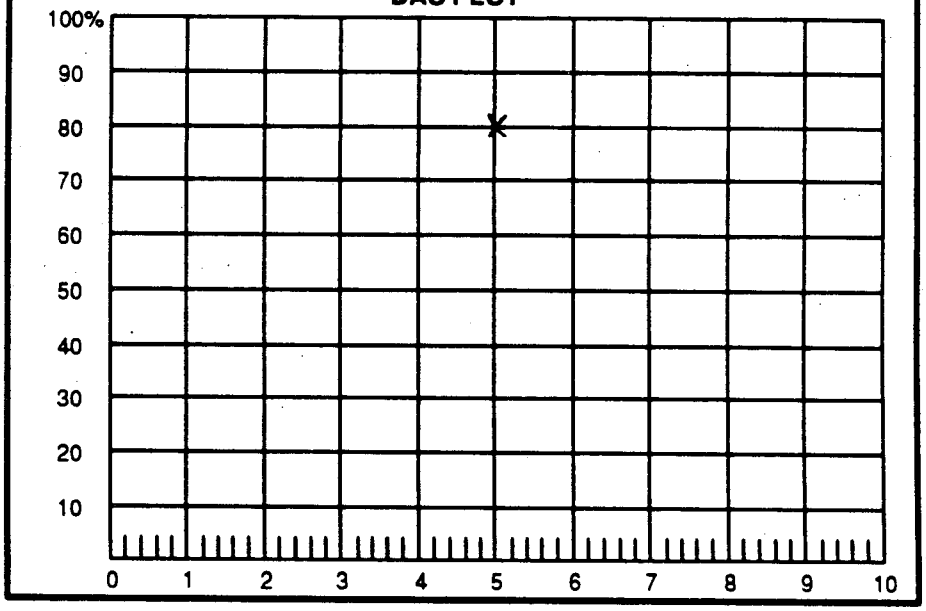
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0915
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1255

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/24/93
2 [signature] LEVEL II DATE 9/24/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL AN II DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. O
CHANGE NO. N/A

CPL-215 WELD #2

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.07 Delay 9.83
Range .5"
Gain (coarse) 20 dB
Gain (fine) 36 dB
Reference Sensitivity 56 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-215 WELD #1
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

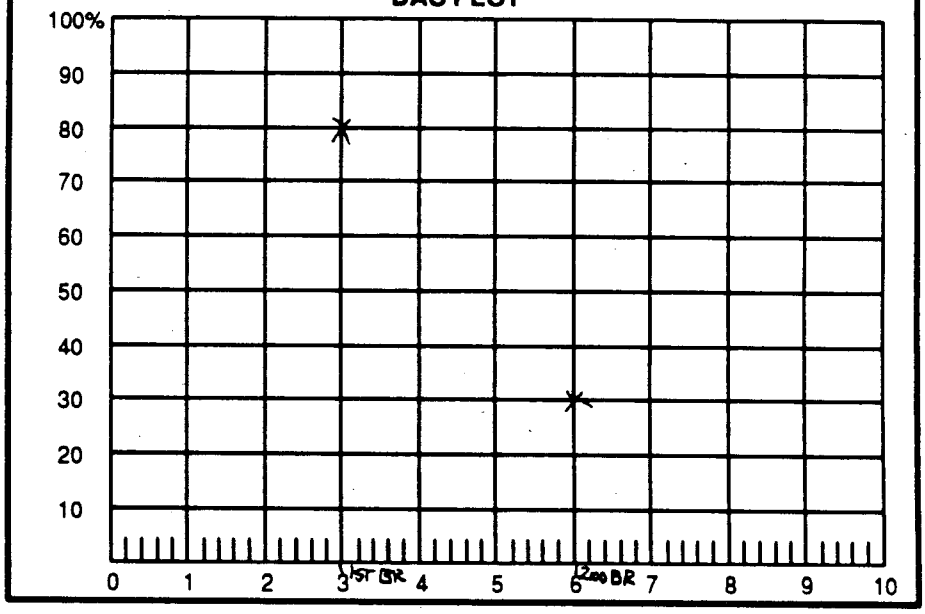
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0817
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	0855

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/24/93
2 [signature] LEVEL II DATE 9/24/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #2

INSTRUMENT

Model USM-7
Serial No. 27276-749
Sweep Length 4.90 Delay 7.60
Range 2.5"
Gain (coarse) 10 / = 0 dB
Gain (fine) 22 / = 30 dB
Reference Sensitivity 22 / = 30 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-174
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

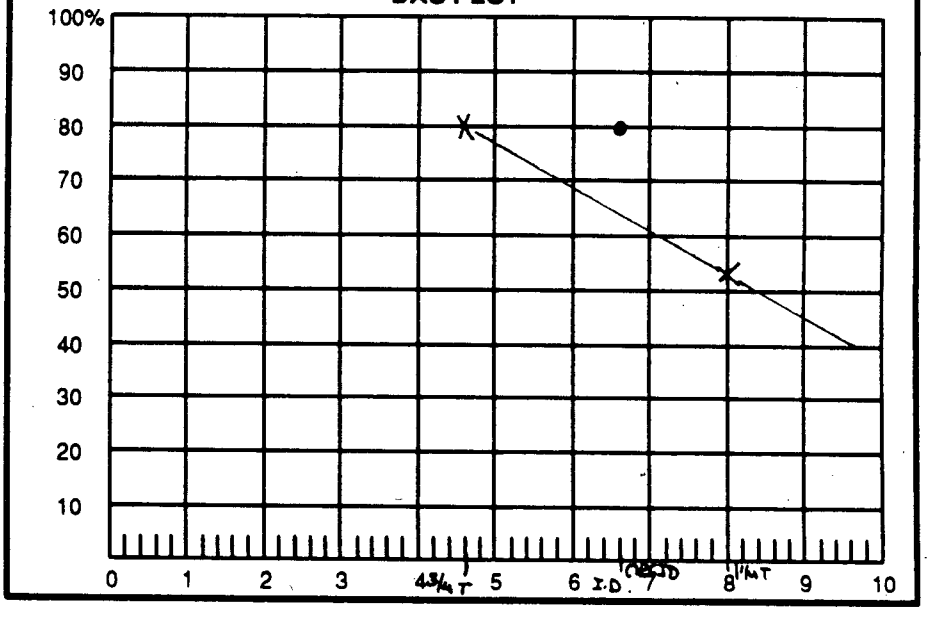
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0825
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1250

REMARKS: -12 dB I.D. NOTCH TO DAC
● = CIRC. I.D. NOTCH
X = AXIAL S.O.H.

EXAMINERS 1 [signature] LEVEL III DATE 9-24-93
2 [signature] LEVEL II DATE 9-24-93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/1/93
3 [signature] LEVEL ANII DATE 10/2/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #2

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.04 Delay 7.46
Range 2.5"
Gain (coarse) ± 20 / = 20 dB
Gain (fine) ± 20 / = 20 dB
Reference Sensitivity ± 40 / = 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 95 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

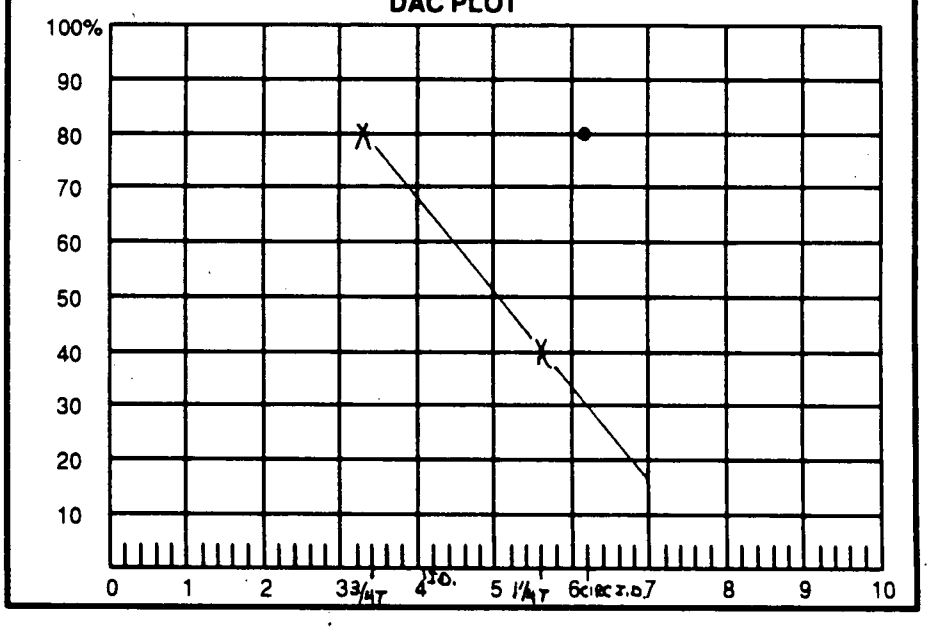
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	79
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0835
INTERMEDIATE	N
INTERMEDIATE	/
INTERMEDIATE	A
FINAL CAL.	1245

DAC PLOT



REMARKS: I.D. NOTCH FALLS AT DAC
● = CIRC. I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/24/93
	2	[signature]	LEVEL	II	DATE 9/24/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-1-93
	2	[signature]	LEVEL	N/A	DATE 10/9/93
	3	[signature]	LEVEL	ANII	DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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EXAM ITEM
Weld#2 CPL-215

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld#2 FW
ISO/DWG. NO. CPL 215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 °F

SCAN 0 ° SCAN dB 62				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides
Examined 2.5T/360° Both Sides of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 LEVEL III DATE 9/24/93
2 David M Martin LEVEL II DATE 9/24/93

REVIEWERS:
1 LEVEL II DATE 10-1-93
2 Richard A. Weber LEVEL N/A DATE 10/2/93
3 R Valladares LEVEL ANII DATE 10/2/93

NES 9/90 – REV. 1
NES NUCLEAR ENERGY SERVICES, INC.

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EXAM ITEM
CPL-215 Weld #2

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #2 FW
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Reducer Side
Examined 2.5T/360° Expander Side of Weld for Long Seam Coverage
No Long Seam Visible

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Reducer Side
Examined 2.5T/360° Expander Side of Weld for Long Seam Coverage
No Long Seam Visible

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/24/93
2 David M Monta LEVEL II DATE 9/24/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL II DATE 10/12/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
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EXAM ITEM
CPL-215 Weld #2

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #2 FW
ISO/DWG. NO. CPL 215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Reducer Side
Examined 2.5T/360° Reducer Side of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Reducer Side
Examined 2.5T/360° Reducer Side of Weld for Long Seam Coverage
No Long Seams Visible

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/24/93
2 David M Martin LEVEL II DATE 9/24/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

EXAM ITEM

Weld*2

ISO/DWG. NO.

CPL-215

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-002

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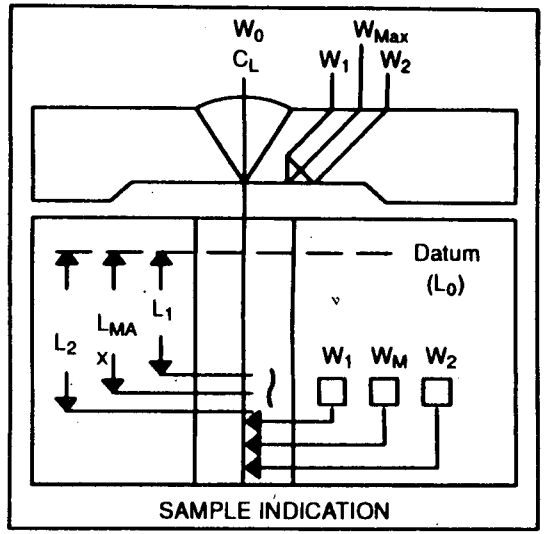


SAMPLE INDICATION

SEARCH UNIT ANGLE 60° ° W_0 LOCATION ℄ of Weld L_0 LOCATION TDC

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind.	%	W	MAX	FWD 50%	FWD DAC*	BACKWARD 50%	BACKWARD DAC*	L_1	L	L_2	RBR	S.U.	REMARKS
No.	of DAC*	W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	50%	1.4"	1.85"	N/A	N/A	N/A	N/A	*	15"CW	*	N/A	Expansion Fixing W*2	*Seen 360° Intermittant at Varying Amplitudes - Root Geometry. Verified with a 0° ID Profile and Beam Plot.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 _____ LEVEL III DATE 9/24/93

2 _____ LEVEL II DATE 9/24/93

REVIEWERS 1 _____ LEVEL III DATE 10-6-93

2 _____ LEVEL N/A DATE 10/9/93

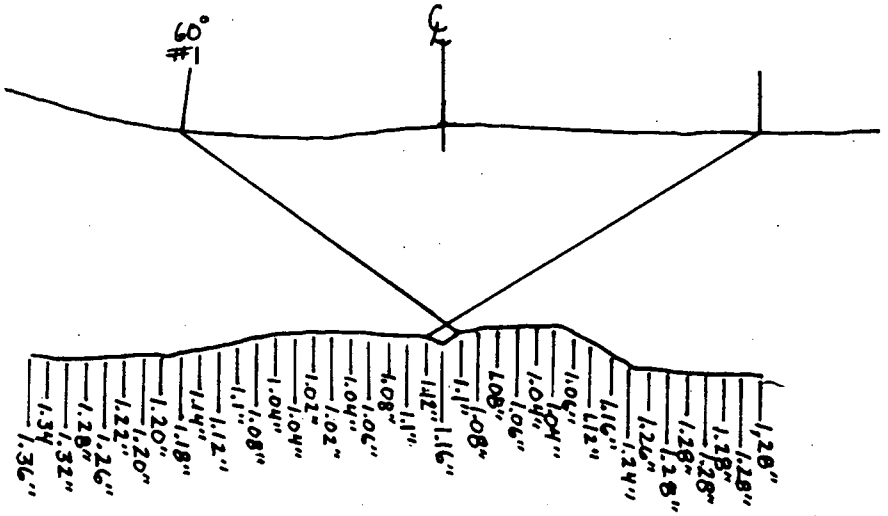
3 _____ LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

Weld #2

Expander

Elbow



LTH 9/24/93

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL 215
BASE METAL - ELBOW

INSTRUMENT

Model USK-7
Serial No. 27276.749
Sweep Length 4.88 Delay 7.56
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 12 / 8 ± dB
Reference Sensitivity = 32 / 28 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010" Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

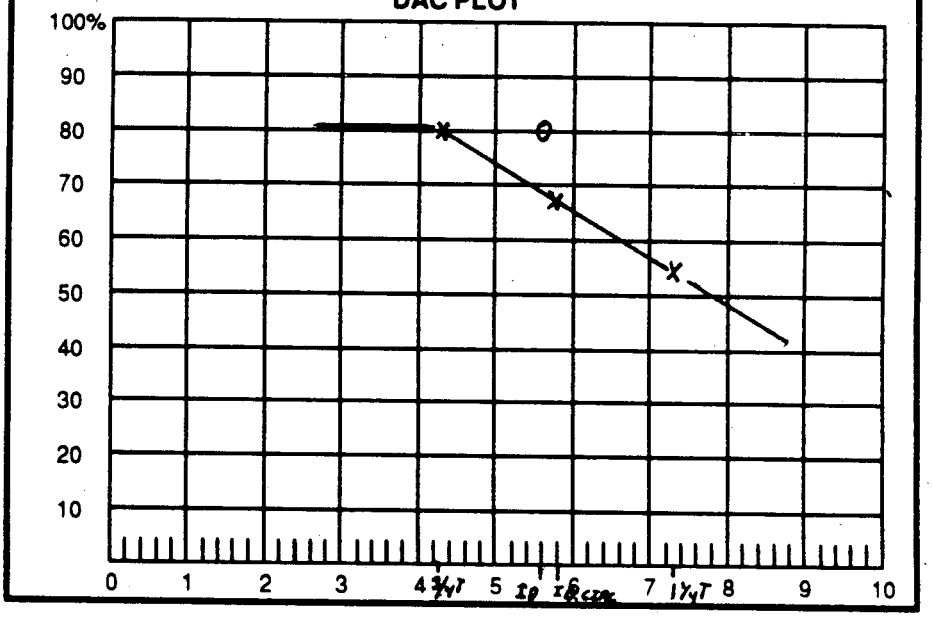
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1430
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1915

REMARKS: -12dB TO BRING I.D. NOTCH TO DAC
O = CIRC. I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS	1	Scott Lamm	LEVEL	III	DATE 9-24-93
	2	Steve Wollum	LEVEL	I	DATE 9-24-93
REVIEWERS	1		LEVEL	III	DATE 10/2/93
	2		LEVEL	N/A	DATE 10/9/93
	3	R Palladino	LEVEL	AN II	DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM FW
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM

BASE METAL-ELBOW

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

SCANNED HALF-WAY DOWN ELBOW FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

SCANNED HALF-WAY DOWN ELBOW FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

EXAMINERS:
1 Scott Lawn LEVEL III DATE 9-24-93
2 Steve Wollum LEVEL I DATE 9-27-93 9-21-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/2/93
2 Richard A Usher LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

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PAGE 30 OF 53
CPL 215
2+25T LS.

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276749
Sweep Length 4.88 Delay 7.56
Range 2.5"
Gain (coarse) = 20 / 20 ⊥ dB
Gain (fine) = 12 / 8 ⊥ dB
Reference Sensitivity = 32 / 28 ⊥ dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010" Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

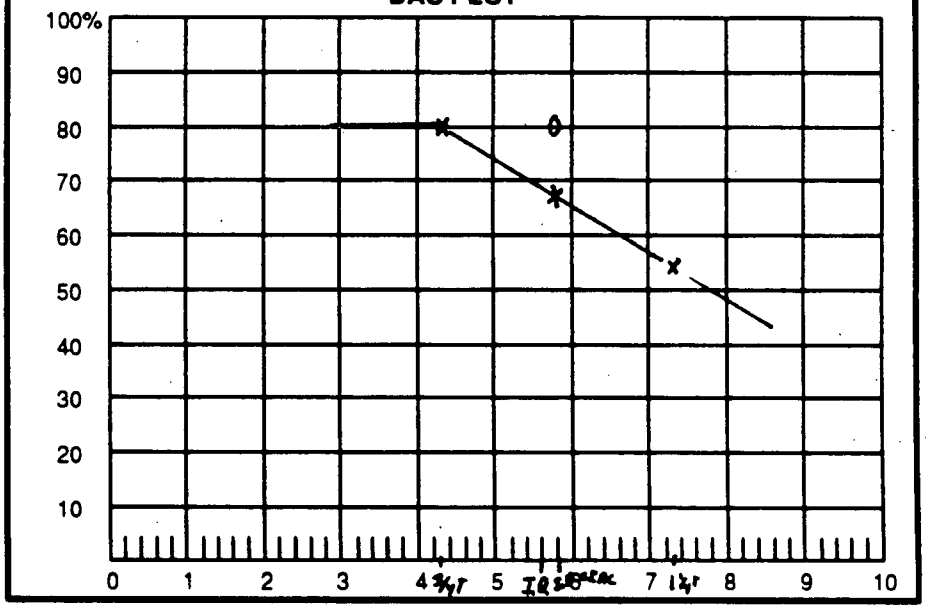
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1430
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1915

REMARKS: -12dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS	1	Scott Lowe	LEVEL	III	DATE 9-24-93
	2	Steve Williams	LEVEL	I	DATE 9-24-93
REVIEWERS	1	[signature]	LEVEL	III	DATE 9/24/93
	2	Richard A. Weber	LEVEL	S/A	DATE 10/9/93
	3	R Valladares	LEVEL	ANII	DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM FW
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM: 2 + 2.5T L.S.

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: GEOMETRIC INDICATIONS DETECTED AT LESS THEN RECORDABLE AMPLITUDES. EXAMINED 2.5T/360° ELBOW SIDE OF WELD FOR LONG. SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: EXAMINED 2.5T/360° ELBOW SIDE OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 [signature] LEVEL III DATE 9-24-93
2 Steve Welburn LEVEL I DATE 9-27-93 9-27-93 9-24-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/2/93
2 [signature] LEVEL S/A DATE 10/9/93
3 RP Valladares LEVEL AU II DATE 10/12/93

EXAM ITEM: WELD 2

ISO/DWG. NO.: CPL-215

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-009

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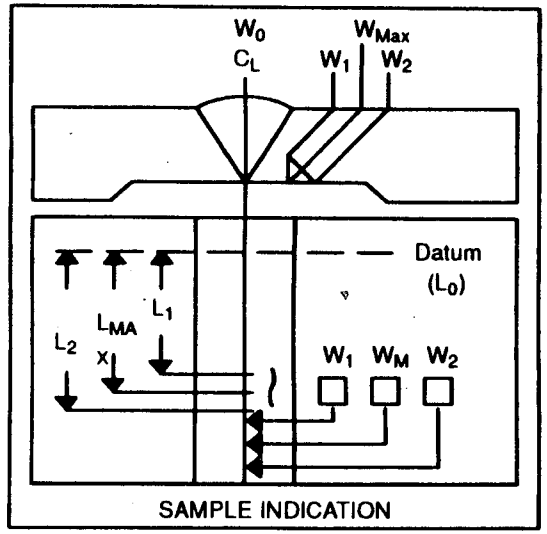
SEARCH UNIT ANGLE 45 ° W_0 LOCATION WELD ℄ L_0 LOCATION T.D.C.



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	45	.9	1.45	N/A	N/A	N/A	N/A	N/A	1" CW	N/A	N/A	U.S.	360° INTERMITTENT
						N		A					

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Scott Lam LEVEL III DATE 9-24-93

2 Steve Wolyn LEVEL I DATE 9-27-93 SW 9-27-93

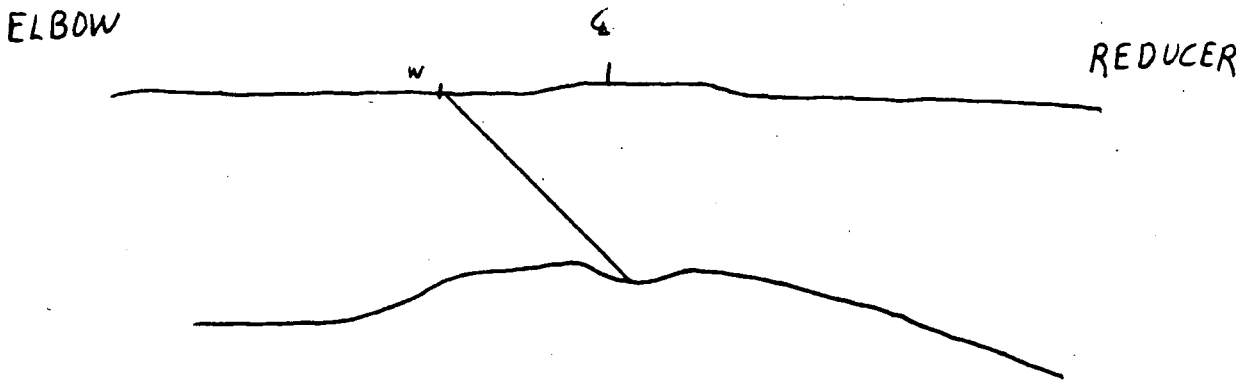
REVIEWERS 1 [signature] LEVEL III DATE 9-24-93 10/2/93

2 [signature] LEVEL N/A DATE 10/9/93

3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

CPL-215
WELD 2



EXAMINER Scott Lam LEVEL III DATE 9-24-93

EXAMINER Steve Wollum LEVEL I DATE ~~9-27-93~~ SW 9-27-93
9-24-93

DATA SHEET NO. 1223-009
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-215 ELBOW BASE MATERIAL

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.05 Delay 7.52
Range 2.5"
Gain (coarse) 120/=20 dB
Gain (fine) 122/=24 dB
Reference Sensitivity 142/44 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010 Dia. 16"
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

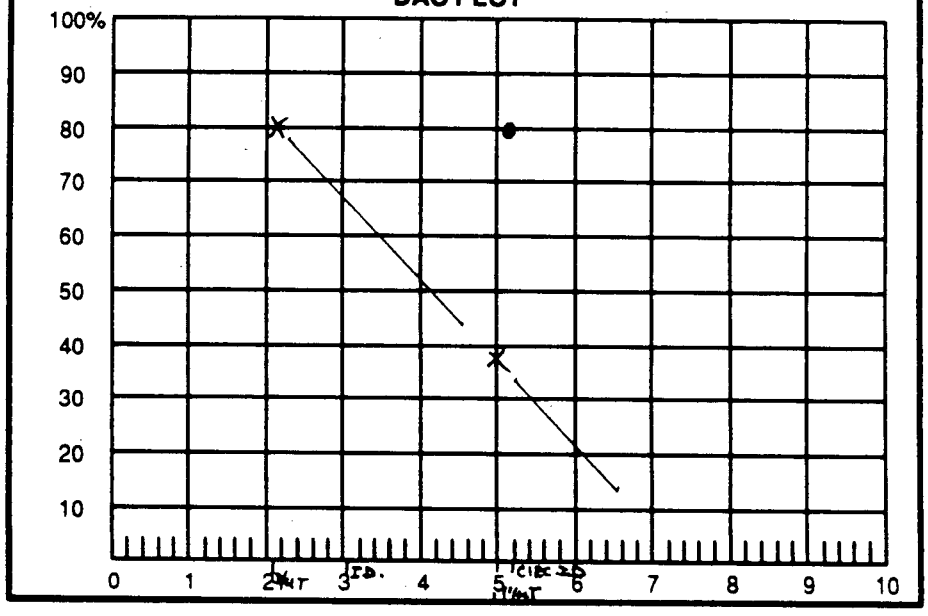
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	78
20	+12	76

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0824
INTERMEDIATE	1046
INTERMEDIATE	1300
INTERMEDIATE	N/A
FINAL CAL.	1530

REMARKS: I.D. NOTCH FALLS AT DAC
● = CIRC. I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/25/93
	2	[signature]	LEVEL	II	DATE 9/25/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-1-93
	2	[signature]	LEVEL	N/A	DATE 10/9/93
	3	[signature]	LEVEL	ANII	DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 4" BASE MTL. F/W
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
"A" S/G F.W. ELBOW BASE MATERIAL EXAM

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED DOWNSTREAM HALF OF ELBOW FOR THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED DOWNSTREAM HALF OF ELBOW FOR THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/25/93
2 David M Martin LEVEL II DATE 9/25/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 Richard B Gruber LEVEL N/A DATE 10/9/93
3 [signature] LEVEL III DATE 10/12/93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-009
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-749
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: B05236
Frequency: 2.25 Mhz
Size: .5 x .5
Manufacturer: AEROTECH

SIMULATOR BLOCK

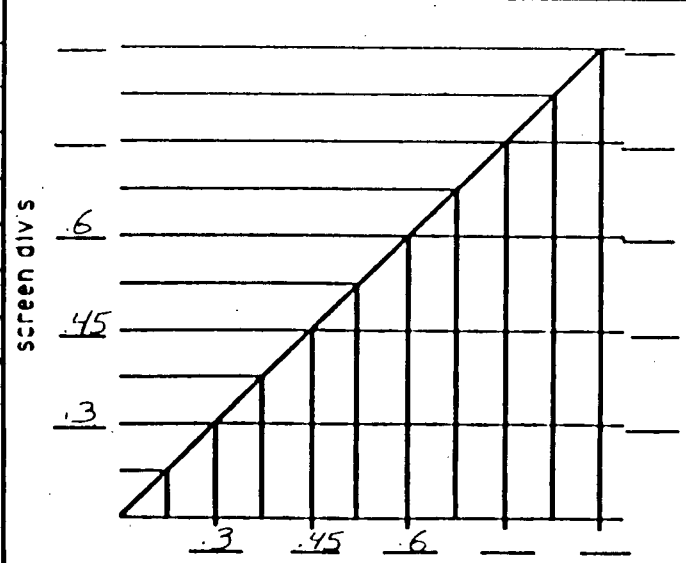
ID:
Reflector Type:
CE-2: ____ Div's N/A
Pulse Separation: ____ Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/Fine	12	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: ____ Div's

Measured Beam Angle 45 deg.

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

Remarks: CPL-215 WELD #2

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	II	10-1-93	[signature] 10/9/93	10/12/93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-008
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Mantas	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:

Type: N/A

Material:

Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog

Model: USK-7

Serial No: 27276-807

Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒

Serial No: 2211-93001

Frequency: Mhz

Size: 2 (25mm x 12mm)

Manufacturer: SIGMA

SIMULATOR BLOCK

ID:

Reflector Type: N/A

CE-2: Div's

Pulse Separation: Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	6.70	
Mat'l Cal	7.90	N/A
Frequency	FIXED	
Gain/Coarse	20	
Gain/Fine	34	
Filter	FIXED	

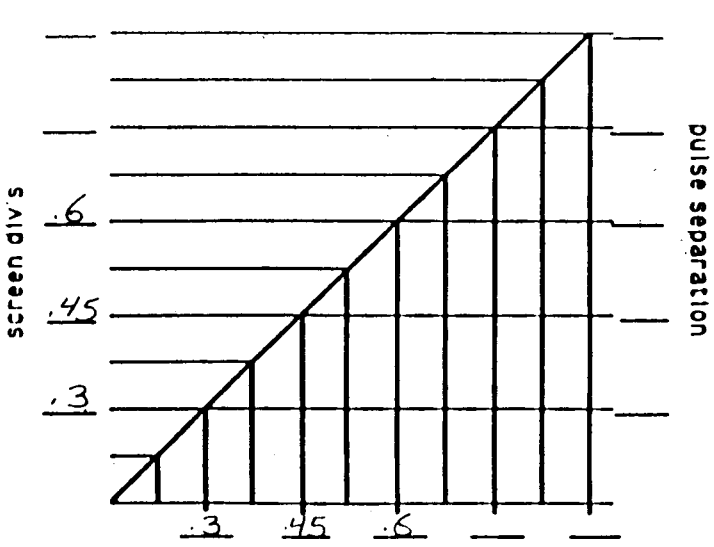
Pulse/Echo ☐

Thru trans ☒

Jack Used: T ✓ /R ✓

Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:

shear: ☐

longitudinal: ☒

bi-modal: ☐

Type Reflector

holes: ☐

notches: ☒

☐ PATT

☒ HALT

☐ MOST

☐ SPOT

☐ 30-70-70

Measured Beam Angle 60 deg.

CE-2: Div's

CABLES

RG62 ☒

RG58 ☐

RG174 ☐

Length: 6'

Initial Calibration Time: 1030

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

remarks CPL-215 WELD #2

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	II	10-1-93	RBW 10/6/93 RP Valladares	10/12/93

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld*2 FW
ISO/DWG. NO. CPL 215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 °F

EXAM ITEM: Weld*2

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 [signature] LEVEL II DATE 9/30/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 9/9/93
3 [signature] LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223 009
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #4

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.6 Delay 7.9
Range .5"
Gain (coarse) 20 dB
Gain (fine) 30 dB
Reference Sensitivity 50 dB
Remarks: N/A

SEARCH UNIT

Serial No. 428181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. 80C3613E
"T" .1"-1.0" Dia. N/A
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .2"
Remarks PROFILE THICKNESS ONLY

COUPLANT

Brand ULTRAGEL II
Batch No. 09.3001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

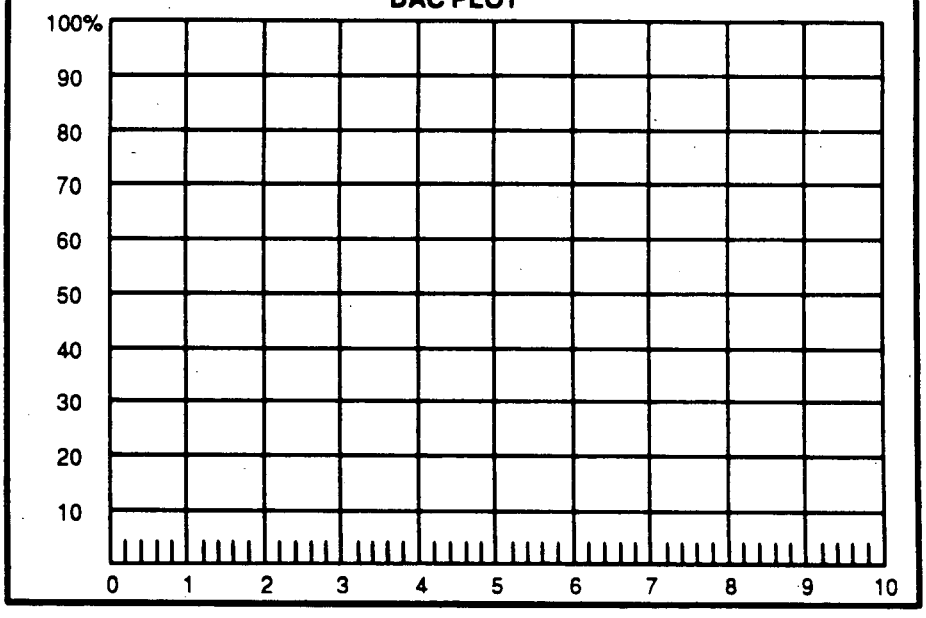
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1305
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1455

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/25/93
2 [signature] LEVEL II DATE 9/25/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL AWS II DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #4

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.05 Delay 7.52
Range 2.5"
Gain (coarse) +20 / = 20 dB
Gain (fine) +22 / = 24 dB
Reference Sensitivity +42 / = 44 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-54
"T" 1.010 Dia. 16"
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

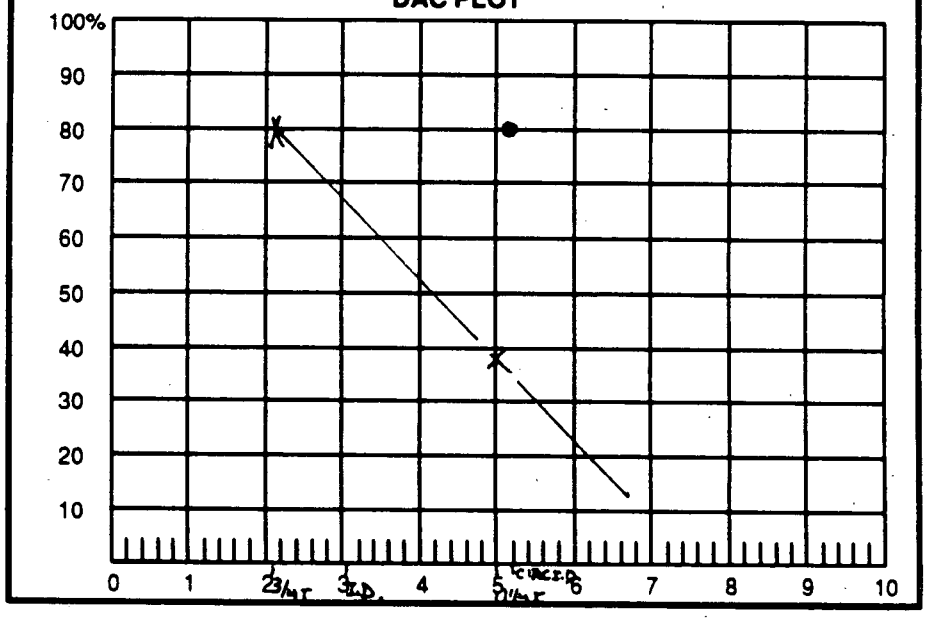
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	78
20	+12	76

CAL. CHECKS

	TIME
INITIAL CAL.	0824
INTERMEDIATE	1046
INTERMEDIATE	1300
INTERMEDIATE	N/A
FINAL CAL.	1530

DAC PLOT



REMARKS: I.D. NOTCH FALLS AT DAC
● = CIRC. I.D. NOTCH
X = AXIAL SDH.

EXAMINERS 1 [signature] LEVEL III DATE 9/25/93
2 [signature] LEVEL II DATE 9/25/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD #4 F/W
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 95 ° F

EXAM ITEM
CPL-215 WELD #4

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: PIPE TO ELBOW. COMPLETE BOTH SIDES.
Examined 2.5T/360° Both Sides of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: PIPE TO ELBOW. COMPLETE BOTH SIDES.
Examined 2.5T/360° Both Sides of Weld for Long Seam Coverage.
No Long Seams Visible

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 _____ LEVEL III DATE 9/25/93
2 David M Montes LEVEL II DATE 9/25/93

REVIEWERS:
1 _____ LEVEL III DATE 10-4-93
2 _____ LEVEL N/A DATE 10/9/93
3 _____ LEVEL ANII DATE 10/12/93

Gen A"

EXAM ITEM: WELD #4

ISO/DWG. NO.: CPL-215

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-009
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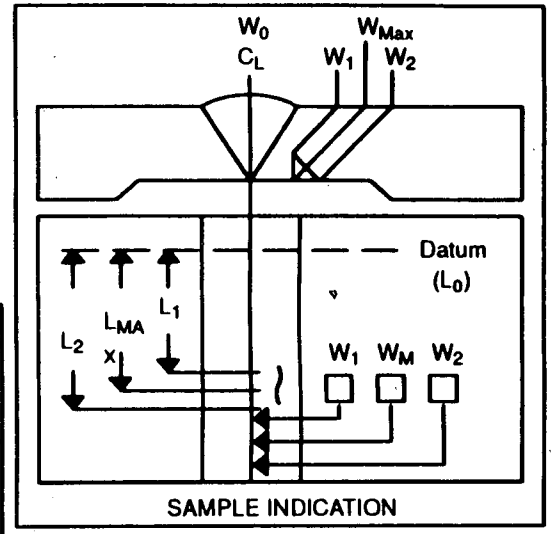
SEARCH UNIT ANGLE 60 ° W_0 LOCATION Ł of Weld L_0 LOCATION Intrados of Elbow



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

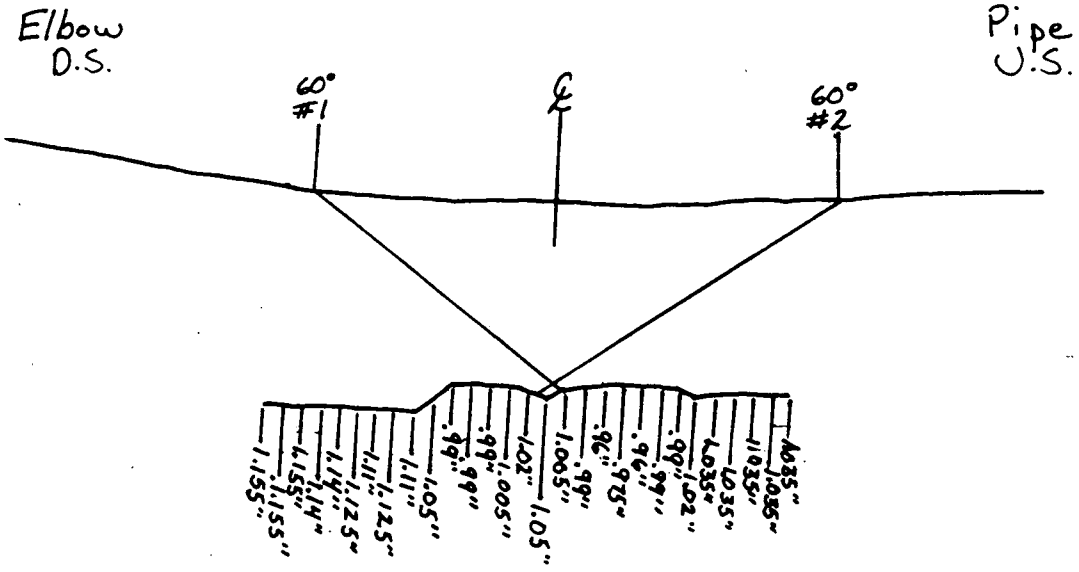
Ind. No.	% of DAC*	W	MAX	FWD 50% DAC*		BACKWARD 50% DAC*		L_1	L	L_2	RBR	S.U.	REMARKS
		W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	50%	1.3"	1.7"	N/A	N/A	N/A	N/A	*	2.25"CCW	*	N/A	DS.	* Seen 360° Intermittant at Varying Amplitudes - Root Geometry. Verified with a 0° ID Profile and Beam Plots.
2	40%	1.5"	1.9"	N/A	N/A	N/A	N/A	*	2.25"CCW	*	N/A	US.	

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	[signature]	LEVEL III	DATE 9/25/93
	2	[signature]	LEVEL II	DATE 9/25/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-1-93
	2	[signature]	LEVEL N/A	DATE 10/9/93
	3	[signature]	LEVEL AWII	DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

Weld#4


Elbow
O.S.
Pipe
U.S.
60°
#1
℄
60°
#2
1.035"
1.035"
1.035"
1.02"
.99"
.96"
.925"
.99"
1.005"
1.05"
1.02"
1.005"
.99"
.99"
1.05"
1.11"
1.11"
1.125"
1.14"
1.155"
1.155"

9/25/93

DATA SHEET NO. 1223-009
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL 215 Weld 4

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 9.34 Delay 8
Range 5W 9-21-93 3" 2.5"
Gain (coarse) 20 dB
Gain (fine) 24 dB
Reference Sensitivity 44 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5 MHz
Mode LONG
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF-CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT
"T" .87" Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .3"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

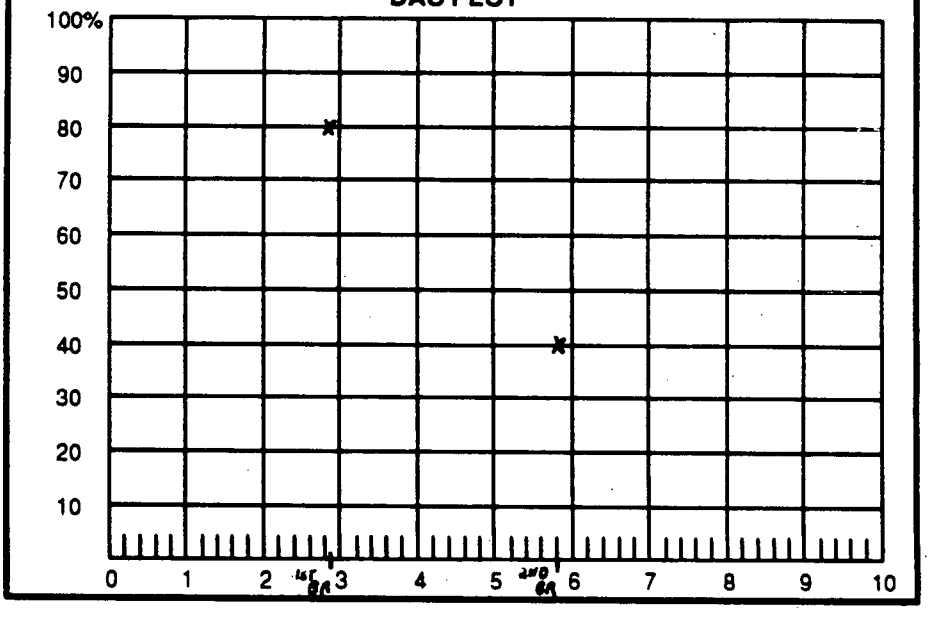
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1510
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1550

REMARKS:

EXAMINERS
1 Scott Lam LEVEL III DATE 9-24-93
2 Steve Wollyn LEVEL I DATE 9-27-93 SW 9-24-93

REVIEWERS
1 Scott Lam LEVEL III DATE 10-1-93
2 [signature] LEVEL III DATE 10/2/93
3 [signature] LEVEL N/A DATE 10/9/93
A Palladares ANII 10/12/93

DATA SHEET NO. 1223-009
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EXAM ITEM
4 + 2.5T L.S.

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM FW
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 °F

SCAN 0 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

EXAMINERS:
1 Scott LEVEL III DATE 9-24-93
2 Steve Wolkum LEVEL I DATE 9-24-93

REVIEWERS:
1 LEVEL III DATE 10/2/93
2 LEVEL N/A DATE 10/9/93
3 LEVEL ANII DATE 10/12/93

NES 9/90 – REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL 215
4 + 25T L.S.

INSTRUMENT

Model USK-7
Serial No. 27276.749
Sweep Length 4.88 Delay 7.56
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 12 / 8 ± dB
Reference Sensitivity = 32 / 28 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MOT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010 Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

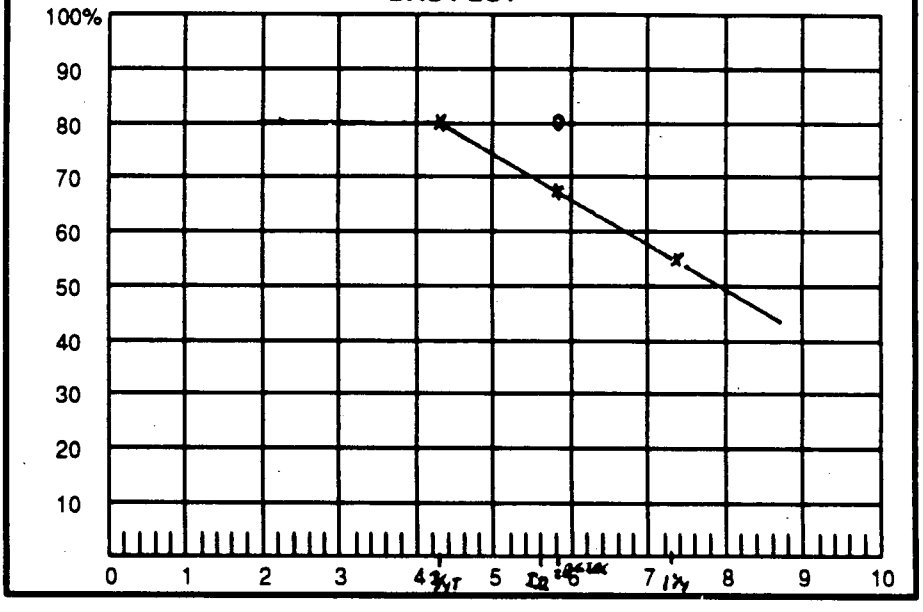
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1430
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1915

DAC PLOT



REMARKS: -12dB TO BRING I.D. NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.O.H

EXAMINERS 1 Scott Lau LEVEL III DATE 9-24-93
2 Steve Wollum LEVEL I DATE 9-27-93 9-24-93
REVIEWERS 1 [signature] LEVEL III DATE 9-24-93 10/2/93
2 Richard B. Weber LEVEL N/A DATE 10/2/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-009
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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM FW
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM

4 + 2.5T L.S.

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: GEOMETRIC INDICATIONS DETECTED AT LESS THEN RECORDABLE AMPLITUDES. EXAMINED 2.5T/360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: EXAMINED 2.5 T/360° BOTH SIDES OF WELD FOR LONG SEAM COVERAGE. NO LONG SEAMS VISIBLE.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 Scott Lowe LEVEL III DATE 9-24-93
2 Steve Wollum LEVEL I DATE 9-27-93 9-24-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/2/93
2 Richard A. Weber LEVEL N/A DATE 10/9/93
3 C. Palladino LEVEL ANII DATE 10/15/93

EXAM ITEM

WELD 4

ISO/DWG. NO.

CPL-215

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-008

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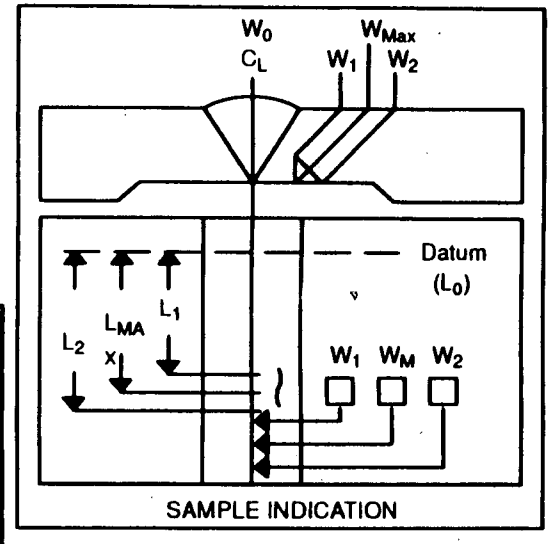
SEARCH UNIT ANGLE 45 ° W_0 LOCATION WELD Q L_0 LOCATION EXTRADOS OF ELBOW



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX	FWD 50% DAC*		BACKWARD 50% DAC*		L_1	L	L_2	RBR	S.U.	REMARKS
		W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	30%	1.7	1.45	N/A	N/A	N/A	N/A	N/A	9½" CW	N/A	N/A	D.S.	360° INTERMITTENT
2	40%	2.65	1.7	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	D.S.	360° INTERMITTENT
								N	A				

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Scott Lamm LEVEL III DATE 9-24-93

2 Steve Wollum LEVEL I DATE ~~9-27-93~~ 9-27-93

REVIEWERS 1 [signature] LEVEL III DATE ~~9-24-93~~ 10/2/93

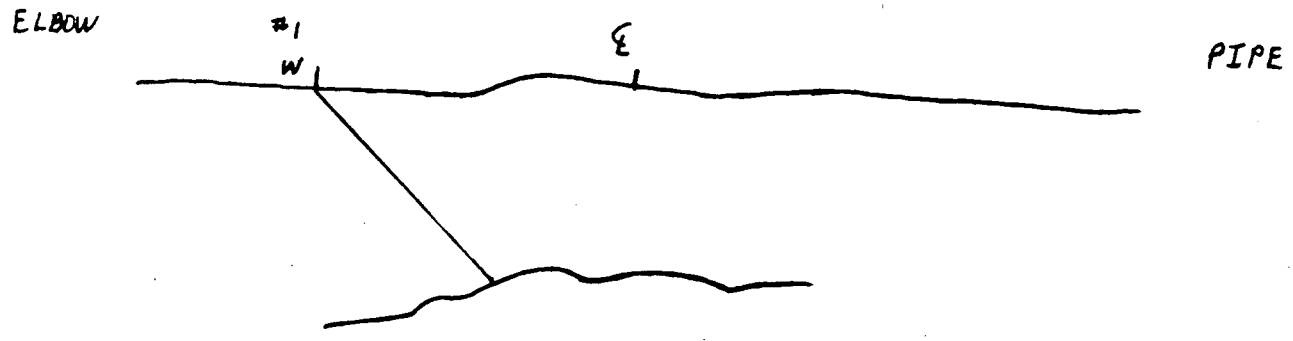
2 Milton D. Weber LEVEL N/A DATE 10/9/93

3 [signature] LEVEL Level III DATE 10/12/93

NES 9/90

NUCLEAR ENERGY SERVICES, INC.

1223-009
CPL-215
WELD 4



EXAMINER Scott Lowe LEVEL III DATE 9-24-93

EXAMINER Steve Wollum LEVEL I DATE ~~9-27-93~~ SW 9-27-93
9-24-93

CPL-215
WELD 4

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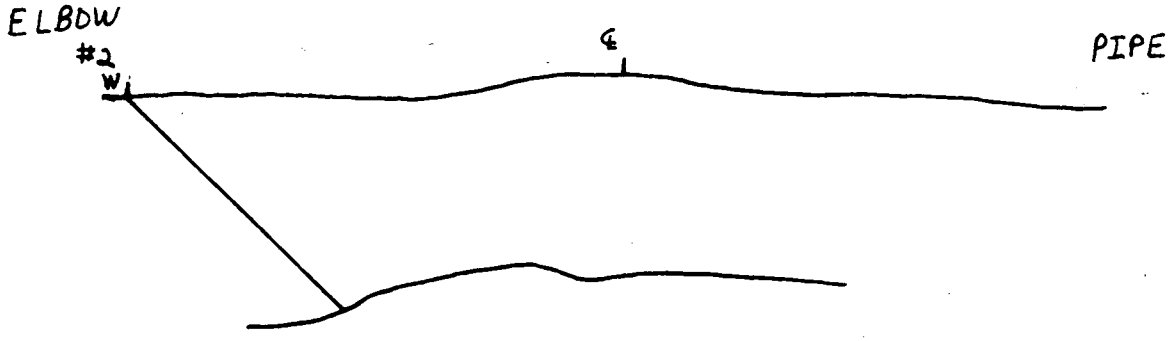


EXAMINER Scott Lamm LEVEL III DATE 9-24-93

EXAMINER Steve Wallum LEVEL I DATE ~~9-27-93~~ 9-24-93 SW 9-27-93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-009
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David L Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-749
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: B05236
Frequency: 2.25 Mhz
Size: .5 x .5
Manufacturer: AEROTECH

SIMULATOR BLOCK

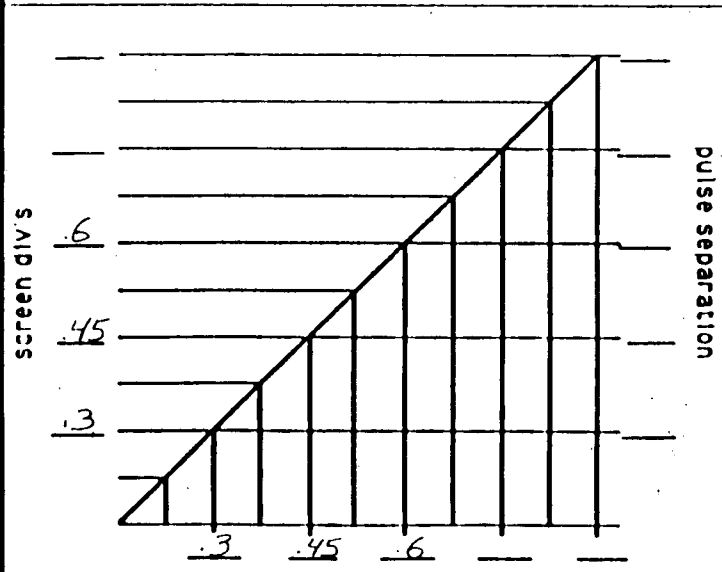
ID:
Reflector Type:
CE-2: ____ Div's N/A
Pulse Separation: ____ Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/Fine	12	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION



☐ % thru wall ☒ depth in inches

METHOD

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: ____ Div's

Measured Beam Angle 45 deg.

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

remarks CPL-215 WELD # 4

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	II	10-1-93	Rev 1 10/12 [signature]	10-12-93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-009
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David W Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK
ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT
☐ digital ☒ analog
Model: USK-7
Serial No: 27276-807
Manufacturer: KRAUTKRAMER

TRANSDUCER
Single ☐ Dual ☒
Serial No: 2211-93001
Frequency: Mhz
Size: 2 (25mm x 12mm)
Manufacturer: SIGMA

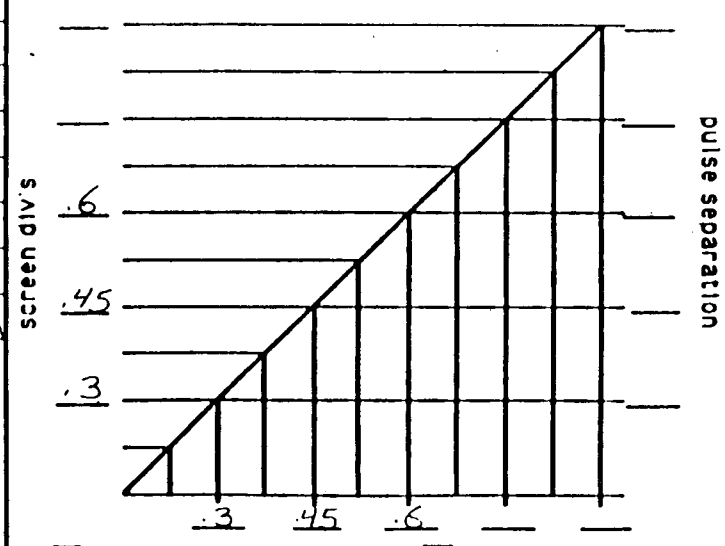
SIMULATOR BLOCK
ID:
Reflector Type: N/A
CE-2: Div's
Pulse Separation: Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	6.70	
Mat'l Cal	7.90	N/A
Frequency	FIXED	
Gain/Coarse	20	
Gain/Fine	34	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION



☐ % thru wall ☒ depth in inches

METHOD

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: Div's

Measured Beam Angle 60 deg.

CABLES
RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 10.30

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

Remarks: CPL-215 WELD # 4

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	II	10-1-93	RBW 10/9/93 [signature]	10/12/93

DATA SHEET NO. 1223-009
PAGE 53 OF 53

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #4 FW
ISO/DWG. NO. CPL215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 87 ° F

EXAM ITEM: Weld #4

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Elbow, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Elbow, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 David M Martin LEVEL II DATE 9/30/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-011
PAGE 1 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD # 14

INSTRUMENT

Model KRAUTKRAMER, USK7
Serial No. 27276-807
Sweep Length 9.67 Delay 7.82
Range 0.5"
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity 42 dB
Remarks: +6 dB SCAN
N/A

SEARCH UNIT

Serial No. M12411
Size 0.5"
Frequency 5.0 MHz
Mode LONG.
Nom. Angle 0 °
Measured Angle N/A °
Cable Type RG-174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. COMPONENT CPL-215-14
"T" 1.010 Dia. 16"
Temperature 77 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path N/A Depth ✓
Each Major Screen Div. = 0.4
Remarks 4° SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093091

VERTICAL LINEARITY

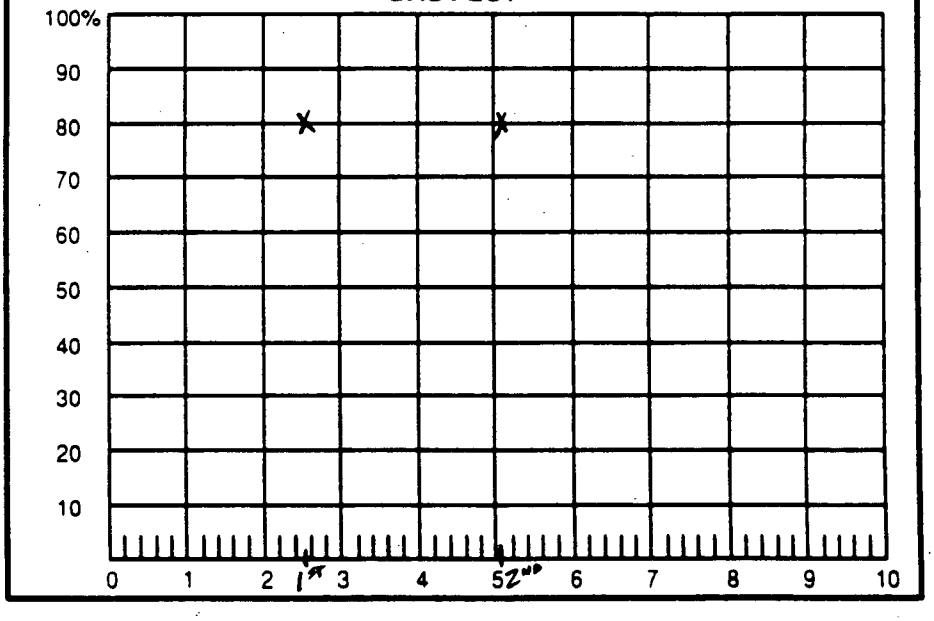
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	80
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1015
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1540

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL II DATE 10/2/93
2 [signature] LEVEL II DATE 10/2/93
REVIEWERS 1 [signature] LEVEL III DATE 10/4/93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL II DATE 10/8/93

DATA SHEET NO. 1223-011
PAGE 2 OF 7

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-215 WELD #14

INSTRUMENT

Model KRAUTKRAMER, USK7
Serial No. 27276-3784
Sweep Length 9.80 Delay 7.39
Range 0.5
Gain (coarse) T0/=0 dB
Gain (fine) T22/=28 dB
Reference Sensitivity T22/=28 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size 0.5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-174/U
Cable Length 6'
Remarks: EXIT POINT TO TIP OF WEDGE 0.4"
N/A

CALIBRATION BLOCK

No. CPL-54
"T" 1.010 Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = 0.25"
Remarks 2.5" SCREEN
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	14
4	70	35	9	20	9
5	60	30	10	10	4

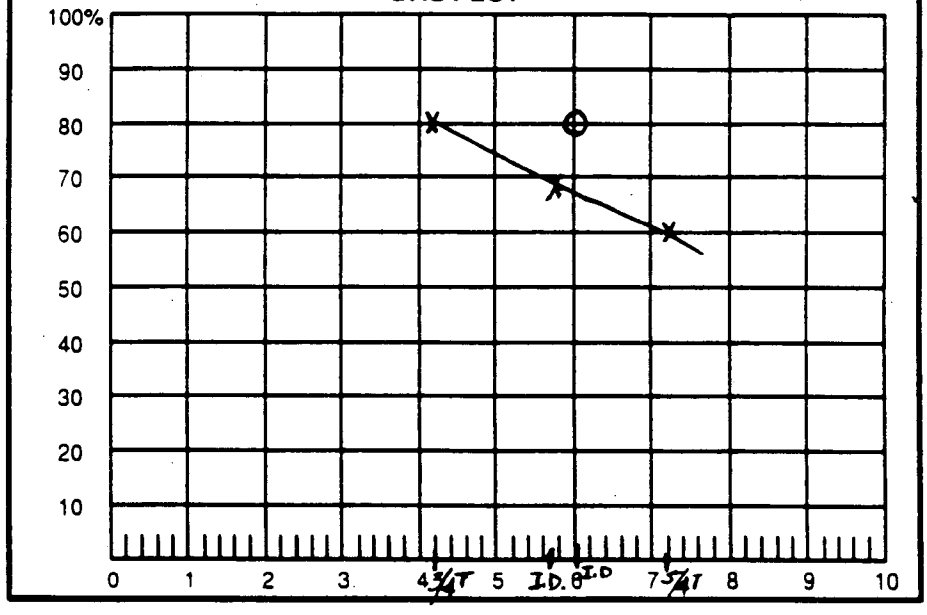
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1030
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1530

DAC PLOT



REMARKS: I.D. NOTCH -10dB TO DAC.
X = AXIAL DAC, 22dB REF.
O = CIRC. DAC, 28dB REF.
N/A

EXAMINERS 1 David M Mayton LEVEL II DATE 10/2/93
2 Benjamin Sala LEVEL II DATE 10/2/93
REVIEWERS 1 [signature] LEVEL III DATE 10/4/93
2 Sigfrido B Weber LEVEL N/A DATE 10/7/93
3 R P Wallace LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-011 SH 10-4-93

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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223

REV. 0

CHANGE NO. N/A

CPL-215 WELD #14

INSTRUMENT

Model KRAUTKRAMER, USK7

Serial No. 27276-749

Sweep Length 4.59 Delay 6.86

Range 2.5

Gain (coarse) T 40/= 40 dB

Gain (fine) T 0/= 6 dB

Reference Sensitivity T 40/=46 dB

Remarks: N/A

SEARCH UNIT

Serial No. E18404

Size 0.5"

Frequency 2.25 MHz

Mode SHEAR

Nom. Angle 60 °

Measured Angle 60 °

Cable Type RG-174/U

Cable Length 6'

Remarks: EXIT POINT TO TIP OF WEDGE 0.5"

N/A

CALIBRATION BLOCK

No. CPL-54

"T" 1.010 Dia. 16"

Temperature 90 ° F

Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓

Metal Path ✓ Depth N/A

Each Major Screen Div. = 0.5"

Remarks 5" SCREEN

N/A

COUPLANT

Brand ULTRAGEL II

Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

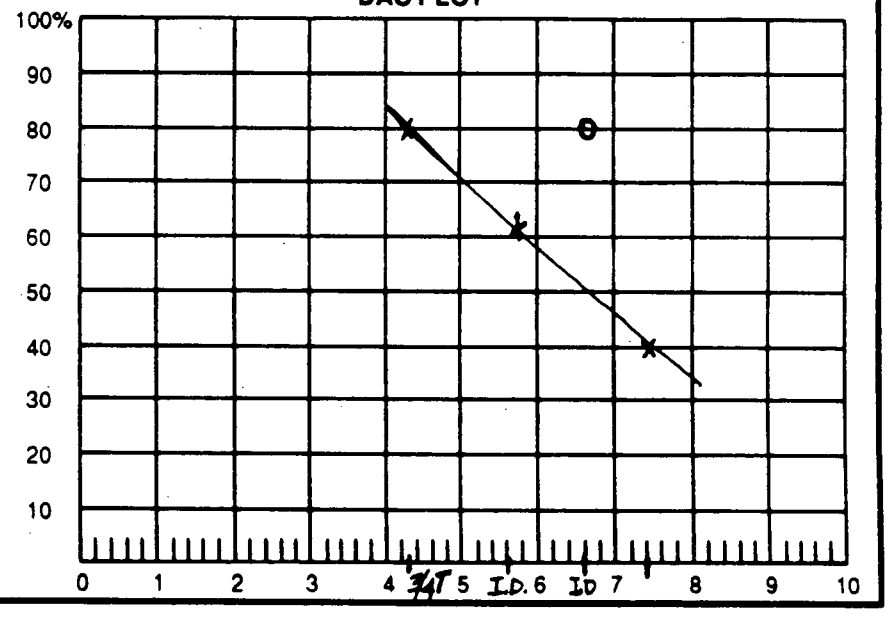
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	78
20	+12	77

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1045
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1545

DAC PLOT



REMARKS: I.D. NOTCH FELL AT DAC.
X = AXIAL DAC, 40dB REF.
O = CIRC. DAC, 46dB REF.
N/A

EXAMINERS	1	David A Mentzer	LEVEL	II	DATE 10/2/93
	2	Benjamin Smith	LEVEL	II	DATE 10/2/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10/4/93
	2	Richard B Weber	LEVEL	N/A	DATE 10/7/93
	3	[signature]	LEVEL	N/A	DATE 10/7/93

DATA SHEET NO. 1223-011
PAGE 4 OF 7
EXAM ITEM
WELD #14

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Loop A 16" FEEDWAT
ISO/DWG. NO. CA-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 77 ° F

SCAN 0 ° SCAN dB 48dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 LEVEL II DATE 10/2/93
2 LEVEL II DATE 10/2/93

REVIEWERS:
1 LEVEL III DATE 10/4/93
2 LEVEL N/A DATE 10/7/93
3 LEVEL ANII DATE 10/7/93

NES 9/90 - REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-011
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5 < 10-4-53
EXAM ITEM
CPL-215 WELD # 14

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM WELD # 14 F.W.
ISO/DWG. NO. CPL-215 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 77 ° F

SCAN 60 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: ELBOW TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2 1/2 T FOR LONG SEAM COVERAGE.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: ELBOW TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2 1/2 T FOR LONG SEAM COVERAGE.

SCAN 45 ° SCAN dB 28				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	N/A	✓	N/A	✓	N/A	✓	✓	N/A

REMARKS: ELBOW TO PIPE. FULL COVERAGE OF EXAM AREA OBTAINED WITH 60°. EXAMINED 2 1/2 T FOR LONG SEAM COVERAGE.

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: ELBOW TO PIPE. COMPLETE BOTH SIDES. EXAMINED 2 1/2 T FOR LONG SEAM COVERAGE.

EXAMINERS:
1 [signature] LEVEL II DATE 10/2/93
2 [signature] LEVEL II DATE 10/2/93

REVIEWERS:
1 [signature] LEVEL III DATE 10/4/93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL A N II DATE 10/7/93

EXAM ITEM

WELD # 14

ISO/DWG. NO.

CPL-215

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-011

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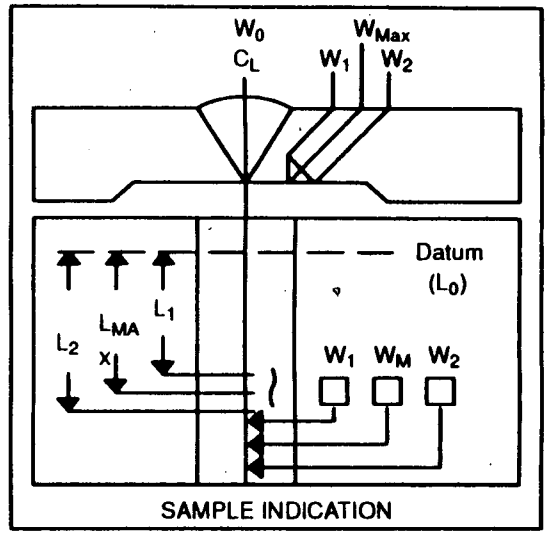
SEARCH UNIT ANGLE 60 ° W_0 LOCATION WELD ℄ L_0 LOCATION OUTSIDE RADIUS



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	50%	1.7"	2.65	N/A	N/A	N/A	N/A	N/A	43" C.W.	N/A	N/A	U.S.	I.D. GEOMETRY DUE TO BACKING
													RING. BACKING RING VERIFIED
													WITH 0°. NOTED AT VARYING
													AMPLITUDES 360° INT.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

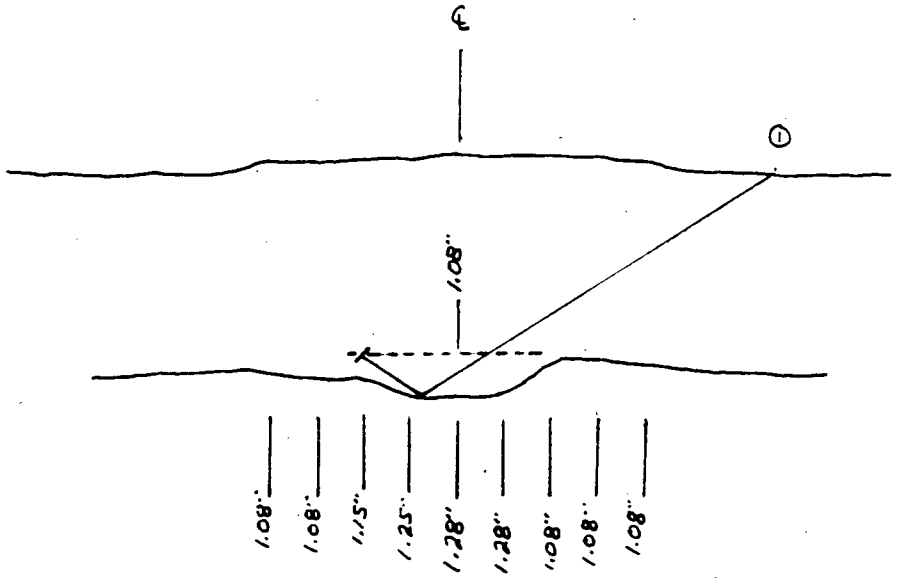
EXAMINERS	1	David M Martin	LEVEL II	DATE 10/2/93
	2	[signature]	LEVEL II	DATE 10/2/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10/4/93
	2	[signature]	LEVEL N/A	DATE 10/4/93
	3	[signature]	LEVEL ANII	DATE 10/4/93

NUCLEAR ENERGY SERVICES, INC.

CAL-215 WELD #14

1223-011
7 of 7

ELBOW SIDE FLOW → PIPE SIDE



LII 10/2/93

David M Martin LII 10/2/93

Reviewed LIII 10/4/93

SPRING HANGERS

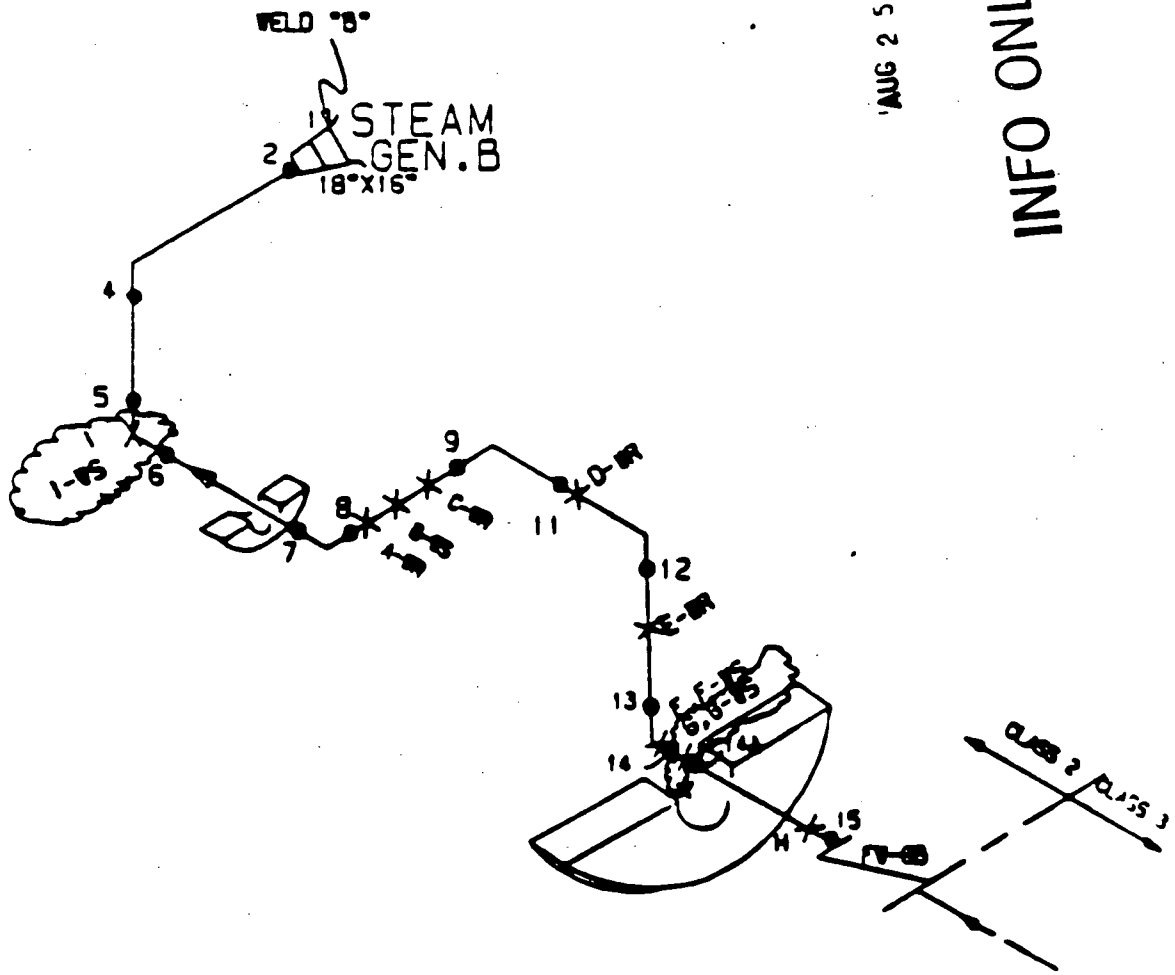
8.1

WELDED SUPPORT

G-1 8-PS

AUG 2 5 1992

INFO ONLY



CP & L Dwg. No. HBR2-10618 SH 75					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/91

CPL-216 REV.0

H.B. ROBINSON S.E. PLANT
UNIT NO. 2
DESCRIPTION: LOOP B 16" FEEDWATER
LINE NO. 16-FDW-8 | CPL- 216 REV.

CP&L

I certify that the items contained on this frame was made

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-069
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: FEEDWATER	Component Name: Support/Hanger	Component ID: 216-G
Drawing/Location: CPL-216 R/O / RX. Bldg. @ 251'-8" @ PIPE CHASE		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☒ Variable Support

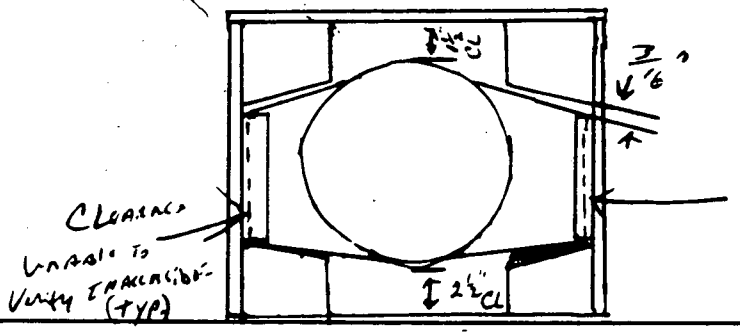
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Eugene Sing Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-EG

ISI Reviewer: Richard B Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII C Palladino 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-105
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: FW	Component Name: Variable Support	Component ID: 216-I
Drawing/Location: CPL-216-R10 / Rx. Bldg. 3rd Floor under Grating		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

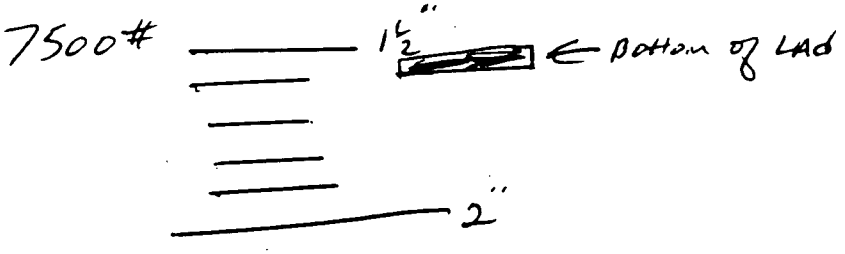
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 1.6" See Sketch		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Stone Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Wilson Date: 10/11/93

AN11 RBWallace 10/11/93

DATA SHEET NO. 1213-SL 10-10-93 014
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED FEEDWATER ISO/DWG/SK. # CPL-216 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "G"	NO INDICATIONS NOTED (SEE ATTACHED DWG.)	X	N/A
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 10-10-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-10-93
REVIEWER [signature] DATE 10/11/93
REVIEWER [signature] DATE 10/11/93

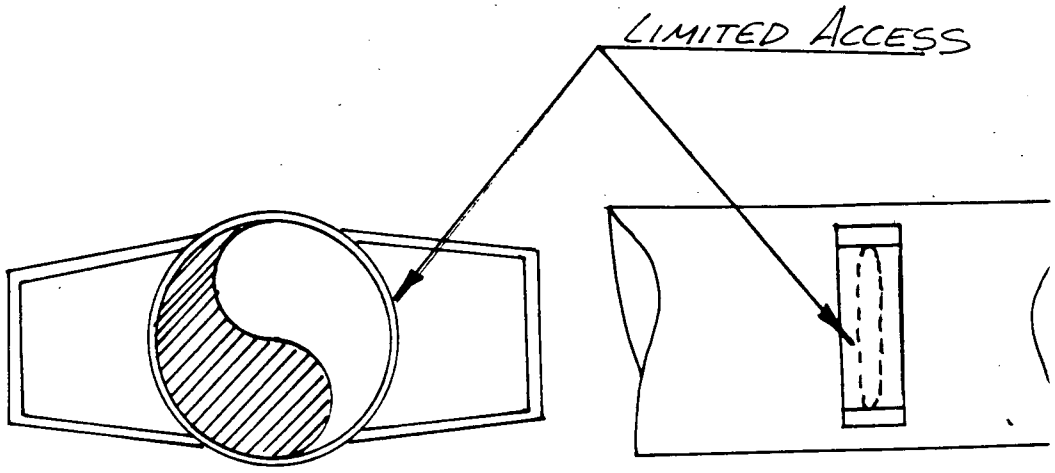
SP-1218

PAGE 2 OF 2

WELD "G" (WELDED SUPPORT)

* LIMITED EXAM DUE TO COMPONENT CONFIGURATION

* ONE DIRECTION ONLY



Kenneth L. Hamm LEVEL II 10-10-93

DATA SHEET NO. 1218-012
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL CS
CLASS 2

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED MAIN STEAM ISO/DWG/SK. # CPL-216 REVISION 0
DATUM POINT REFERENCE N/A

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES
Dry [X] Wet [N/A]
Make MAGNAFLUX
Type 8A
Batch No. 834067
Color RED

EQUIPMENT
Yoke [X] Coil [N/A] Prod [N/A]
Make PARKER
Serial No. 423
AC [X] DC [N/A]
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes [X] No [N/A]

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "I-WS"	NO INDICATIONS NOTED	Y	N/A
N/A	N/A	N/A	

EXAMINER Brad L. Dove LEVEL II DATE 10-8-93
EXAMINER [signature] LEVEL II DATE 10-8-93
REVIEWER Scott Kaye LEVEL III DATE 10-9-93
REVIEWER Richard B. Weber DATE 10/9/93
REVIEWER [signature] DATE 10/11/93

CPL 216
Base metal at Reducer/Elbow

The attached data associated with UES Data Sheet pkg. 1223-008 includes the examination of the Base metal at Reducer/Elbow. This would include examination of CPL-216-1&2. UT techniques used were as follows.

1. 45° and 60° shear wave techniques of Welds 1 and 2 and Base metal at Reducer/Elbow in the circ and axial directions.
2. 45° RL and 60° RL axial scans of welds 1 and 2 and adjacent base material for ~ 4" either side of welds. This exam was for the detection of flaw tips only.

Scott Larson LTT 10-4-93

DATA SHEET NO. 1223-008
PAGE 1 OF 24
BASE MATERIAL EXAM, REDUCER (CAL-216 WELD #1 W.R.V.) AND EXPANDER

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.18 Delay 7.92
Range .5"
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity 42 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. 80C3613E
"T" .1"-1.0" Dia. N/A
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .2"
Remarks PROFILE THICKNESS ONLY.

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

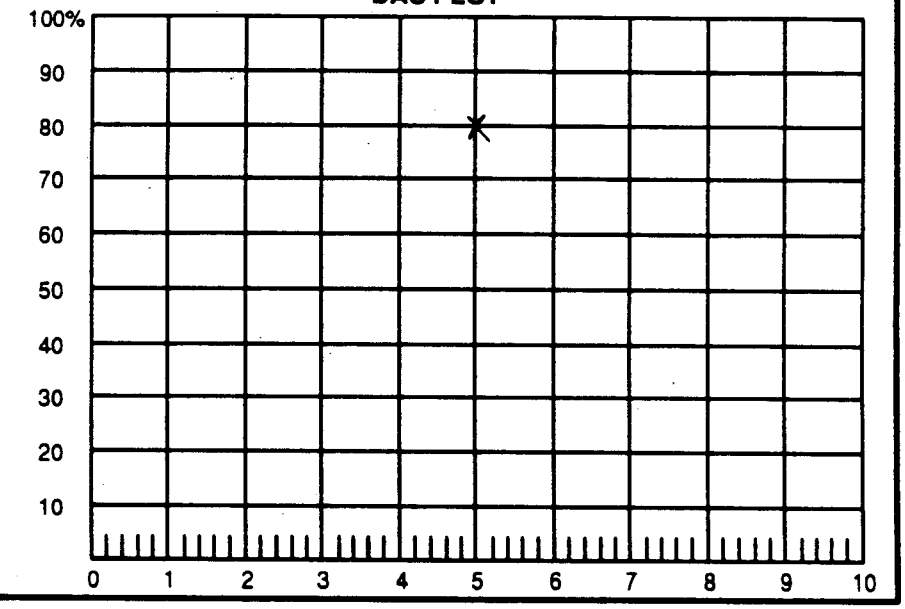
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0958
INTERMEDIATE	1216
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1845

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/23/93
2 [signature] LEVEL II DATE 9/23/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/13/93

DATA SHEET NO. 1223-003
PAGE 2 OF 24
BASE MATERIAL EXAM. REDUCER (CPL-216 WELD #1 WRV) AND EXPANDER

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USN-7
Serial No. 27276-749
Sweep Length 4.90 Delay 7.60
Range 2.5"
Gain (coarse) +0 / =0 dB
Gain (fine) +20 / =28 dB
Reference Sensitivity +20 / =28 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-174
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

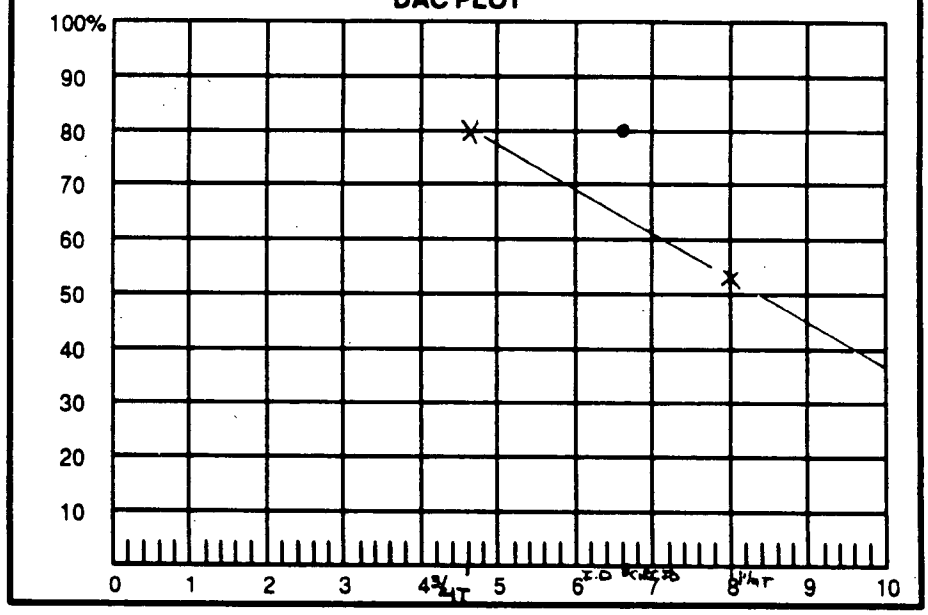
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	78
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1005
INTERMEDIATE	1215
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1845

REMARKS: -12 dB I.D. NOTCH TO DAC
● = CIRC. I.D. NOTCH
x = AXIAL S.D.H.

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/23/93
	2	[signature]	LEVEL	II	DATE 9/23/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-1-93
	2	[signature]	LEVEL	N/A	DATE 10/9/93
	3	[signature]	LEVEL	ANII	DATE 10/13/93

DATA SHEET NO. 1223-008
PAGE 3 OF 24
BASE MATERIAL EXAM, REDUCER (CPL-216 WELD #1 W.R.V.) AND EXPANDER

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.04 Delay 7.46
Range 2.5
Gain (coarse) ± 20 / = 20 dB
Gain (fine) ± 20 / = 20 dB
Reference Sensitivity ± 20 / = 20 dB
Remarks: N/A

SEARCH UNIT

Serial No. EIB404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 70 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

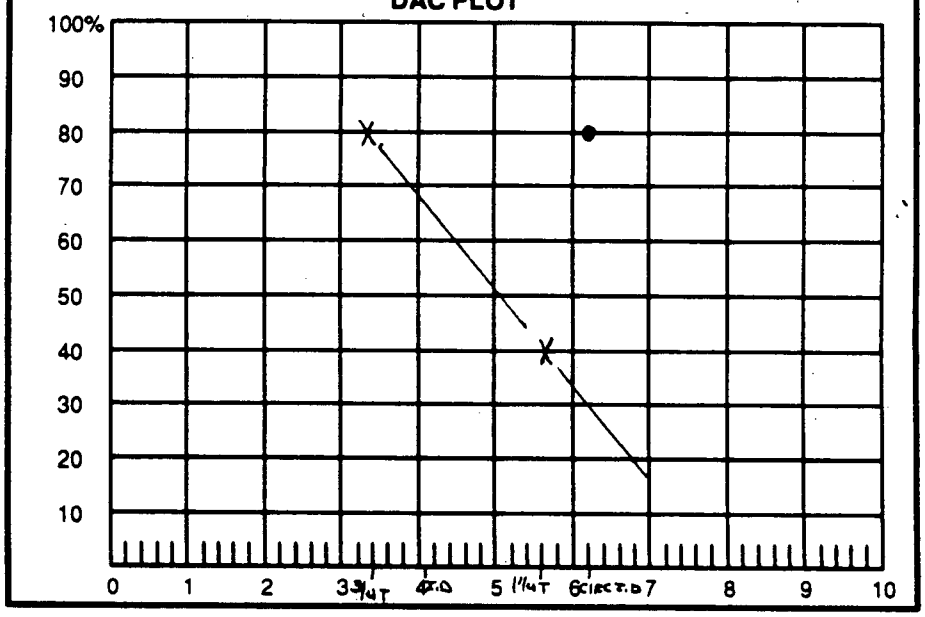
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1015
INTERMEDIATE	1217
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1845

DAC PLOT



REMARKS: I.D. NOTCH FALLS AT DAC
• = CIRC I.D. NOTCH
X = AXIAL S.O.H.

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/23/93
	2	David M Mynatt	LEVEL	II	DATE 9/23/93
REVIEWERS	1	Scott [illegible]	LEVEL	III	DATE 10-1-93
	2	Robert A Weber	LEVEL	N/A	DATE 10/9/93
	3	A Belladonna	LEVEL	ASME III	DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-003
PAGE 4 OF 24

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 8" S/G F.W. REDUCER
ISO/DWG. NO. CDL-216 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM
"B" S/G F.W. REDUCER BASE MATERIAL

SCAN 45 ° SCAN dB 32				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. GEOMETRIC INDICATIONS NOTED AT BELOW RECORDABLE LEVELS. Includes Examination of Welds #1 and #2 from Reducer Side.

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. Includes Examination of Welds #1 and #2 from Reducer Side.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL ___ DATE 9/23/93
2 David M Mantas LEVEL II DATE 9/23/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 Richard A Wicks LEVEL N/A DATE 10/9/93
3 RA Valladares LEVEL ANI DATE 10/12/93

DATA SHEET NO. 1223-008
PAGE 5 OF 24

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "B" S/G FW. REDUCER
ISO/DWG. NO. CPL-216 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM
"B" S/G FW. REDUCER BASE MATERIAL EXAM.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. Includes Examination of Welds #1 and #2 from Reducer Side.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. Includes Examination of Welds #1 and #2 from Reducer Side

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/13/93
2 [signature] LEVEL II DATE 9/23/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL Authorized DATE 10/13/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM

Weld #1 WRV And Expander
BASE MATERIAL EXAM

ISO/DWG. NO.

CPL-216

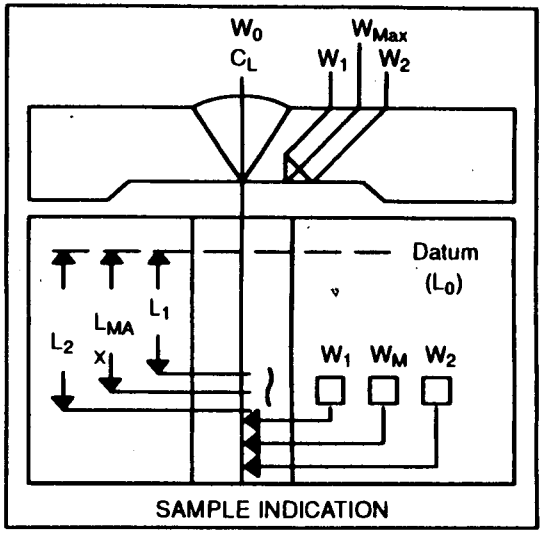
ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-008

PAGE 6 OF 24

SEARCH UNIT ANGLE 45 ° W_0 LOCATION ℄ of Weld L_0 LOCATION TDC



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	25%	.55"	.875"	.40"	.75"	.60"	.95"	.5"CCW	.3"CCW	.1"CW	N/A	U.S.	Indications #1 and #2 are
2	20%	.95"	1.225"	.85"	1.15"	1.2"	1.3"	.5"CCW	.3"CCW	.1"CW	N/A	D.S.	Non-Metallic Inclusions, And
													were Recorded to Confirm and
													to assist in Disposition of
													Indications Recorded on 60°
													Indication Report Sheet

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

Note: See 60° Indication Report Sheet

EXAMINERS	1		LEVEL III	DATE 9/23/93
	2	David M Monroe	LEVEL II	DATE 9/23/93
REVIEWERS	1	Scott Lamm	LEVEL III	DATE 10-1-93
	2	Richard B. Weber	LEVEL N/A	DATE 10/9/93
	3	[illegible]	LEVEL [illegible]	DATE 10/12/93

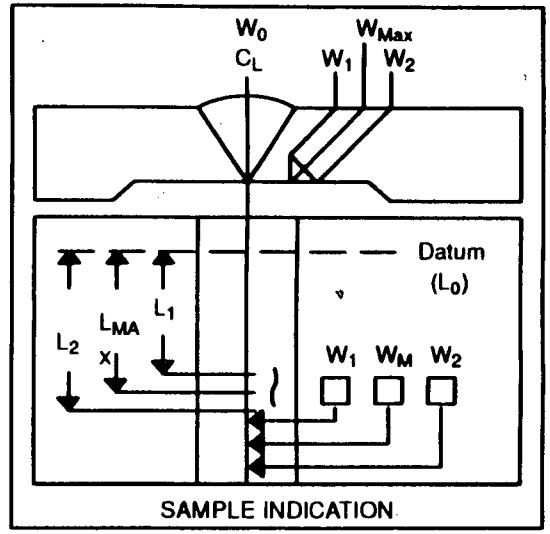
EXAM ITEM: BASE MATERIAL EXAM, REDUCER WELD #1 W.R.V AND EXPANDER

ISO/DWG. NO.: CPL-216

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-UT



SAMPLE INDICATION

SEARCH UNIT ANGLE 60 ° W0 LOCATION ℄ of Weld L0 LOCATION TDC

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind.	%	W MAX		FWD 50% DAC*		BACKWARD 50% DAC*		L_1	L	L_2	RBR	S.U.	REMARKS
No.	of DAC*	W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	125%	1.0"	1.2"	.80"	1.05"	1.3"	1.55"	.5"ccw	.25ccw	.25"cw	N/A	U.S.	Indication* 1, *2 and *3
2	40%	1.2"	1.4"	1.1"	1.35"	1.45"	1.65"	.5"ccw	.25ccw	.10cw	N/A	U.S.	are Non Metallic Inclusions. They
3	30%	1.2"	1.5"	1.1"	1.45"	1.50"	1.75"	.5ccw	.25ccw	.10cw	N/A	D.S.	can also be Seen with a 0° at
													Depths of .64", .68", And are
													located at .1" to .2" D.S. from
													℄ of Weld. Verified with ID Profiles
													and Beam Plots. Review of
													Radiographs also confirmed the
													Existence of Non Metallic Inclusions.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

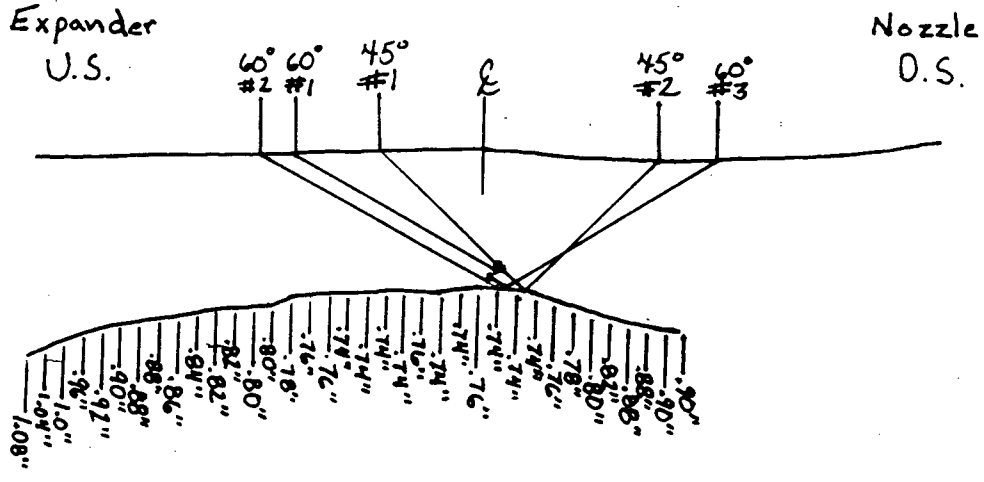
Note: Also See 45° Indication Report Sheet.

EXAMINERS 1 _____ LEVEL III DATE 9/23/93
2 _____ LEVEL II DATE 9/23/93

REVIEWERS 1 _____ LEVEL III DATE 10-1-93
2 _____ LEVEL N/A DATE 10/9/93
3 _____ LEVEL N/A DATE 10/3/93

NUCLEAR ENERGY SERVICES, INC.

Weld #1



9/23/83

PLANT/UNIT: HBR 2
ISO: 216 Weld 1
COMP./SYS.: FW
LOOP: B

ULTRASONIC EVALUATION SHEET

DATA PKG: 1223-008
PAGE 9 OF 24
EXAM ITEM: 216 1
PROCEDURE: SP 1223
REV./F.C.: 0
TITLE: UT of Piping

SIZING METHOD USED: ☒ 6 dB Drop ☐ 12 dB Drop ☐ 20 dB Drop
☐ Satellite Pulse Observation Technique (SPOT)
☐ Pulse Arrival Time Technique (PATT)
☐ Multipulse–Observation Sizing Technique
☐ 30–70–70 Mode Conversion (Creeping Longitudinal Wave)
☐ Other (Describe): _____

SIZING PARAMETERS: MATERIAL: Ferritic THICKNESS (T): .74" (☐ NOMINAL ☒ ACTUAL)
(NOTE: Only applicable data is to be recorded.)
See Indication Report Sheet page — of —, Indication # 1

		1	2	3	4	5
THROUGH WALL DIMENSION	('a')	.1				
FLAW LENGTH	('l')	.25				
LAMINER INDICATION WIDTH	(W)	N/A		N		
DEPTH FROM I.D.	(l_1)	.09				
DEPTH FROM O.D.	(O_1)	.55		A		
PROXIMITY TO NEAREST SURFACE	(S)	.09				
SURFACE CHARACTERIZATION LIMIT		.02				

(0.4 X 1/2 Through Wall Dimension)

CHARACTERIZATION: Subsurface

	(a)	.05				
ASPECT RATIO	(a/l)	.20		N		
S/a		1.8				
(MULTIPLY BY Y IF SUB-SURFACE) Flaw actual a/T	(Y)=1	6.75		A		
ALLOWABLE FLAW SIZE	(a/t)	17.7				

ACCEPTANCE CRITERIA: ASME SECT. XI ED. 1986 ADDENDUM Usne PARA. IWC-3514

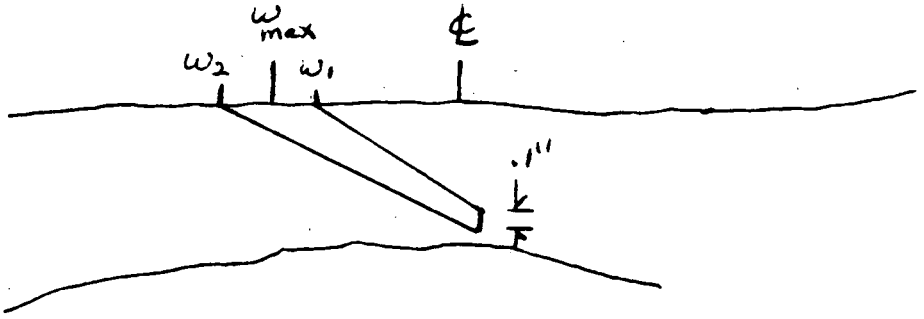
OTHER: N/A

COMMENTS: Flaw does not exceed the allowable flaw size per Table IWB-3514-1
Non-metallic inclusion - verified on radiograph. See attached

EXAMINER 1: Scott Lawson LEVEL: III DATE: 9-24-93
EXAMINER 2: N/A LEVEL: N/A DATE: N/A
REVIEWER 1: [signature] LIII DATE: 10/2/93
REVIEWER 2: Richard B. Weber DATE: 10/2/93
REVIEWER 3: R Wallace MNM DATE: 10/13/93

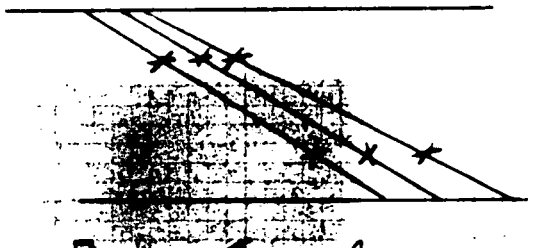
NES

REF.



Indication #1 See Indication Report Sheet and UT Evaluation Sheet

Scott Jansen LIII 9-24-93



Beam Spread measurements
for
60° S/N E18404

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-008
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID: ____

Type: ____

Material: N/A

Measured Beam Angle: ____

INSTRUMENT

☐ digital ☒ analog

Model: USK-7

Serial No: 27276-749

Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒

Serial No: B05236

Frequency: 2.25 Mhz

Size: .5 x .5

Manufacturer: AEROTECH

SIMULATOR BLOCK

ID: ____

Reflector Type: ____

CE-2: ____ Div's N/A

Pulse Separation: ____ Depth: ____

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/Fine	12	
Filter	FIXED	

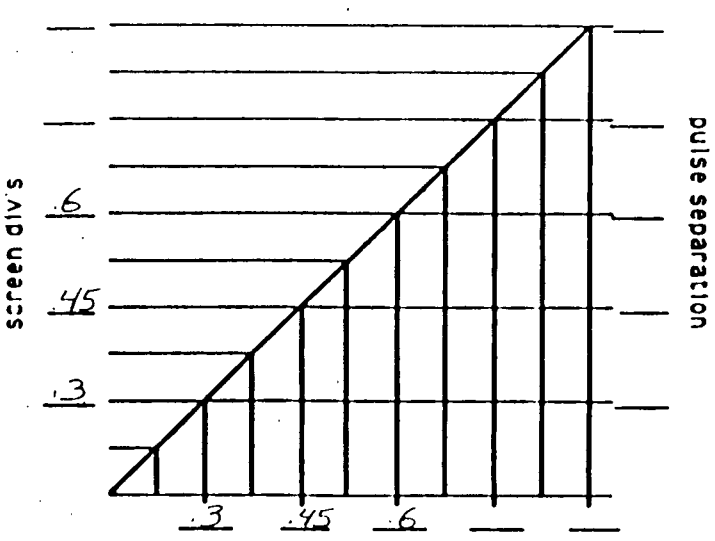
Pulse/Echo ☐

Thru trans ☒

Jack Used: T ✓ /R ✓

Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:

shear ☐

longitudinal ☒

bi-modal ☐

Type Reflector

holes: ☐

notches: ☒

☐ PATT

☒ HALT

☐ MOST

☐ SPOT

☐ 30-70-70

Measured Beam Angle 45 deg

CE-2: ____ Div's

CABLES

RG62 ☒

RG58 ☐

RG174 ☐

Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

Remarks: CPL-216 WELD #1

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	III	10-1-93	RBW 10/3/93 [signature]	10/13/93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A

REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1233-008
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:

Type: N/A

Material:

Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog

Model: USK-7

Serial No: 27276-807

Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒

Serial No: 2211-93001

Frequency: Mhz

Size: 2 (25mm x 12mm)

Manufacturer: SIGMA

SIMULATOR BLOCK

ID:

Reflector Type: N/A

CE-2: Div's

Pulse Separation: Depth

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	6.70	
Mat'l Cal	7.90	N/A
Frequency	FIXED	
Gain/Coarse	20	
Gain/Fine	34	
Filter	FIXED	

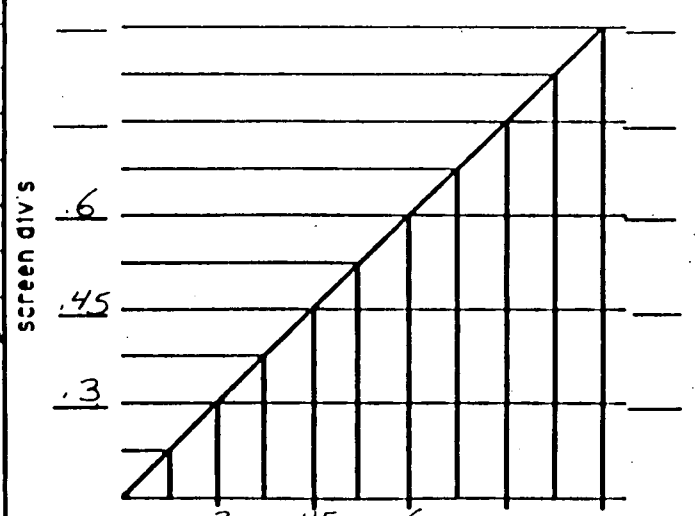
Pulse/Echo ☐

Thru trans ☒

Jack Used: T ✓ /R ✓

Rep Rate FIXED

CALIBRATION



☐ % thru wall ☒ depth in inches

METHOD

Wave Mode:

shear: ☐

longitudinal: ☒

bi-modal: ☐

Type Reflector

holes: ☐

notches: ☒

☐ PATT

☒ HALT

☐ MOST

☐ SPOT

☐ 30-70-70

Measured Beam Angle 60 deg

CE-2: Div's

CABLES

RG62 ☒

RG58 ☐

RG174 ☐

Length: 6'

Initial Calibration Time: 1030

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

Remarks: CRL-216 WELD #1

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	III	10-1-93	RBW 10/4/93 [signature]	10/13/93

DATA SHEET NO. 1223-008
PAGE 13 OF 24

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #1 FW
ISO/DWG. NO CPL 216 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 89 ° F

EXAM ITEM: Weld #1

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 David M Montes LEVEL II DATE 9/30/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/1/93
3 [signature] LEVEL [illegible] DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-008
PAGE 14 OF 24

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

CPL-216 ELBOW BASE MATERIAL

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.05 Delay 7.52
Range 2.5"
Gain (coarse) +20 / =20 dB
Gain (fine) +22 / =24 dB
Reference Sensitivity +42 / =44 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010 Dia. 16"
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

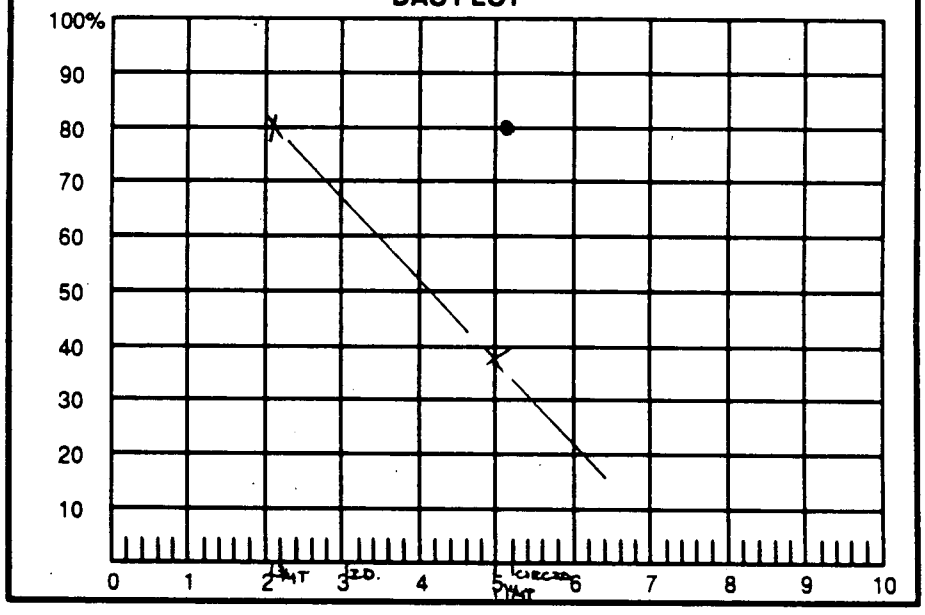
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	42
80	−12	22
40	+6	78
20	+12	76

CAL. CHECKS

	TIME
INITIAL CAL.	0824
INTERMEDIATE	1046
INTERMEDIATE	1300
INTERMEDIATE	N/A
FINAL CAL.	1530

DAC PLOT



REMARKS: I.D. NOTCH FALLS AT DAC
●: CIRC. I.D. NOTCH
X: AXIAL S.D.H.

EXAMINERS	1	[signature]	LEVEL III	DATE 9/25/93
	2	David M Wyatt	LEVEL II	DATE 9/25/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-1-93
	2	[signature]	LEVEL N/A	DATE 10/8/93
	3	[signature]	LEVEL [illegible]	DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-008
PAGE 15 OF 24

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "B" SG ELL. F.W.
ISO/DWG. NO. CPL-216 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM
"B" S/G F.W. ELBOW BASE MATERIAL EXAM.

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: SCANNED DOWNSTREAM HALF OF ELBOW FOR THERMAL FATIGUE CRACKING. NONE DETECTED. Includes Examination of Weld #2 from Elbow Side.

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED DOWNSTREAM HALF OF ELBOW FOR THERMAL FATIGUE CRACKING. NONE DETECTED. Includes Examination of Weld #2 from Elbow Side.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/25/93
2 David LaMonte LEVEL II DATE 9/25/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 Richard Baxter LEVEL N/A DATE 10/9/93
3 [signature] LEVEL Auth DATE 10/13/93

EXAM ITEM: "B" S/G ELBOW BASE MATERIAL

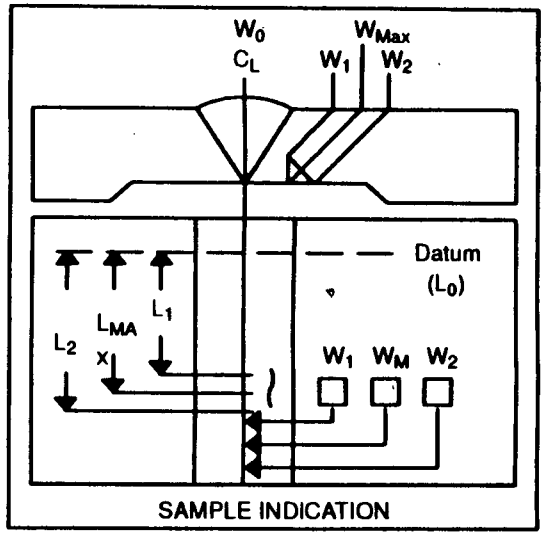
ISO/DWG. NO.: CPL-216

ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-008
PAGE 16 OF 24

SEARCH UNIT ANGLE 60° ° W_0 LOCATION E OF WELD #2 L_0 LOCATION I.D.C. of Weld #2



SAMPLE INDICATION

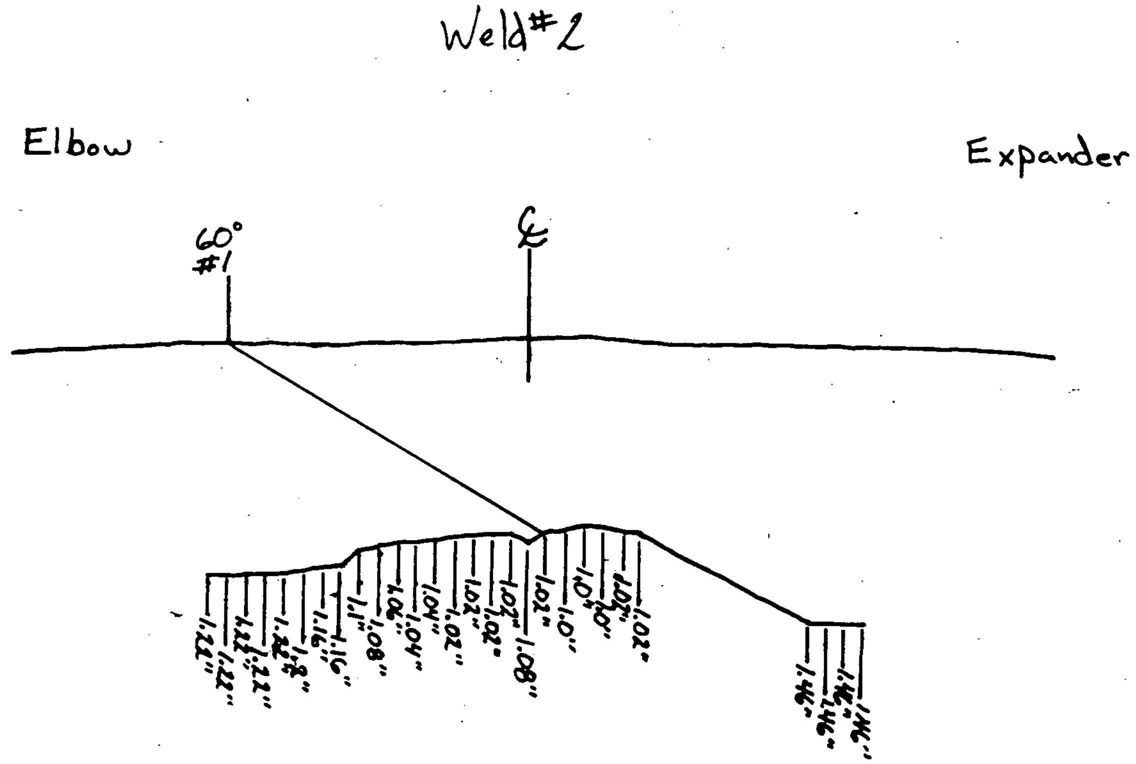
MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX	FWD 50% DAC*		BACKWARD 50% DAC*		L_1	L	L_2	RBR	S.U.	REMARKS
		W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	50%	1.7"	2.05"	N/A	N/A	N/A	N/A	*	2"CW	*	N/A	ELBOW FACING LOW	*SEEN 360° INTERMITTANT AT VARYING AMPLITUDES - ROOT GEOMETRY VERIFIED WITH 0° I.D. PROFILE AND BEAM PLOT of Weld #2

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1		LEVEL III	DATE 9/25/93
	2	David U Wyatt	LEVEL II	DATE 9/25/93
REVIEWERS	1		LEVEL III	DATE 10-1-93
	2	David B. Weber	LEVEL N/A	DATE 10/9/93
	3		LEVEL ASNT III	DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.


Weld #2
Elbow
Expander
60°
#1
℄
1.22"
1.22"
1.22"
1.22"
1.22"
1.18"
1.16"
1.16"
1.1"
1.08"
1.06"
1.04"
1.04"
1.02"
1.02"
1.02"
1.02"
1.08"
1.02"
1.0"
1.0"
1.0"
1.02"
1.02"
1.46"
1.46"
1.46"
1.46"

9/25/93

DATA SHEET NO. 1223-008
PAGE 18 OF 24

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-216
BASE-METAL-ELBOW

INSTRUMENT

Model USK-7
Serial No. 27276.749
Sweep Length 4.88 Delay 756
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 8 / 6 ± dB
Reference Sensitivity = 28 / 26 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010" Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

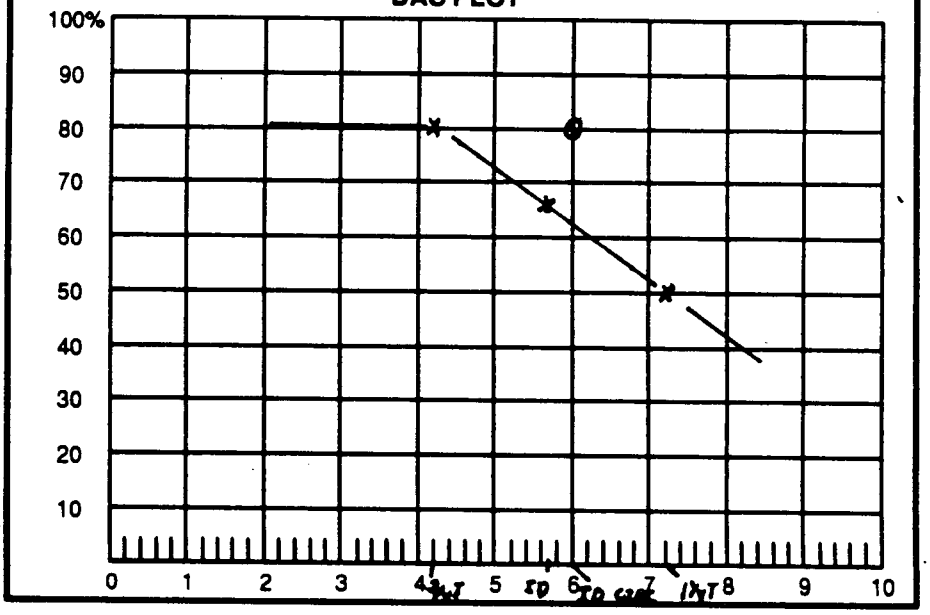
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1315
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1540

REMARKS: -10dB TO BRING I.D NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.H

EXAMINERS	1	Scott Lam	LEVEL	III	DATE 9-25-93
	2	Steve Wolfram	LEVEL	I	DATE 9-25-93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10/2/93
	2	Richard B Weber	LEVEL	N/A	DATE 10/9/93
	3	L Wallace	LEVEL	AUII	DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-008
PAGE 19 OF 24
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM FW
ISO/DWG. NO. CPL-216 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

BASE METAL - ELBOW

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
SCANNED HALF-WAY DOWN ELBOW FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. INCLUDES EXAMINATION OF WELD 2 FROM ELBOW SIDE.

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:
SCANNED HALF-WAY DOWN ELBOW FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. INCLUDES EXAMINATION OF WELD 2 FROM ELBOW SIDE.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 Scott Lamm LEVEL III DATE 9-25-93
2 Steve Wollam LEVEL I DATE 9-25-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/2/93
2 [signature] LEVEL N/A DATE 10/6/93
3 [signature] LEVEL ANII DATE 10/13/93

EXAM ITEM

WELD 2

ISO/DWG. NO.

CPL-216

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-04

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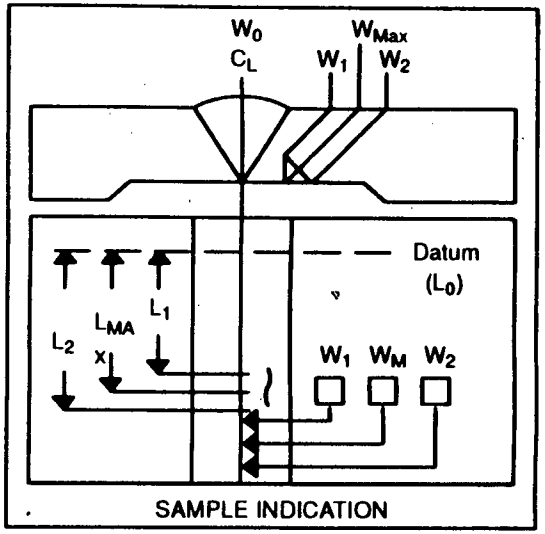


SAMPLE INDICATION

SEARCH UNIT ANGLE 45 ° W_0 LOCATION WELD ℄ L_0 LOCATION T.D.C.

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	50%	.9"	1.45"	N/A	N/A	N/A	N/A	N/A	3.5" CW	N/A	N/A	U.S.	360° INTERMITTENT See attached
								N					
									A				

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

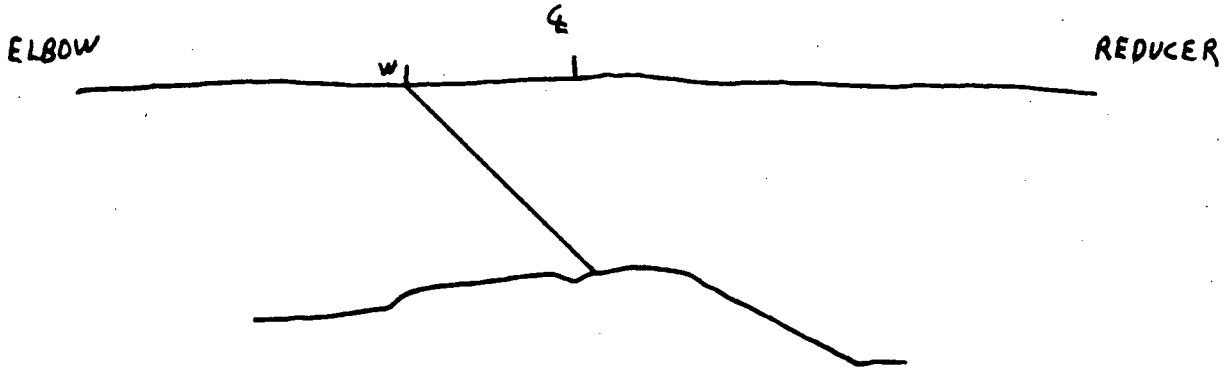
EXAMINERS	1	Scott Lawson	LEVEL III	DATE 9-25-93
	2	Steve Wollum	LEVEL I	DATE 9-25-93
REVIEWERS	1	[signature]	LEVEL III	DATE 10/2/93
	2	[signature]	LEVEL N/A	DATE 10/9/93
	3	[signature]	LEVEL ASNT	DATE 10/12/93

NES 000

NUCLEAR ENERGY SERVICES, INC.

1223-003

CPL-216
WELD 2



Root Geometry

EXAMINERS Scott Lim LEVEL III DATE 9-25-93

EXAMINERS Steve Wollum LEVEL I DATE 9-25-93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-008
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David G Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK
ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT
☐ digital ☒ analog
Model: USK-7
Serial No: 27276-749
Manufacturer: KRAUTKRAMER

TRANSDUCER
Single ☐ Dual ☒
Serial No: B05236
Frequency: 2.25 Mhz
Size: .5 x .5
Manufacturer: AREOTECH

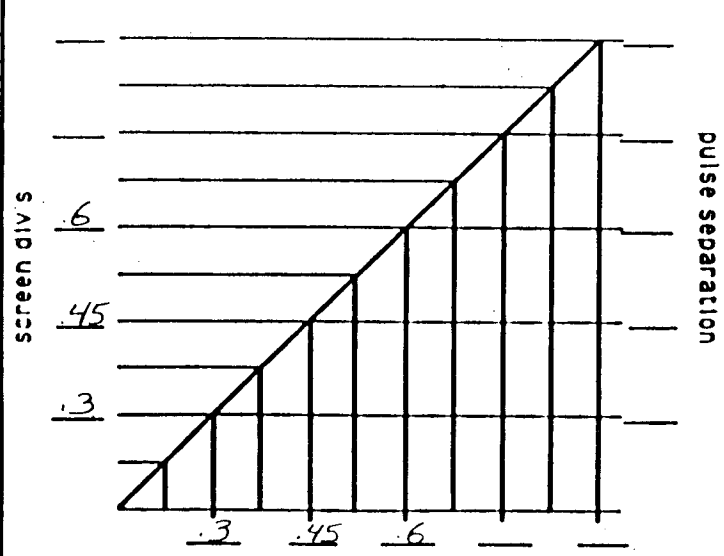
SIMULATOR BLOCK
ID:
Reflector Type:
CE-2: ____ Div's N/A
Pulse Separation: ____ Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/Fine	12	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear ☐
longitudinal ☒
bi-modal ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT ☒ HALT ☐ MOST ☐ SPOT ☐ 30-70-70

Measured Beam Angle 45 deg.

CE-2: ____ Div's

CABLES
RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

remarks CPL-216 WELD #2

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	II	10-1-93	RBW 10/4/93 [signature]	10-13-93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-008
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: ~~III~~	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-807
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: 2211-93001
Frequency: Mhz
Size: 2 (25mm x 12mm)
Manufacturer: SIGMA

SIMULATOR BLOCK

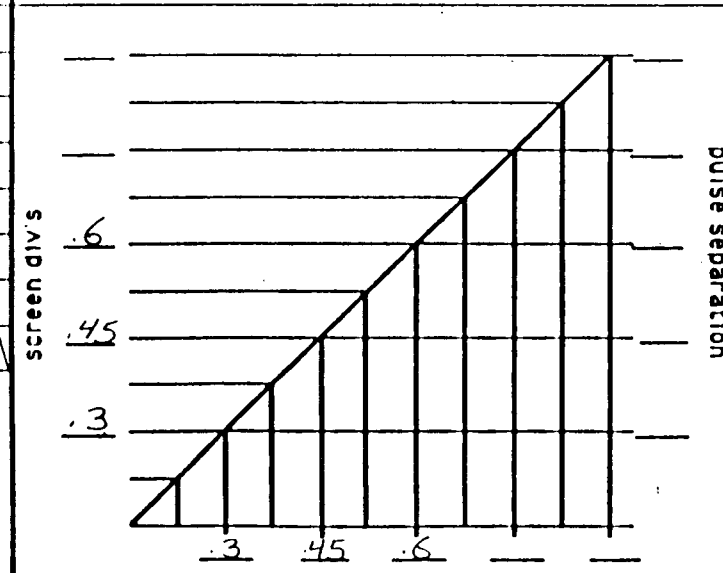
ID:
Reflector Type: N/A
CE-2: Div's
Pulse Separation: Depth:

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	6.70	
Mat'l Cal	7.90	N/A
Frequency	FIXED	
Gain/Coarse	20	
Gain/Fine	34	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70

Measured Beam Angle: 60 deg.

CE-2: Div's

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1030

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

remarks: CPL-216 WELD #2

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE
[signature]	III	10-1-93	R&S 10/4/93 [signature]	10/13/93

DATA SHEET NO. 1223-003
PAGE 24 OF 24

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #2 FW
ISO/DWG. NO. CPL-216 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 89 ° F

EXAM ITEM: Weld #2

SCAN 45 ° / SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN 60 ° / SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed

SCAN ____ ° / SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

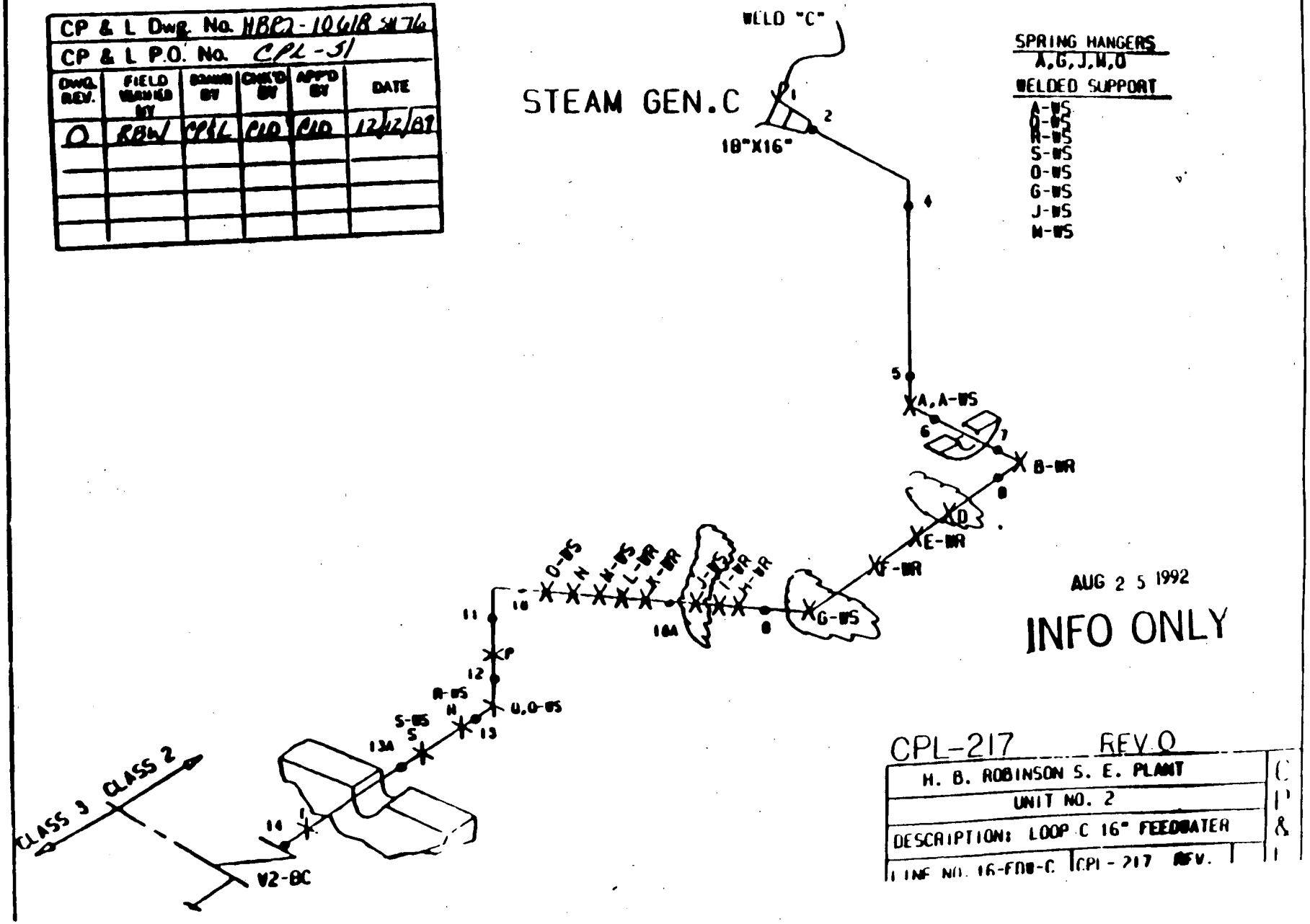
SCAN ____ ° / SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 David M Martin LEVEL II DATE 9/30/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/15/93

CP & L Dwg. No. HBR2-10618 SH 76					
CP & L P.O. No. CPL-31					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHECKED BY	APPD BY	DATE
0	RBW	CPSL	CJD	CJD	12/22/89



AUG 2 5 1992

INFO ONLY

CPL-217 REV.0

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP C 16" FEEDWATER	
LINE NO. 16-FDW-C	CPI - 217 REV.

C P & L

I certify that the Loads contained on this form are the

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page i of 1
PSI ☐ ISI ☒

Project Job No.

System: FEEDWATER	Component Name: SUPPORT/HANGER	Component ID: 217 D
Drawing/Location: CPL 217 D		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sims Level: II Date: 9-22-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

NO I.D TAG ON COMPONENT

Reviewed: Scott Lamm 9-24-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/27/93

ANII R Balladares 9-29-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-033
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Feedwater	Component Name: Variable Support	Component ID: 217G
Drawing/Location: CPL-217 R/O / RX. Bldg.-1'floor Elev. 251' ABOVE HVH 5B FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc-Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2700 lbs. (NEAR MISSILE BARRIER) and 3300 lbs. (SECONDARY WALL)		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") (See comments) ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments: HOT & COLD LOADS NOT AVAILABLE ON SPRING CANSOR DRAWING
NO INDICATIONS NOTED

Reviewed Scott Larson LEVEL III 10-4-93

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANI Recommendations 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-034
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: FW	Component Name: VARIABLE SUPPORT	Component ID: 217J
Drawing/Location: CPL-217R/O / RX. Bldg. 251'-Hour F/W. ABOVE AUX 5-B FAN		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☐ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: Shield Building Side - 3000 LBS.		Secondary Containment Wall Side: 2850 LBS.
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes") — see comments

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: 10-1-93

Comments: HOT & COLD LOADS NOT AVAILABLE ON SPRING CANS OR DRAWING

NO INDICATIONS NOTED

Reviewed: [signature] VT Level II 10-4-93 10-4-93

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Wallace 10/5/93

CPL 217
Base Metal at Reducer/Elbow

The attached data associated with NES Data Sheet pkg. 1223-007 includes the examination of the Base metal at Reducer/Elbow. This would include examination of CPL-217-1&2. UT techniques used were as follows.

1. 45° and 60° shear wave techniques of welds 1 and 2 and Base metal at Reducer/Elbow in the circ and axial directions.
2. 45° RL and 60° RL axial scans of welds 1 and 2 and adjacent base material for ~ 4" either side of welds. This exam was for the detection of flaw tips only.

Scott Lum LIII 10-4-93

DATA SHEET NO. 1223-007
PAGE 1 OF 22
BASE MATERIAL EXAM, REDUCER (CPL-217 WELD #1 W.R.V) AND EXPANDER

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.17 Delay 7.92
Range .5"
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity N/A dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25" DUAL GAMMA
Frequency 5.0 MHz
Mode LONGITUDINAL
Nom. Angle 0 °
Measured Angle N/A °
Cable Type SELF CONTAINED
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. 80C3613 E
"T" .1"-1.0" Dia. N/A
Temperature 84 ° F
Thermometer S/N 962

CALIBRATION

0° ✓ Axial N/A Circ. N/A
Metal Path ✓ Depth N/A
Each Major Screen Div. = .2"
Remarks PROFILE THICKNESS ONLY

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

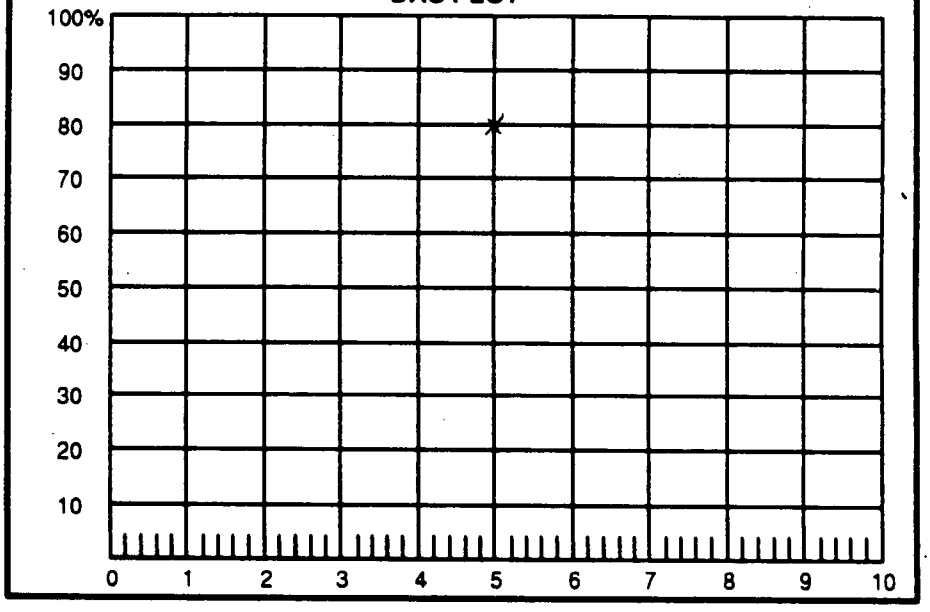
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1420
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1900

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 9/22/93
2 [signature] LEVEL II DATE 9/22/93
REVIEWERS 1 [signature] LEVEL III DATE 9-30-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-007
PAGE 2 OF 22
BASE MATERIAL EXAM, REDUCER (CPL-217 WELD #1 W.R.V.) AND EXPANDER

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-749
Sweep Length 4.90 Delay 7.60
Range 2.5"
Gain (coarse) T 0 / = 0 dB
Gain (fine) T 20 / = 28 dB
Reference Sensitivity T 20 / = 28 dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 44 °
Cable Type RG-174
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

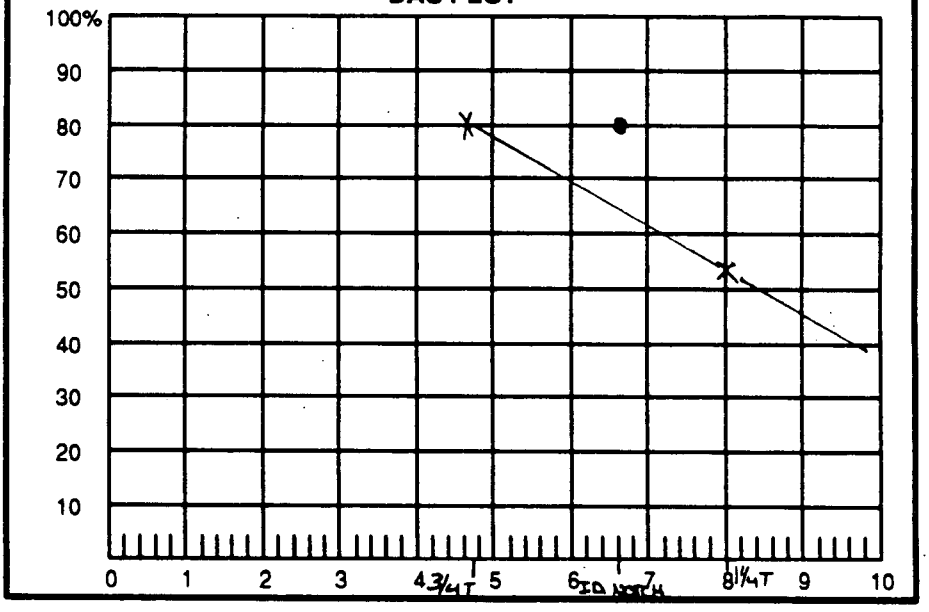
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	78
20	+12	78

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1350
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1900

REMARKS: -12dB I.D. NOTCH TO DAC
• = CIRC I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS 1 [signature] LEVEL III DATE 9/22/93
2 [signature] LEVEL II DATE 9/22/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/13/93

DATA SHEET NO. 1223-007
PAGE 3 OF 22
BASE MATERIAL EXAM, REDUCER (CPL-217 WELD #1 W.R.V) AND EXPANDER

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USN-7
Serial No. 27276-807
Sweep Length 8.04 Delay 7.46
Range 2.5"
Gain (coarse) T 20 / = 20 dB
Gain (fine) T 20 / = 20 dB
Reference Sensitivity T 40 / = 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. EIB404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-57
"T" 1.158" Dia. 18"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ✓ Circ. ✓
Metal Path ✓ Depth N/A
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

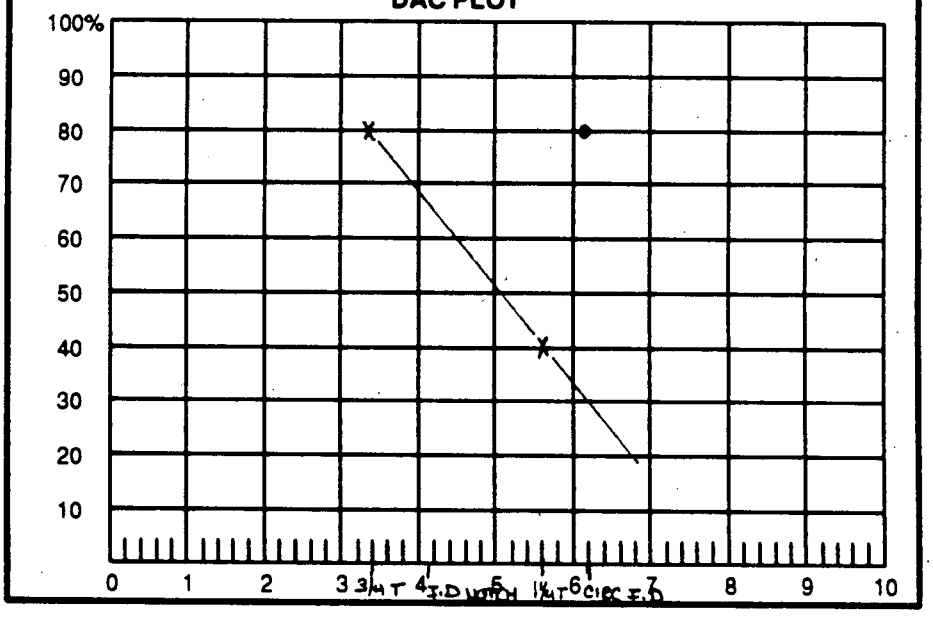
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1405
INTERMEDIATE	N/A
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	1905

REMARKS: I.D. NOTCH FALLS AT DAC
● = CIRC I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS	1	[signature]	LEVEL	III	DATE 9/22/93
	2	David W Mathis	LEVEL	II	DATE 9/22/93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-1-93
	2	[signature]	LEVEL	N/A	DATE 10/9/93
	3	[signature]	LEVEL	ANII	DATE 10/12/93

DATA SHEET NO. 1223-007
PAGE 4 OF 22

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "C" S/G FW. REDUCER
ISO/DWG. NO. CPL-217 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM
"C" S/G F.W. REDUCER BASE MATERIAL EXAM.

SCAN 45 ° SCAN dB 32				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. GEOMETRIC INDICATIONS NOTED AT BELOW RECORDABLE LEVEL.

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/22/93
2 Dana U Martin LEVEL II DATE 9/22/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 R A Wallendorf LEVEL ANII DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-007
PAGE 5 OF 22

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "C" S/G F.W. REDUCER
ISO/DWG. NO. CPL-217 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM
"C" S/G F.W. REDUCER BASE MATERIAL EXAM.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED REDUCER FOR DETECTION OF THERMAL FATIGUE CRACKING - NONE DETECTED.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/22/93
2 [signature] LEVEL II DATE 9/22/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/12/93

EXAM ITEM

WELD #1 W.R.V. AND EXPANDER BASE MATERIAL EXAM, REDUCER

ISO/DWG. NO.

CPL-217

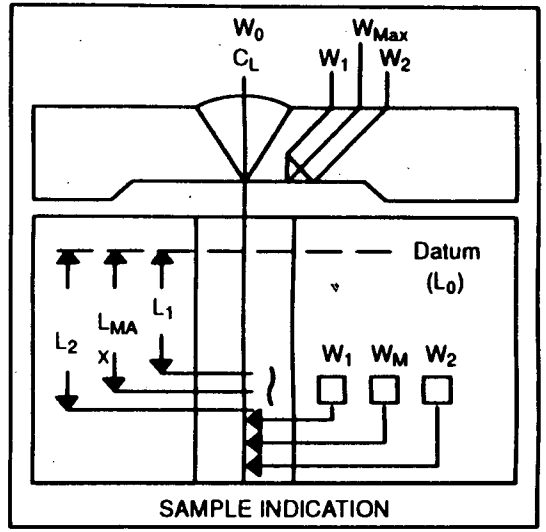
ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-007

PAGE 6 OF 22

SEARCH UNIT ANGLE 45° W_0 LOCATION WELD #1 E L_0 LOCATION I.D.C



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	30%	1.7"	1.0"	N/A	N/A	N/A	N/A	*	13"CW	*	N/A	U.S Facing Weld #1	* Indication is Counterbore seen 360° Intermittant at Varying Amplitudes. Verified with O.D. Profile and Beam Plots, and was Recorded to Confirm and to assist in Disposition of Indication Recorded on 60° Indication Report Sheet.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

Note: Beam Re-direction and Mode Conversion was Present with Indication #1, and Could be Dampened 1.2" in front of Wedge from Exit Point.

EXAMINERS	1	[signature]	LEVEL III	DATE 9/22/93
	2	[signature]	LEVEL II	DATE 9/22/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-1-93
	2	[signature]	LEVEL N/A	DATE 10/9/93
	3	[signature]	LEVEL ANII	DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM

WELD #1 W.R.U. AND EXPANDER (BASE MATERIAL EXAM. REDUCER)

ISO/DWG. NO.

CPL-217

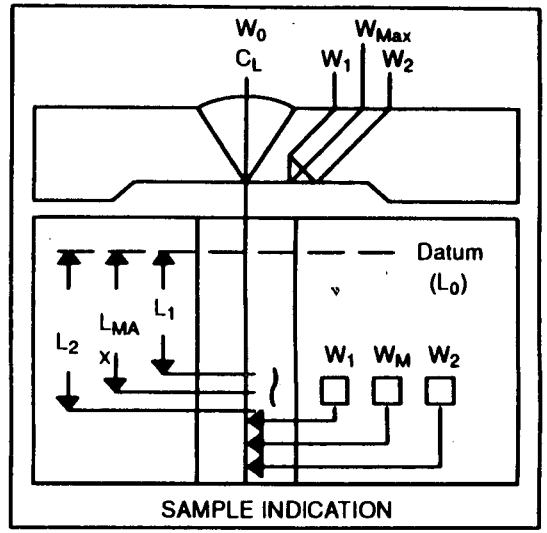
ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER _____

DATA SHEET NO. 1223-007

PAGE 2 OF 22

SEARCH UNIT ANGLE 60 ° W_0 LOCATION WELD #1 ℄ L_0 LOCATION T.O.C.



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

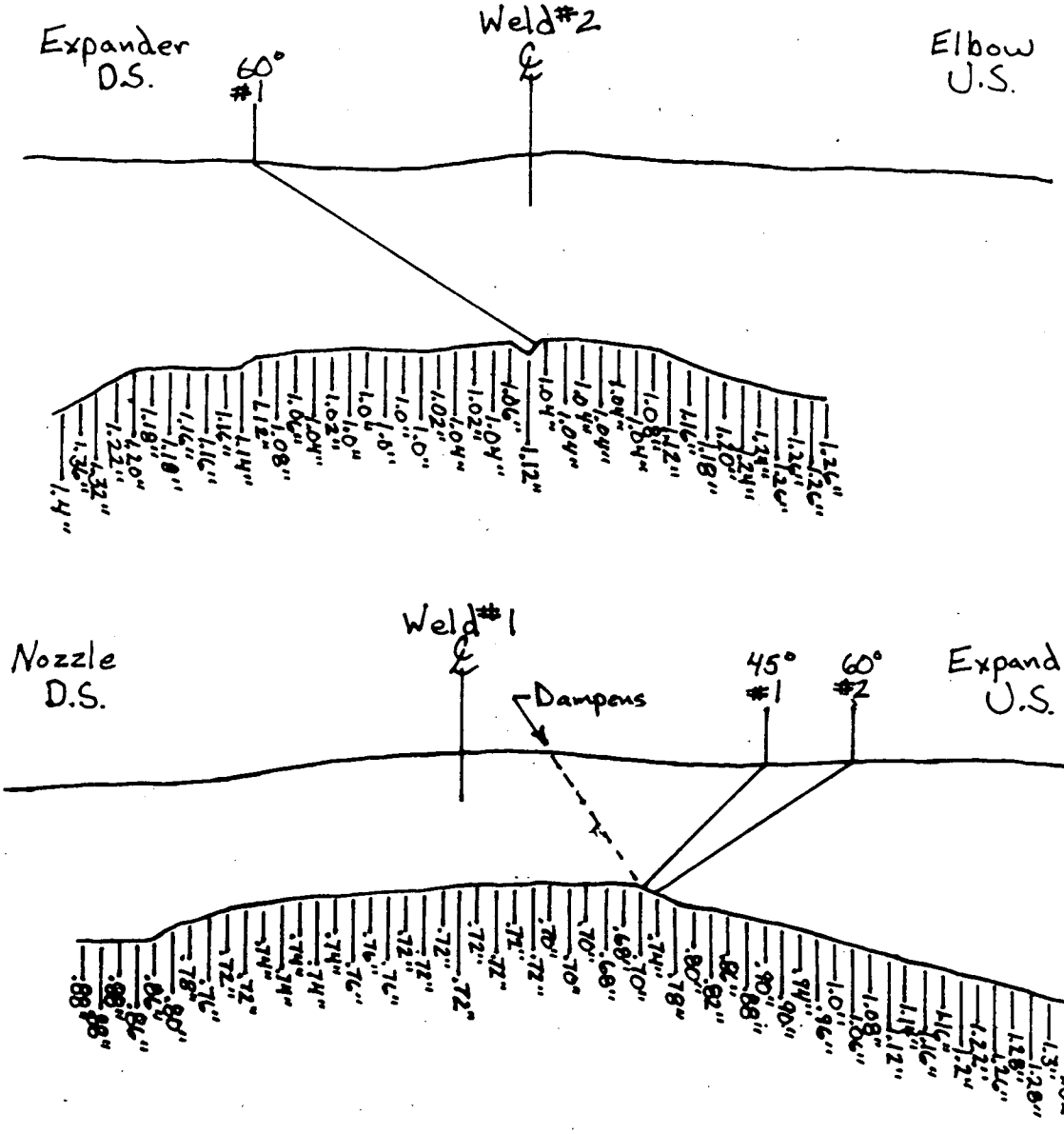
Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	70%	1.55"	1.95"	N/A	N/A	N/A	N/A	*	TDC	*	N/A	D.S. Facing Weld 2	* Both Indications were seen 360° Intermittent at Varying Amplitudes - Indication #1 is Root Geometry from Weld #2. Indication #2 is Counterbore from the U.S. side of Weld #1. Verified Both Indications with a 0° ID Profile and Beam Plots. Also See 45° Indication Report Sheet
2	100%	2.2"	1.25"	N/A	N/A	N/A	N/A	*	13"CW	*	N/A	U.S. Facing Weld 1	

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1		LEVEL III	DATE 9/22/93
	2		LEVEL II	DATE 9/22/93
REVIEWERS	1		LEVEL III	DATE 10-1-93
	2		LEVEL N/A	DATE 10/9/93
	3		LEVEL ANII	DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

Reducer Base Material



9/22/93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-007
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK
ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT
☐ digital ☒ analog
Model: USK-7
Serial No: 27276-749
Manufacturer: KRAUTKRAMER

TRANSDUCER
Single ☐ Dual ☒
Serial No: B05236
Frequency: 2.25 Mhz
Size: .5 x .5
Manufacturer: AEROTECH

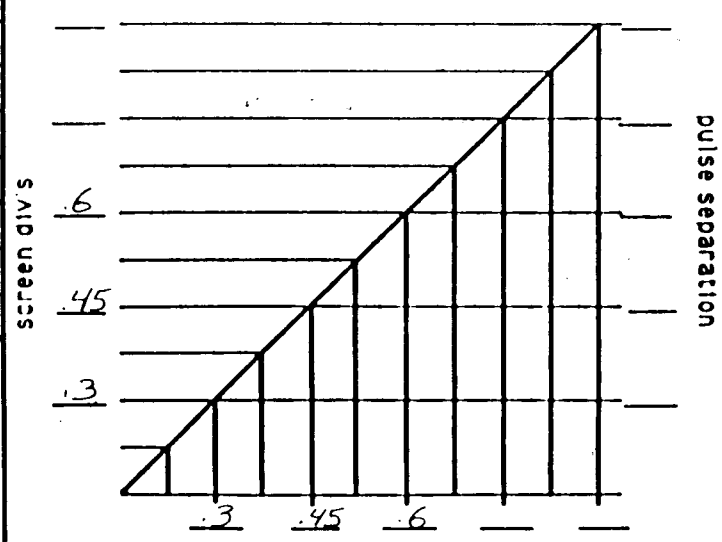
SIMULATOR BLOCK
ID:
Reflector Type: N/A
CE-2: ____ Div's
Pulse Separation: ____ Depth: ____

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/Fine	12	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: ____ Div's

Measured Beam Angle 45 deg.

CABLES
RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

remarks: CPL-217 WELD #1

REVIEWED BY: [signature] LEVEL: III DATE: 10-1-93
ANII REVIEW: [signature] [signature] DATE: 10/1/93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-007
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-807
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: 2211-93001
Frequency: Mhz
Size: 2 (25mm x 12mm)
Manufacturer: SIGMA

SIMULATOR BLOCK

ID:
Reflector Type: N/A
CE-2: Div's
Pulse Separation: Depth

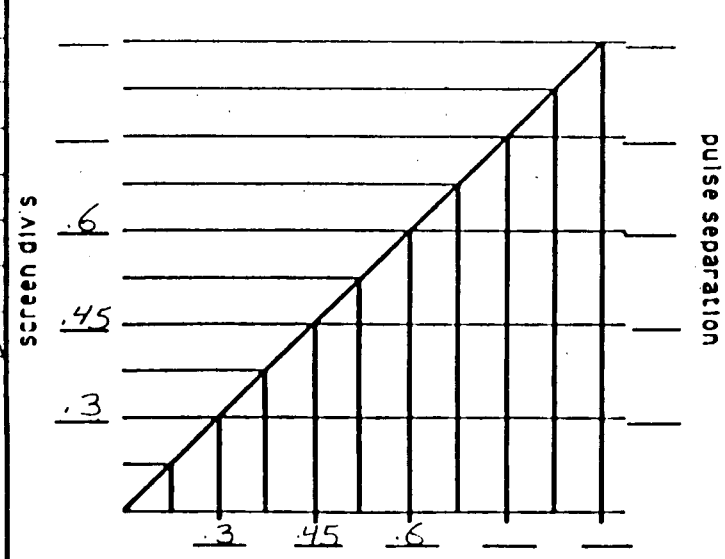
INSTRUMENT SETTINGS

Reject	MIN.
Damping	FIXED
Delay	6.70
Mat'l Cal	7.90
Frequency	FIXED
Gain/Coarse	20
Gain/Fine	34
Filter	FIXED

N/A

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: Div's

Measured Beam Angle 60 deg

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1030

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

remarks CPL-217 WELD #1

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	III	10-1-93	RBS 10/4/93 [signature]	10/13/93

DATA SHEET NO. 223-007
PAGE 11 OF 22

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld # 1 FW
ISO/DWG. NO. CPL 217 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 89 ° F

EXAM ITEM: Weld #1

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Reducer to Nozzle, Complete Reducer Side Only. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 [signature] LEVEL II DATE 9/30/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ASNT II DATE 10/3/93

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-007
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

CPL-217 ELBOW BASE MATERIAL

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 8.05 Delay 7.52
Range 2.5"
Gain (coarse) 120/=20 dB
Gain (fine) 122/=24 dB
Reference Sensitivity 142/=44 dB
Remarks: N/A

SEARCH UNIT

Serial No. E18404
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG-174
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-54
"T" 1.010 Dia. 16"
Temperature 80 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [✓] Circ. [✓]
Metal Path [✓] Depth [N/A]
Each Major Screen Div. = .5"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

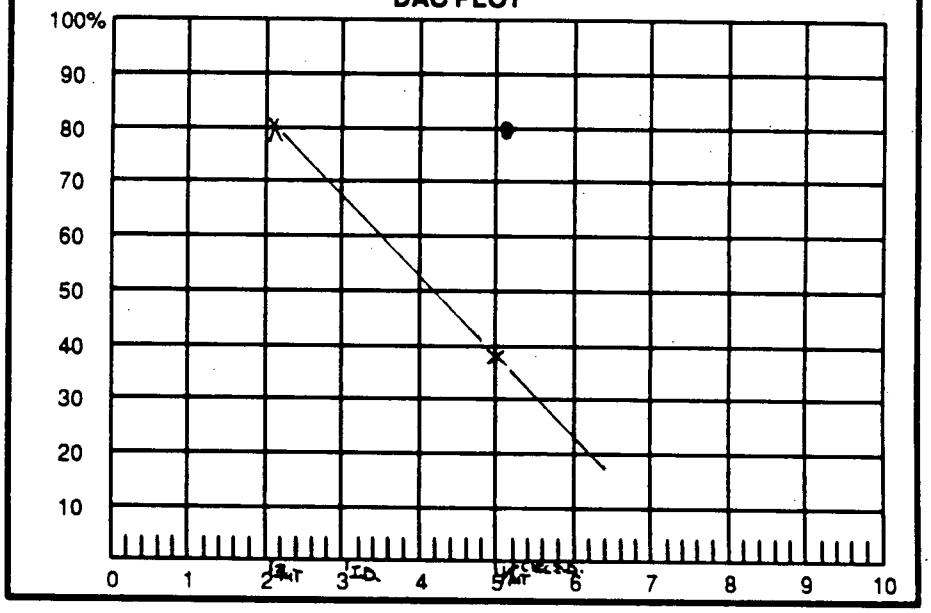
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	42
80	-12	22
40	+6	78
20	+12	76

CAL. CHECKS

	TIME
INITIAL CAL.	0824
INTERMEDIATE	1046
INTERMEDIATE	1300
INTERMEDIATE	N/A
FINAL CAL.	1530

DAC PLOT



REMARKS: I.D. NOTCH FALLS AT DAC
● = CIRC. I.D. NOTCH
X = AXIAL S.D.H.

EXAMINERS 1 [signature] LEVEL III DATE 9/25/93
2 [signature] LEVEL II DATE 9/25/93
REVIEWERS 1 [signature] LEVEL III DATE 10-1-93
2 [signature] LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM

"C" S/G F.W. ELBOW BASE MATERIAL.

ISO/DWG. NO.

CPL-217

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-007

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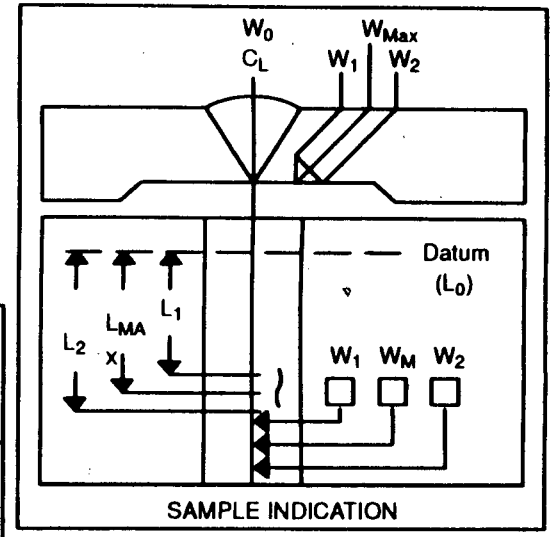
SEARCH UNIT ANGLE 60 ° W_0 LOCATION ℄ of Weld L_0 LOCATION TDC



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	100%	1.7"	2.1"	N/A	N/A	N/A	N/A	*	12"CCW	*	N/A	Elbow Facing W2	*Seen 360° Intermittant at Varying Amplitudes - Root Geometry. Verified with a 0° ID Profile and Beam Plot.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	[signature]	LEVEL III	DATE	9/25/93
	2	[signature]	LEVEL II	DATE	9/25/93
REVIEWERS	1	[signature]	LEVEL III	DATE	10-1-93
	2	[signature]	LEVEL N/A	DATE	10/9/93
	3	[signature]	LEVEL N/A	DATE	10/13/93

DATA SHEET NO. 223-007
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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM "C" S/G F.W. ELL.
ISO/DWG. NO. CPL-212 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM
"C" S/G F.W. ELBOW BASE MATERIAL EXAM

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	✓	N/A	N/A	✓	N/A	✓	N/A	N/A	✓	✓	N/A

REMARKS: SCANNED DOWNSTREAM HALF OF ELBOW FOR THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN 60 ° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	✓	N/A	✓	N/A	N/A	✓	N/A	✓	✓	N/A

REMARKS: SCANNED DOWNSTREAM HALF OF ELBOW FOR THERMAL FATIGUE CRACKING. NONE DETECTED.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

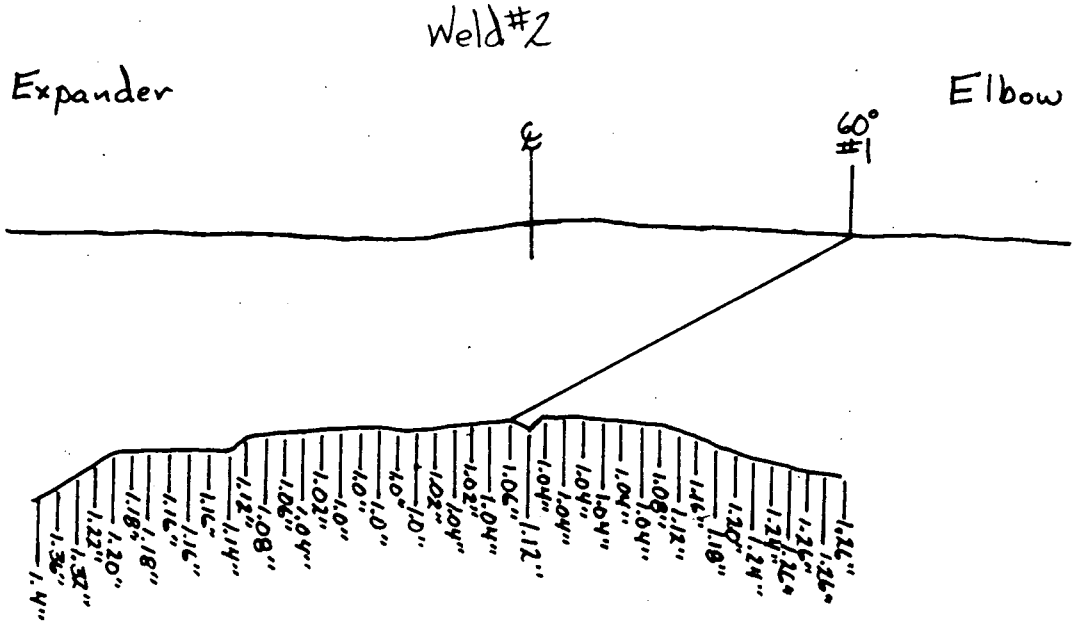
SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/25/93
2 [signature] LEVEL II DATE 9/25/93

REVIEWERS:
1 [signature] LEVEL N/A DATE 10/9/93
2 [signature] LEVEL ANII DATE 10/13/93
3 _____ LEVEL _____ DATE _____

Elbow Base Material



9/25/93

DATA SHEET NO. 1223-007
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ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-217
BASE-METAL-ELBOW

INSTRUMENT

Model USK-7
Serial No. 27276.749
Sweep Length 4.88 Delay 7.56
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 8 / 6 ± dB
Reference Sensitivity = 28 / 26 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. M14135
Size .5
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-54
"T" 1.010" Dia. 16"
Temperature 90 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	9
5	60	30	10	10	4

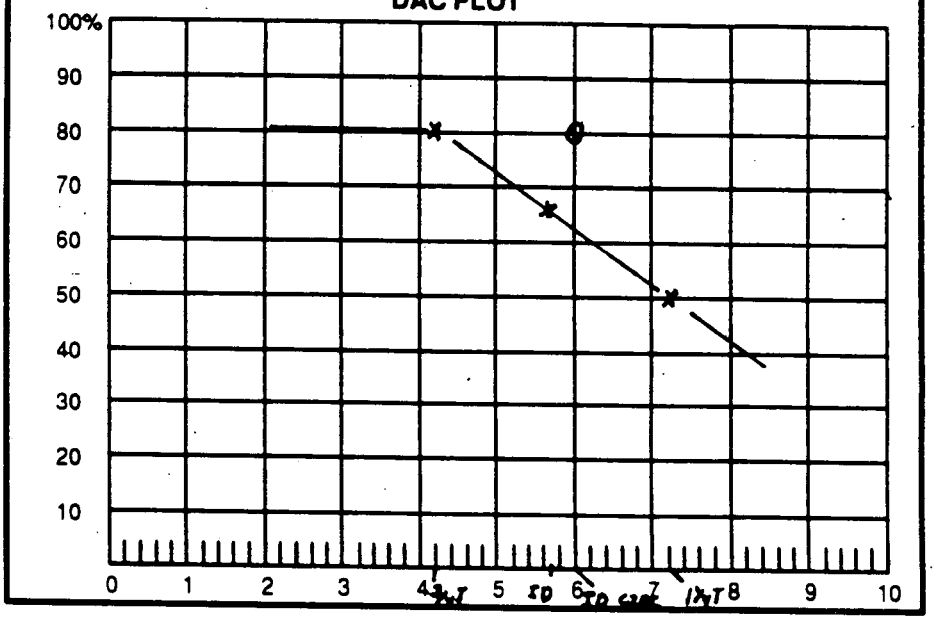
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	1315
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1540

DAC PLOT



REMARKS: -10dB TO BRING I.D NOTCH TO DAC
O = CIRC I.D. NOTCH
X = AXIAL S.D.N

EXAMINERS 1 Scott Larsen LEVEL III DATE 9-25-93
2 Steve Wollam LEVEL I DATE 9-25-93
REVIEWERS 1 [signature] LEVEL III DATE 10/2/93
2 Raymond B. Schuber LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ADII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-007
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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM FW
ISO/DWG. NO. CPL-217 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 90 ° F

EXAM ITEM

BASE METAL - ELBOW

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

SCANNED HALF-WAY DOWN ELBOW FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. INCLUDES EXAMINATION OF WELD 2 FROM ELBOW SIDE.

SCAN 45 ° SCAN dB 34				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

SCANNED HALF-WAY DOWN ELBOW FOR DETECTION OF THERMAL FATIGUE CRACKING. NONE DETECTED. INCLUDES EXAMINATION OF WELD 2 FROM ELBOW SIDE.

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 Scott Lawson LEVEL III DATE 9-25-93
2 Steve Wellman LEVEL I DATE 9-25-93

REVIEWERS:
1 [signature] LEVEL III DATE 10/2/93
2 Richard B. Weber LEVEL N/A DATE 10/9/93
3 [signature] LEVEL ANII DATE 10/13/93

NES NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM

WELD 2

ISO/DWG. NO.

CPL-217

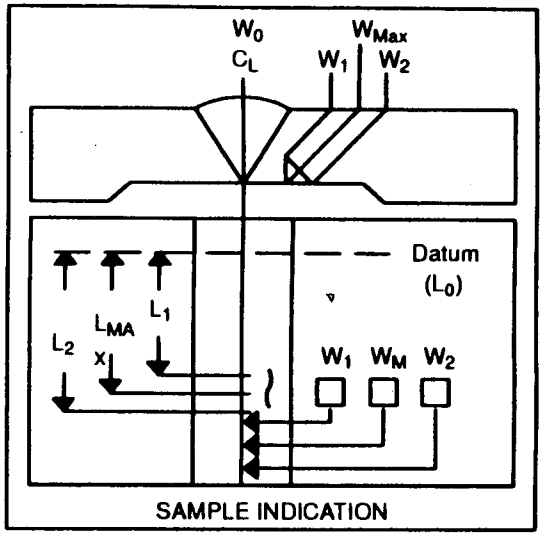
ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

DATA SHEET NO. 1223-007

PAGE 18 OF 22

SEARCH UNIT ANGLE 45 ° W_0 LOCATION WELD ℄ L_0 LOCATION I.D.C.



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	10	1	1.45"	N/A	N/A	N/A	N/A	N/A	10"CW	N/A	N/A	U.S.	360° INTERMITTENT See attached
								N					
								A					

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 Scott Lowe LEVEL III DATE 9-25-93

2 Steve Williams LEVEL I DATE 9-25-93

REVIEWERS 1 [signature] LEVEL III DATE 10/2/93

2 [signature] LEVEL N/A DATE 10/9/93

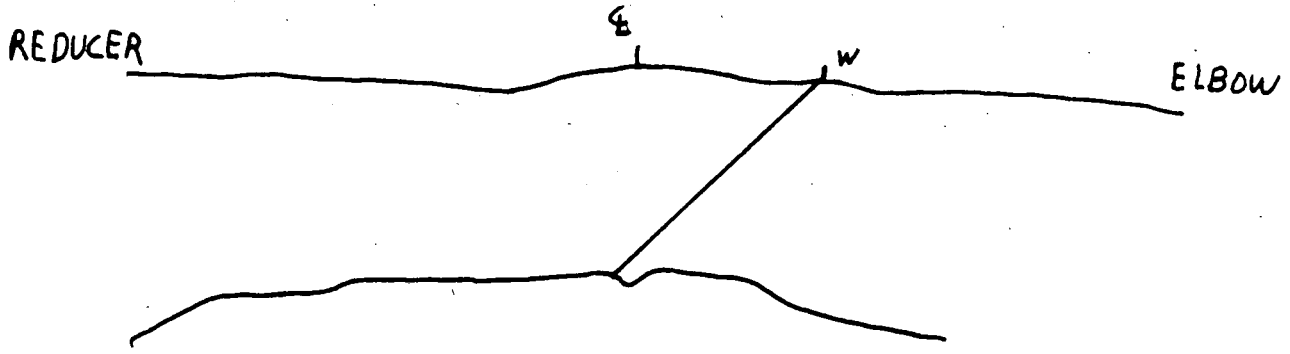
3 [signature] LEVEL QIII DATE 10/13/93

NUCLEAR ENERGY SERVICES, INC.

NES 9-90

CPL-217
WELD 2

1223-007



Root Geometry

EXAMINER Scott Lam LEVEL III DATE 9-25-93

EXAMINER Steve Wollum LEVEL I DATE 9-25-93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-007
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK
ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT
☐ digital ☒ analog
Model: USK-7
Serial No: 27276-749
Manufacturer: KRAUTKRAMER

TRANSDUCER
Single ☐ Dual ☒
Serial No: B05236
Frequency: 2.25 Mhz
Size: .5 x .5
Manufacturer: AEROTECH

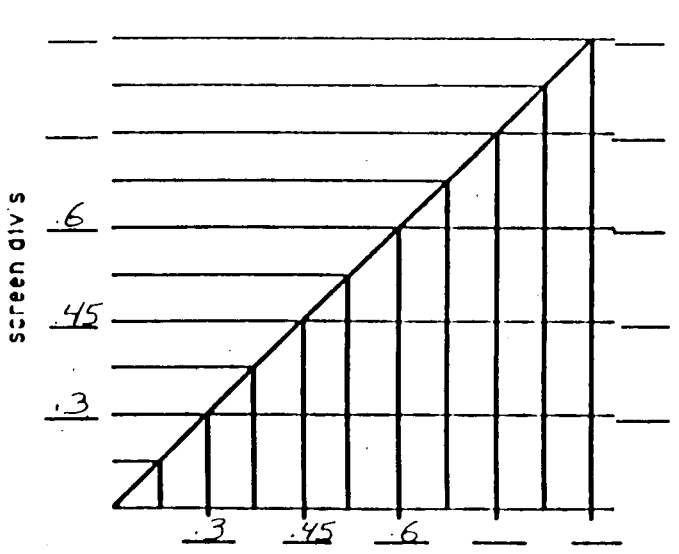
SIMULATOR BLOCK
ID:
Reflector Type:
CE-2: ____ Div's N/A
Pulse Separation: ____ Depth

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	7.21	
Mat'l Cal	6.30	N/A
Frequency	FIXED	
Gain/Coarse	40	
Gain/Fine	12	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear ☐
longitudinal ☒
bi-modal ☐

Type Reflector
holes ☐
notches ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: ____ Div's

Measured Beam Angle 45 deg.

CABLES
RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1045

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1525	

Remarks: CPL-217 WELD #2

REVIEWED BY: [signature]	LEVEL: III	DATE: 10-1-93	ANII REVIEW: RBN 9/9/93 [signature]	DATE: 10/13/93

CAROLINA POWER & LIGHT COMPANY

ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

FORM QA UT-16A
REVISION 0

Plant: HBR	Unit: 2	Date: 9/30/93	Sheet number: 1223-007
Procedure: NDEP-426	Rev: 0	Couplant: ULTRAGEL II	Batch No: 093051
Examiner: [signature]	Level: III	Calibration Block ID: CPL-UT-004	Pyrometer S/N: 962
Examiner: David M Martin	Level: II	Calibration Block Temp: 72°	

REFERENCE BLOCK

ID:
Type:
Material: N/A
Measured Beam Angle:

INSTRUMENT

☐ digital ☒ analog
Model: USK-7
Serial No: 27276-807
Manufacturer: KRAUTKRAMER

TRANSDUCER

Single ☐ Dual ☒
Serial No: 2211-93001
Frequency: Mhz
Size: 2 (25mm x 12mm)
Manufacturer: SIGMA

SIMULATOR BLOCK

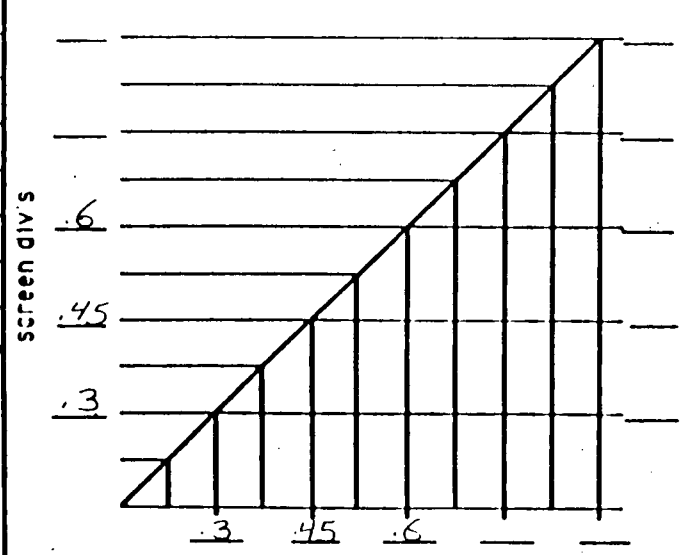
ID:
Reflector Type: N/A
CE-2: Div's
Pulse Separation: Depth

INSTRUMENT SETTINGS

Reject	MIN.	
Damping	FIXED	
Delay	6.70	
Mat'l Cal	7.90	N/A
Frequency	FIXED	
Gain/Coarse	20	
Gain/Fine	34	
Filter	FIXED	

Pulse/Echo ☐
Thru trans ☒
Jack Used: T ✓ /R ✓
Rep Rate FIXED

CALIBRATION METHOD



☐ % thru wall ☒ depth in inches

Wave Mode:
shear: ☐
longitudinal: ☒
bi-modal: ☐

Type Reflector
holes: ☐
notches: ☒

☐ PATT
☒ HALT
☐ MOST
☐ SPOT
☐ 30-70-70
CE-2: Div's

Measured Beam Angle 60 deg.

CABLES

RG62 ☒
RG58 ☐
RG174 ☐
Length: 6'

Initial Calibration Time: 1030

CAL CHECKS

Time	Initials
1220	
1344	
N/A	
1527	

remarks CAL-217 WELD #2

REVIEWED BY:	LEVEL:	DATE:	ANII REVIEW:	DATE:
[signature]	II	10-1-93	RSW 10/1/93 [signature]	10/13/93

DATA SHEET NO. 1223-007
PAGE 22 OF 22

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM Weld #2 FW
ISO/DWG. NO CPL 217 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 89 ° F

EXAM ITEM

Weld #2

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed.

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	HALT	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	N/A	X	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Reducer, Complete Both Sides. Examination for the Detection of Crack Tips was Performed 360° using the High Angle L-Wave Technique. No Crack Tips were Observed

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

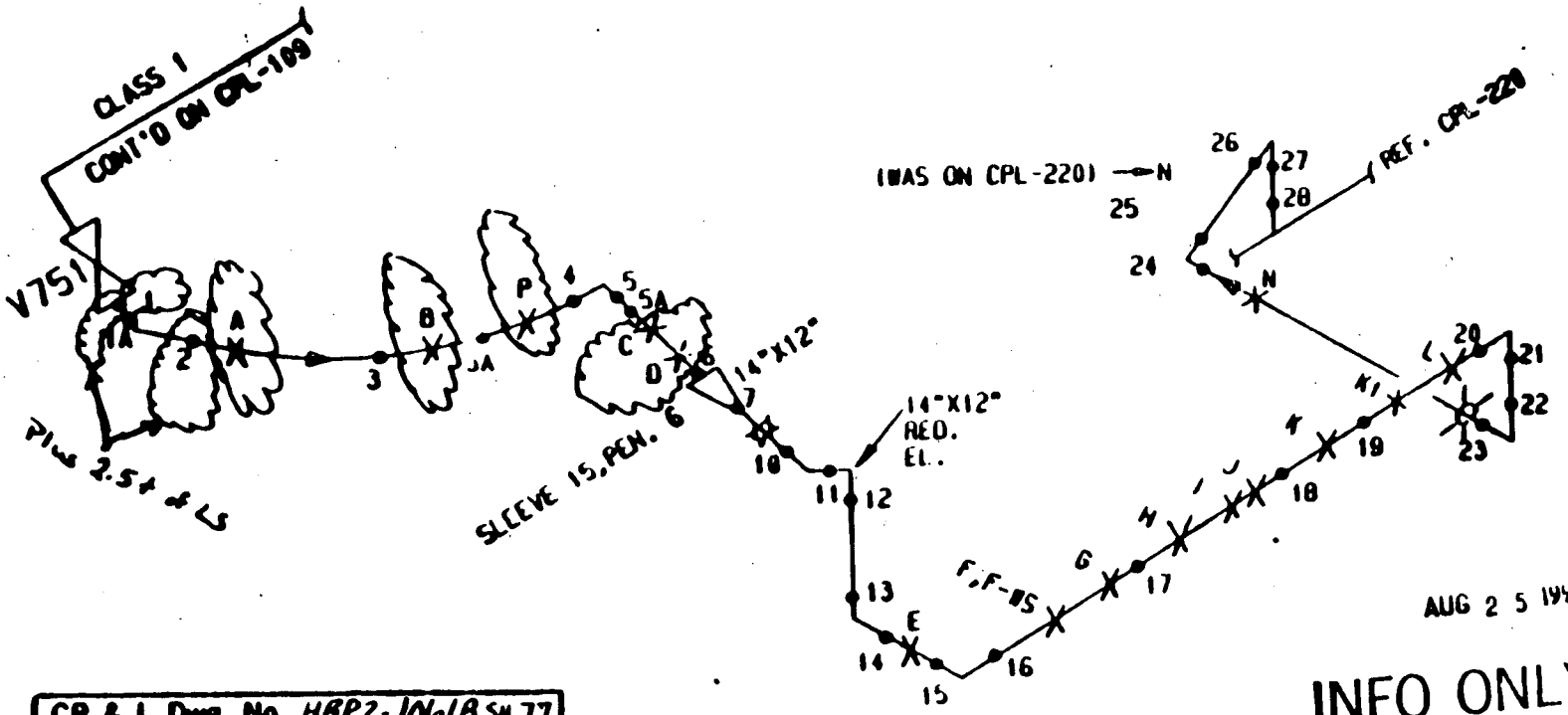
REMARKS:

EXAMINERS:
1 [signature] LEVEL III DATE 9/30/93
2 David A Martin LEVEL II DATE 9/30/93

REVIEWERS:
1 [signature] LEVEL III DATE 10-1-93
2 Richard B. Wilson LEVEL N/A DATE 10/9/93
3 [signature] LEVEL A/III DATE 10/12/93

I certify that the lines contained on this print were made in the actual and regular course of business on the date

SPRING HANGERS
A,C,E,N
WELDED SUPPORT
F-WS



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-10618 SH 77					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD REVISED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CELL	CLO	CLO	1-13-92

CPL-218 REV.0

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION: 14" RHR TAKEOFF	
LINE NO. 14-AC-9	CPL-218 REV.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-024
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RHR	Component Name: VARIABLE SUPPORT	Component ID: 218-A
Drawing/Location: CPL-218 R/O		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

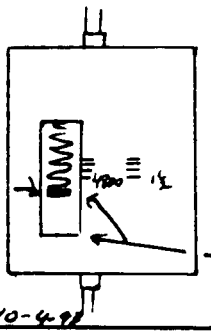
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		LAD BAR IS OFF SCALE
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		SEE SKETCH BELOW
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: OFF SCALE - SEE SKETCH BELOW		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

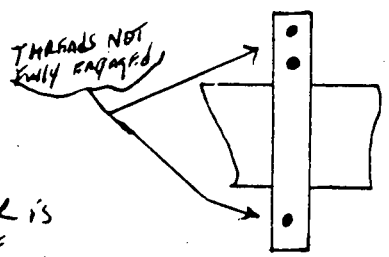
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-14-93

Examiner: [signature] Level: II Date: 9-14-93

Comments:





Reviewed [signature] 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/27/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-038
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RHR	Component Name: Support / Hanger	Component ID: 218-8
Drawing/Location: CPL-218 R/O		
☒ VT-3 Procedure: SP-1230 Rev. C	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9/13/93

Examiner: [signature] Level: II Date: 9-13-93

Comments: NO INDICATIONS NOTED

Reviewed: [signature] 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/6/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-037
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RHR	Component Name: Variable Support	Component ID: 218-C
Drawing/Location: CPL-218 R/O		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2750 lbs		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9/13/93

Examiner: [signature] Level: II Date: 9-13-93

Comments: NO INDICATIONS NOTED

Reviewed: Scott Lawson 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Walladares 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-023
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RHR	Component Name: Support/HANGER	Component ID: 218-D
Drawing/Location: CPL-218 R/O		
☒ VT-3 Procedure: SP. 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

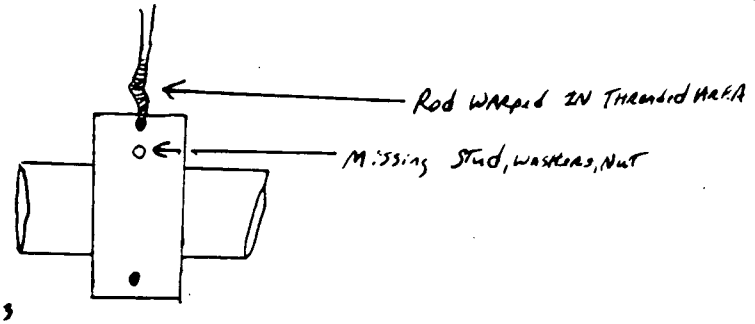
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-13-93

Examiner: [signature] Level: II Date: 9/13/93

Comments:



Reviewed: [signature] 10-4-93

(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard D. Weber Date: 10/20/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-009
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒ SI-3-3045

System: RHR	Component Name: Support/Hanger	Component ID: 218-P
Drawing/Location: CPL-218 R/L		
☒ VT-3 Procedure: SP-1230 Rev. C	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9/13/93

Examiner: [signature] Level: II Date: 9-13-93

Comments: NO INDICATIONS NOTED

Reviewed: Scott Lowe LIII 9-29-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 9/29/93

QA NDE ISI-11, Rev. 0, 07/93

AN II [signature] 9-29-93

DATA SHEET NO. 1217-053
THERMOMETER S/N MR92-03
TEMPERATURE 73 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S/S
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED RHR ISO/DWG/SK. # CPL-218 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	93B04K	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #1	NO RECORDABLE INDICATIONS	X	N/A
WELD #1, 2.5T OF L.S.	NO RECORDABLE INDICATIONS	X	N/A
WELD #2	NO RECORDABLE INDICATIONS	X	N/A
WELD #2, 2.5T OF L.S.	NO RECORDABLE INDICATIONS	X	N/A
N/A	N/A	N/A	N/A

EXAMINER [signature] LEVEL II DATE 10-9-93
EXAMINER [signature] LEVEL I DATE 10-9-93
REVIEWER [signature] LEVEL III DATE 10-10-93
REVIEWER [signature] DATE 10/11/93
REVIEWER [signature] DATE 10/11/93

DATA SHEET NO. 1223-036
PAGE 1 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-218 WELD 1

INSTRUMENT

Model USK-7
Serial No. 27276-4172
Sweep Length 4.94 Delay 7.94
Range 2.5
Gain (coarse) 0 dB
Gain (fine) 14 dB
Reference Sensitivity 14 dB
Remarks: N/A

SEARCH UNIT

Serial No. J10523
Size .5"
Frequency 2.25 MHz
Mode LONG
Nom. Angle 0°
Measured Angle N/A
Cable Type RG174/U
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-36
"T" 1.2" Dia. 14"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .5"
Remarks 5 SCREEN RANGE

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

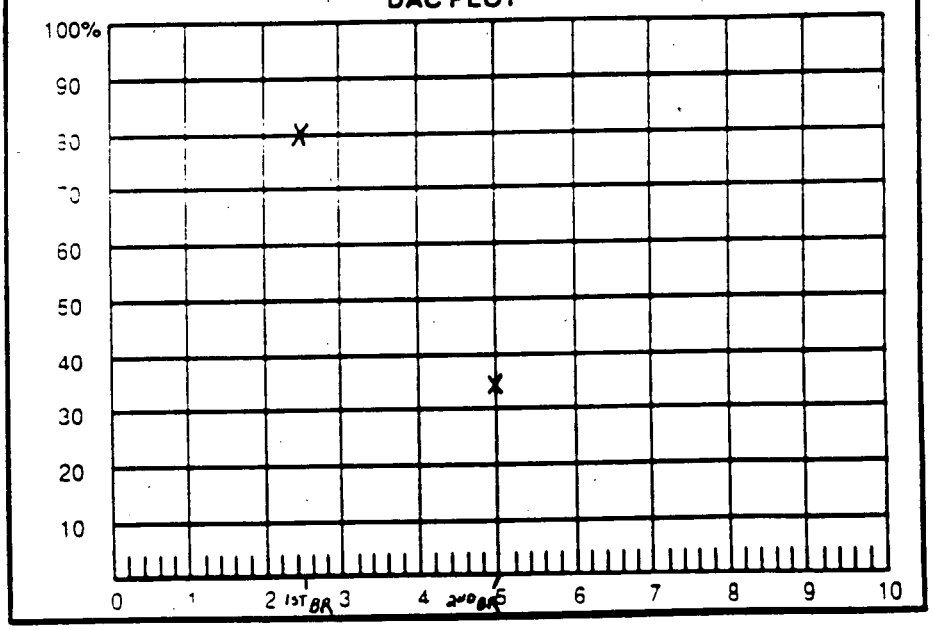
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1540
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1638

REMARKS:

EXAMINERS 1 Tim Olsen LEVEL II DATE 10-9-93
2 Steve Wallace LEVEL I DATE 10-9-93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 122303A
PAGE 2 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-218 WELD 1

INSTRUMENT

Model USK-7
Serial No. 27276-784
Sweep Length 8.66 Delay 2.78
Range 2.5"
Gain (coarse) ± 20 / 20 = dB
Gain (fine) ± 8 / 10 = dB
Reference Sensitivity ± 28 / 30 = dB
Remarks: N/A

SEARCH UNIT

Serial No. A07680
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-36
"T" 1.2" Dia. 14"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .6"
Remarks 6" SCREEN RANGE

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

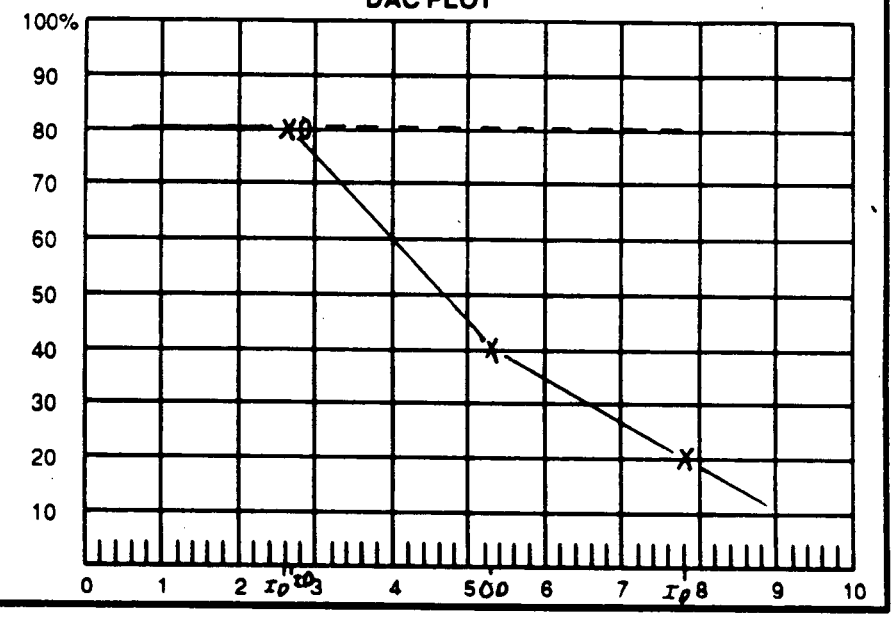
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1530
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1636

REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS 1 Tim Oldham LEVEL II DATE 10-9-93
2 Steve Wollum LEVEL I DATE 10-9-93

REVIEWERS 1 Scott Long LEVEL III DATE 10-11-93
2 Richard B. Weber LEVEL N/A DATE 10/14/93
3 R Valladares LEVEL ANII DATE 10/15/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-031
PAGE 3 OF 5

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-218 WELD 1

INSTRUMENT

Model USK-7
Serial No. 27276-807
Sweep Length 9.22 Delay 2.90
Range 2.5"
Gain (coarse) = 20 / 20 ± dB
Gain (fine) = 22 / 28 ± dB
Reference Sensitivity = 42 / 48 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. M15116
Size .5"
Frequency 1.5 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-36
"T" 1.2" Dia. 14"
Temperature 85 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .8"
Remarks 8" SCREEN RANGE

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

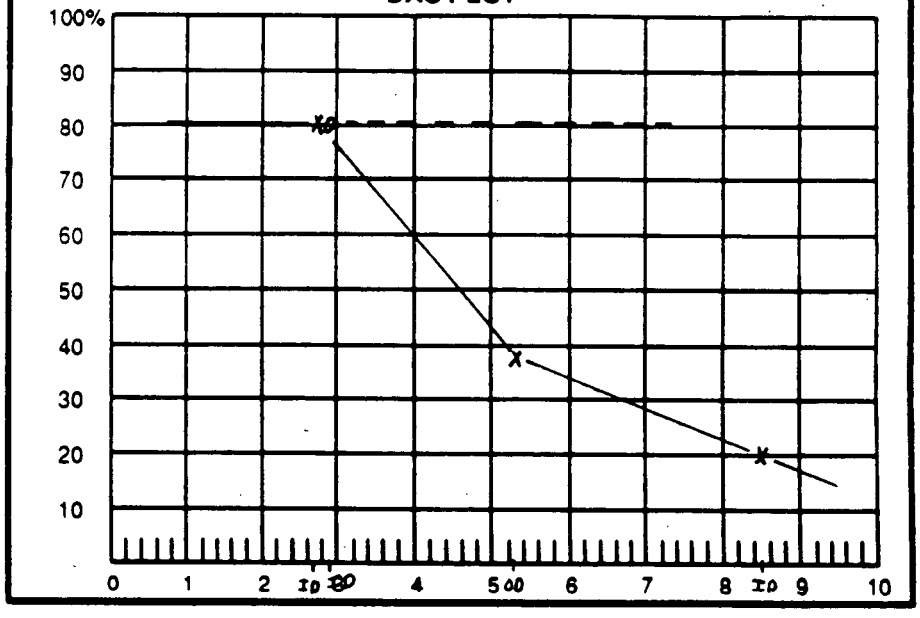
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1536
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1633

REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS	1	Tim Addison	LEVEL II	DATE	10-9-93
	2	Steve Wallum	LEVEL I	DATE	10-9-93
REVIEWERS	1	Scott Klein	LEVEL III	DATE	10-11-93
	2	Richard B. Weber	LEVEL N/A	DATE	10/11/93
	3	R. Wallace	LEVEL ANII	DATE	10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-031
PAGE 4 OF 5
EXAM ITEM

WELD 1 + 2.5T L.S

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14" RHR TAKE OFF
ISO/DWG. NO. CPL-218 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 73 ° F

SCAN 0 ° SCAN dB 24				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: UNABLE TO CALIBRATE 0° ON COMPONENT BECAUSE OF UNEVEN SURFACE. 0° CALIBRATION PERFORMED ON CAL BLOCK CPL-36

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N
A

EXAMINERS:
1 Tim Olson LEVEL II DATE 10-9-93
2 Steve Wollum LEVEL I DATE 10-9-93

REVIEWERS:
1 LEVEL III DATE 10-11-93
2 LEVEL N/A DATE 10/4/93
3 R Valladares LEVEL ANII DATE 10/12/93

nes NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 14" RHR TAKE OFF
ISO/DWG. NO. CPL-218 REV. 0
THERMOMETER S/N MR92-03
COMPONENT TEMP. 73 ° F

EXAM ITEM

WELD 1 + 2.5 T.L.S.

SCAN 45 ° SCAN dB 38				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE, PIPE SIDE ONLY.

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE SIDE ONLY.

SCAN 60 ° SCAN dB 58				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE, PIPE SIDE ONLY.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE SIDE ONLY.

EXAMINERS:
1 Tim Addison LEVEL II DATE 10-9-93
2 Steve Wollum LEVEL I DATE 10-9-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL AN II DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-033
PAGE 1 OF 8 SL 10-11-93
CPL-218 REV. 0, Weld No. 2

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer
Serial No. 27276-749
Sweep Length 4.96 Delay 7.42
Range .5
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks:

SEARCH UNIT (2-2-94)

Serial No. H28182I
Size .25
Frequency 5.0 MHz
Mode Longitudinal
Nom. Angle 0 °
Measured Angle N/A °
Cable Type Potted to BNC
Cable Length 5'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" .443 Dia. 14.0
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X]
Each Major Screen Div. = .1
Remarks 1.0" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

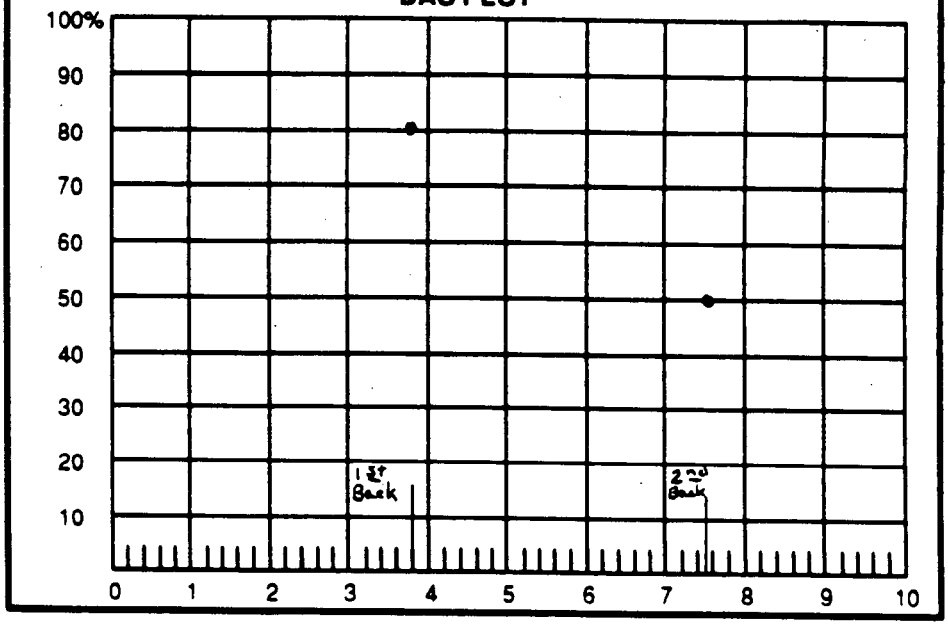
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	79
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1405
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1420

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/9/93
2 [signature] LEVEL III DATE 10/9/93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ANII DATE 10/11/93

Transducer S/N corrected, Verified with examiner Cliff Anderson.
[signature] 2-1-94

NES 9/80 - REV 1

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-083
PAGE 2 OF ~~6~~ 8 SL 10-11-93
CPL-218 REV.0, Weld No.2

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-749
Sweep Length 7.30 Delay 7.47
Range .5
Gain (coarse) 3/4⊥20/3/4=20/½=20 dB
Gain (fine) 3/4⊥16/3/4=24/½=26 dB
Reference Sensitivity 36/44/46 dB
Remarks: N/A

SEARCH UNIT

Serial No. E24700
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-35
"T" .443 Dia. 14
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1
Remarks 1.0" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

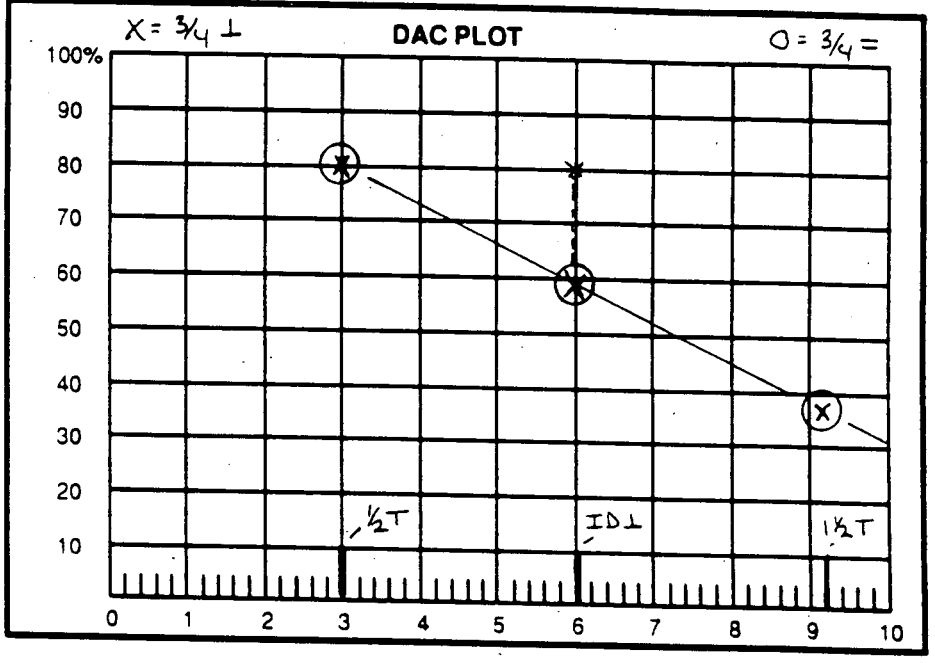
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	79
20	+12	78

CAL. CHECKS

	TIME
INITIAL CAL.	0845
INTERMEDIATE	N/A
INTERMEDIATE	1223
INTERMEDIATE	N/A
FINAL CAL.	1315

DAC PLOT



REMARKS: Same locations for circ reflectors
Ax Scan -6dB tohring ID Notch to DAC
Circ Scan Notch Falls at Dac
N/A

EXAMINERS 1 _____ LEVEL III DATE 10/9/93
2 _____ LEVEL II DATE 10-9-93
REVIEWERS 1 _____ LEVEL III DATE 10-11-93
2 _____ LEVEL N/A DATE 10/11/93
3 _____ LEVEL ANII DATE 10/11/93

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CPL-218 REV.0, Weld No. 2

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-749
Sweep Length 5.22 Delay 7.54
Range 2.5
Gain (coarse) 40 dB
Gain (fine) 6 dB
Reference Sensitivity 46 dB
Remarks:

SEARCH UNIT

Serial No. E24700
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35" To Tip of Wedge

CALIBRATION BLOCK

No. CPL-35
"T" .443 Dia. 14
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .25
Remarks 2.5" Screen Range

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

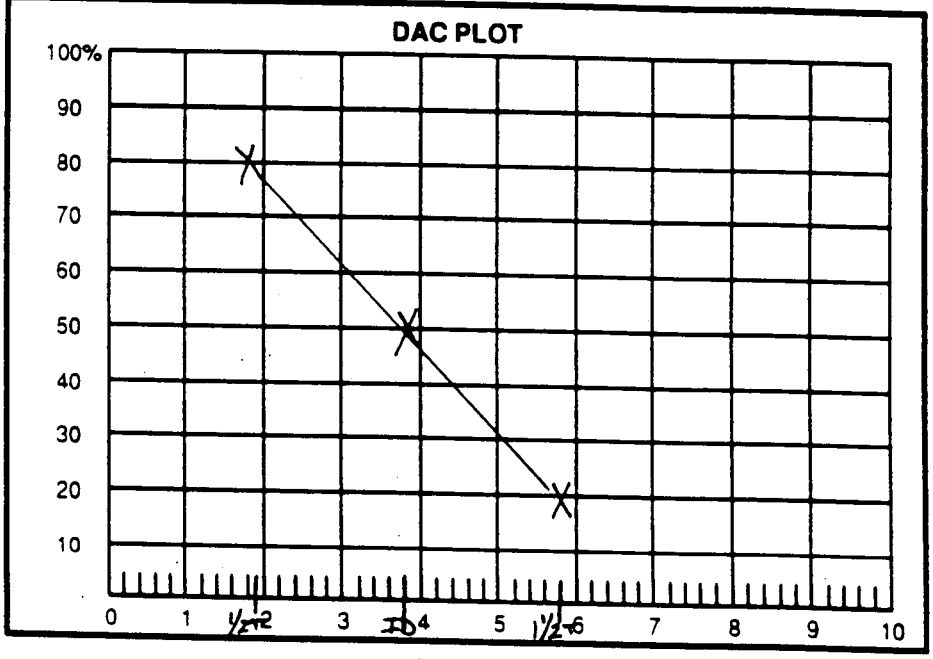
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	79
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1345
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1405

DAC PLOT



REMARKS: 3/4 V Exam +12 dB to bring ID Notch to Dac

EXAMINERS 1 [signature] LEVEL III DATE 10/9/93
2 [signature] LEVEL II DATE 10-9-93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL AN II DATE 10/11/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-033
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CPL-218 REV. 0, Weld No. 2

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-749
Sweep Length 5.22 Delay 7.54
Range 2.5
Gain (coarse) 40 dB
Gain (fine) 20 dB
Reference Sensitivity 60 dB
Remarks: N A

SEARCH UNIT

Serial No. E24700
Size .25
Frequency 2.25 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35" To Tip of wedge

CALIBRATION BLOCK

No. CPL-35
"T" .443 Dia. 14
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. X
Metal Path X Depth N/A
Each Major Screen Div. = .25
Remarks 2.5 Screen Range N A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

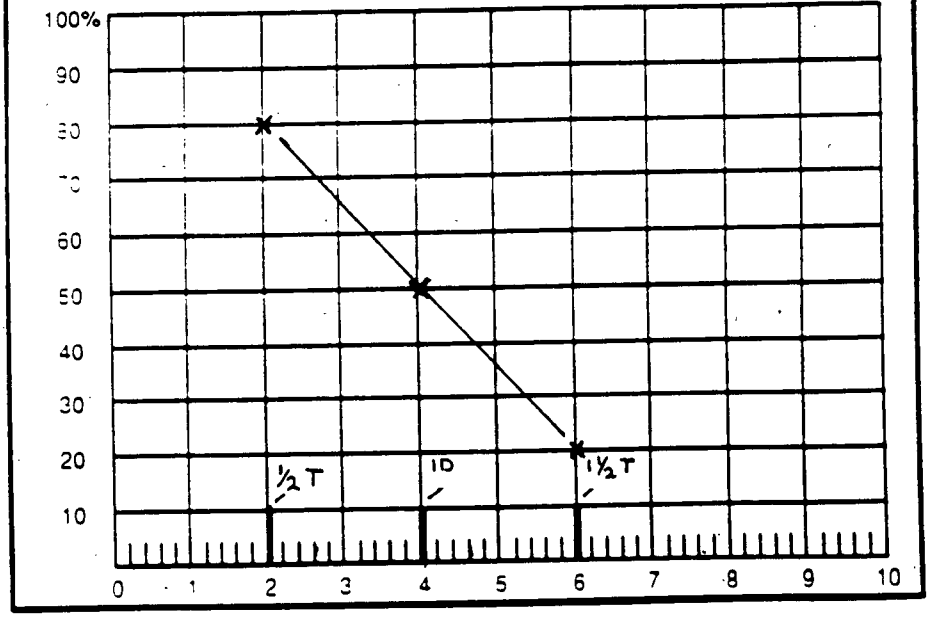
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	21
40	+6	79
20	+12	78

CAL. CHECKS

	TIME
INITIAL CAL.	1355
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1417

DAC PLOT



REMARKS: ¾ V Exam / +12 db to bring ID notch to DAC on Axial, +6 db to bring ID notch to DAC on Circ. N A

EXAMINERS 1 [signature] LEVEL III DATE 10/9/93
2 [signature] LEVEL II DATE 10-9-93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL A/II DATE 10/11/93

DATA SHEET NO. 223-033

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EXAM ITEM

CPL-218 Weld#2

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM

ISO/DWG. NO. CPL-218 REV. 0

THERMOMETER S/N 962

COMPONENT TEMP. 85 ° F

SCAN 0 ° SCAN dB 30				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:

1 LEVEL III DATE 10/9/93

2 LEVEL II DATE 10-9-93

REVIEWERS:

1 Richard O Weber LEVEL N/A DATE 10/11/93

2 LEVEL ANII DATE 10/11/93

3 LEVEL DATE

NES 9/90 – REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-033
PAGE 6 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM
ISO/DWG. NO CPL-218 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 85 °F

EXAM ITEM

CPL-218 Weld #2

SCAN 45° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

SCAN 45° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

SCAN 60° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

SCAN 60° SCAN dB 70				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

EXAMINERS:
1 _____ LEVEL III DATE 10/9/93
2 _____ LEVEL II DATE 10-9-93

REVIEWERS:
1 _____ LEVEL N/A DATE 10/11/93
2 _____ LEVEL ANII DATE 10/11/93
3 _____ LEVEL _____ DATE _____

EXAM ITEM

Weld No. 2

ISO/DWG. NO.

CPL-218 REV. 0

ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-037

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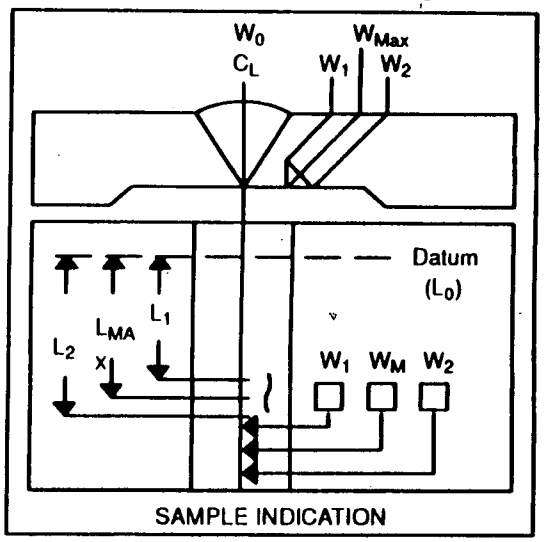
SC 10-11-93

SEARCH UNIT ANGLE 60 ° W_0 LOCATION CL of Weld L_0 LOCATION TDC



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	100%	.80	.95	N/A	N/A	N/A	N/A	N/A	TDC	N/A	N/A	US	See attached sketch for profile
2	100%	.77	.85	N/A	N/A	N/A	N/A	N/A	3.0	N/A	N/A	DS	
							N						N
							A						A

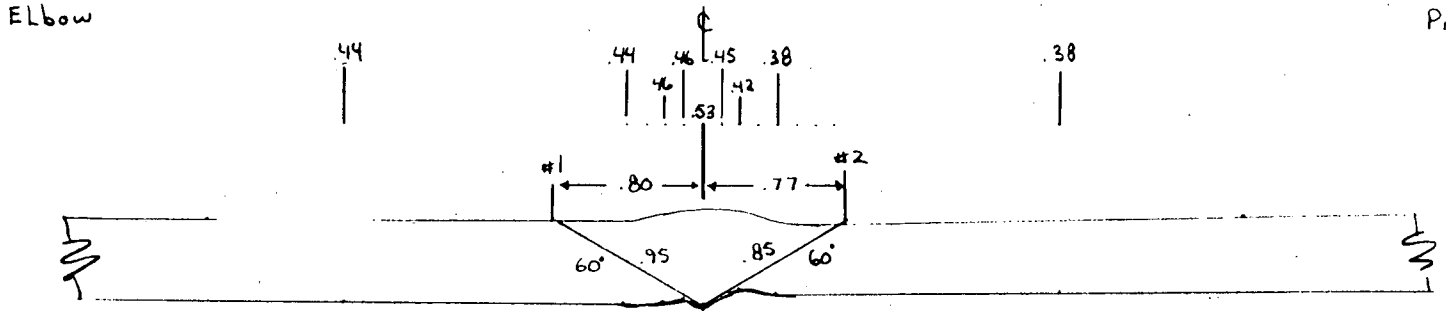
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	[signature]	LEVEL III	DATE 10/9/93
	2	[signature]	LEVEL II	DATE 10-9-93
REVIEWERS	1	[signature]	LEVEL [illegible]	DATE 10-11-93
	2	[signature]	LEVEL N/A	DATE 10/11/93
	3	[signature]	LEVEL ANII	DATE 10/11/93

NES 990

NUCLEAR ENERGY SERVICES, INC.

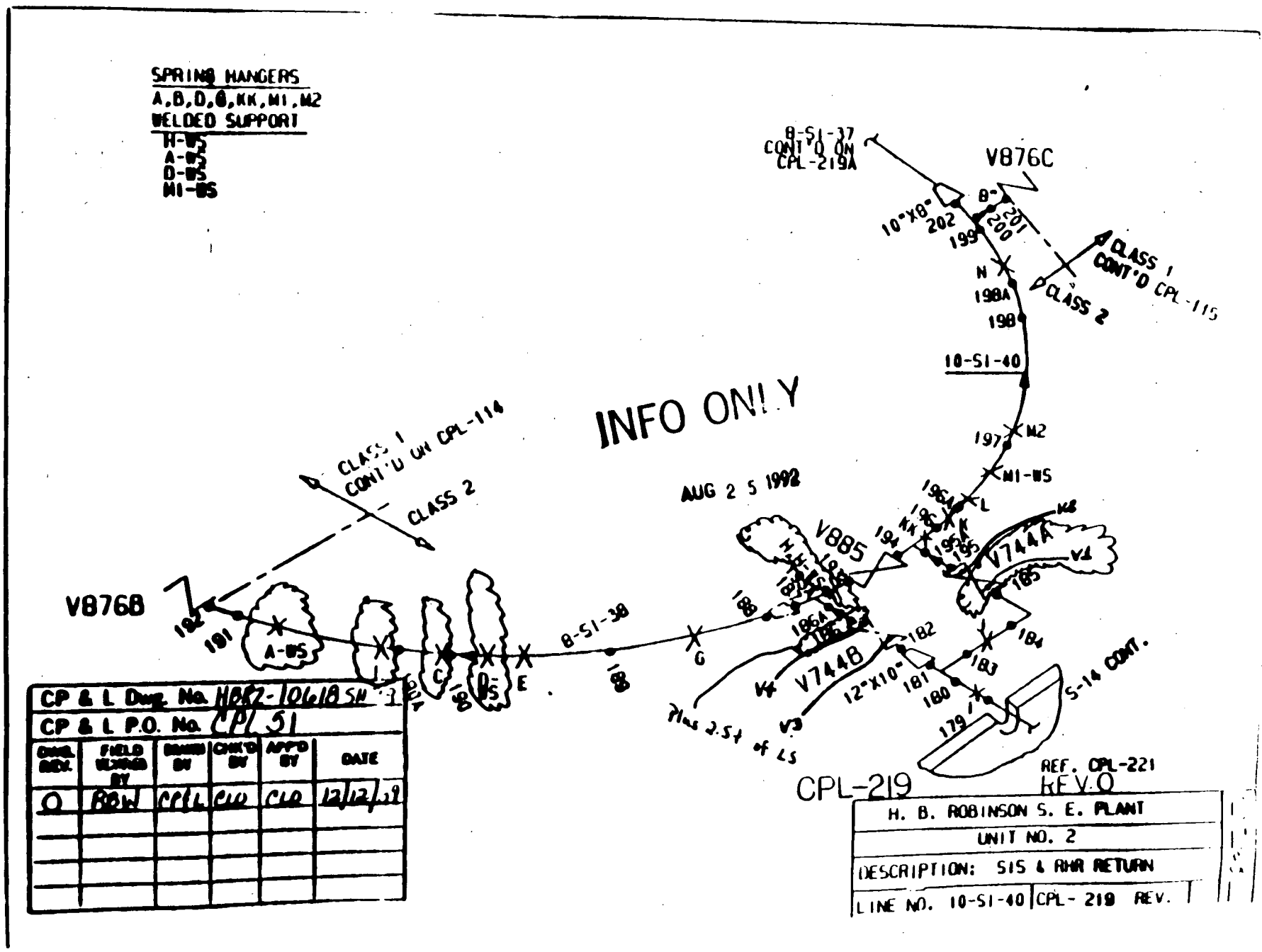
CPL-218 REV.0
Weld No.2



Root Geometry
Seen 360° Intermittant
at Varying Amplitudes

Examiner: [signature] Level: ~~III~~ Date: 10/9/93

Examiner: C D. Judd Level: II Date: 10-9-93



I certify that the Class 1 and 2 portions of piping and supports shown on this drawing conform to the requirements of Section III, Division 1 of the ASME Boiler and Pressure Vessel Code.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-026
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: VAR; ABLE Support	Component ID: 219 A
Drawing/Location: CPL-219 R/O / RX Bldg. -228' Elev. on Crane WALL		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

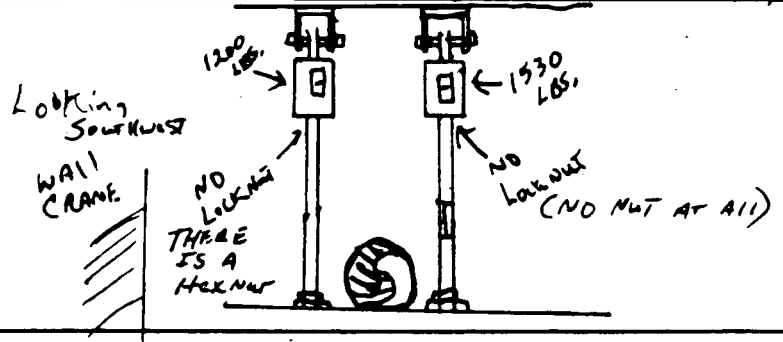
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 1200 LBS (Near Mush. to Mezzanine wall)		After → 1530 LBS
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Reviewed: [signature] 10-4-93

(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CI

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Malladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-036
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: VARIABLE Support	Component ID: 219B
Drawing/Location: CPL-21940 / RX. Bldg. 228' F.W. OUTER ANNULUS		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2138 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: Level: Date:

Comments:
NO INDICATIONS NOTED

Reviewed: [signature] 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

RVW RP Valladares 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-022
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 219C
Drawing/Location: CPL-219 R/O / Rx Hdg. - 228' N/W. Crane wall		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

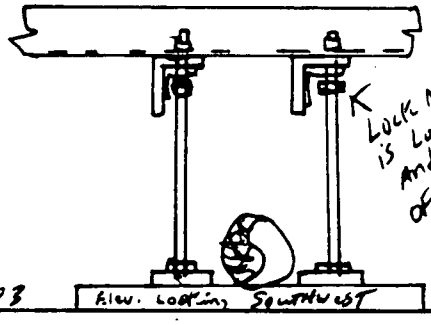
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	~~10-2-93~~	✓	~~10-2-93~~ 11-10-93
Loose/missing parts	✓		LOCKNUT LOOSE (Can Be HAND TURNED)
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Reviewed [signature] LEVEL III 10-6-93

(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-035
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: ST	Component Name: Variable Support	Component ID: 219 D
Drawing/Location: CPL-219-R/D / Rx. Bldg. 228' OUTER ANNULUS		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: CRANE WALL Side 1100 LBS. OTHER 900 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

Reviewed: [signature] Level II 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-013
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒ SI-2-1366

System: RHR	Component Name: Support/Hanger	Component ID: 219-H
Drawing/Location: CPL-219 R/0		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9/13/93

Examiner: [signature] Level: II Date: 9-13-93

Comments: NO INDICATIONS NOTED

Reviewed: Scott Lam LII 9-29-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/29/93

QA NDE ISI 11, Rev. 0, 07/93

AN II A. Palladares 9-25-93

DATA SHEET NO. 1217-043
THERMOMETER S/N JL91-03
TEMPERATURE 81 ° F
NOMINAL THICKNESS 1.125 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED SIS + RHR Return ISO/DWG/SK. # CPL-219 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld V1	No Recordable Indications	X	N/A
Weld 186	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd/CDJ Level II Date 10-3-93
EXAMINER Benjamin Sadler Level I Date 10-3-93
REVIEWER Scott Lamm Level III Date 10-4-93
REVIEWER Richard B. Weber Date 10/5/93
REVIEWER ANH P Valladares Date 10/5/93

DATA SHEET NO. 1217-033
THERMOMETER S/N MB92-04
TEMPERATURE 84 ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL SS
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED SIS + RHR RETURN ISO/DWG/SK. # CPL-219 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "H-WS" TOP	NO INDICATIONS NOTED	X	N/A
" " BOTTOM	" " "	X	
N/A	N/A	N/A	

EXAMINER Kenneth L. Hance LEVEL II DATE 9/30/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Kamp LEVEL III DATE 10-1-93
REVIEWER Richard D. Weber DATE 10/2/93
REVIEWER Anil Palladam DATE 10/5/93

DATA SHEET NO. 1223-010
PAGE 1 OF 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

CPL-219
WELD 186 + 2.5T L.S.

INSTRUMENT

Model USK-7
Serial No. 27276-3702
Sweep Length 8.60" Delay 8.24
Range 2.5"
Gain (coarse) =20 / 20 ⊥ dB
Gain (fine) = 10 / 6 ⊥ dB
Reference Sensitivity = 30 / 26 ⊥ dB
Remarks:
N/A

SEARCH UNIT

Serial No. B07680
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: 4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-59
"T" 1.1" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .6"
Remarks
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

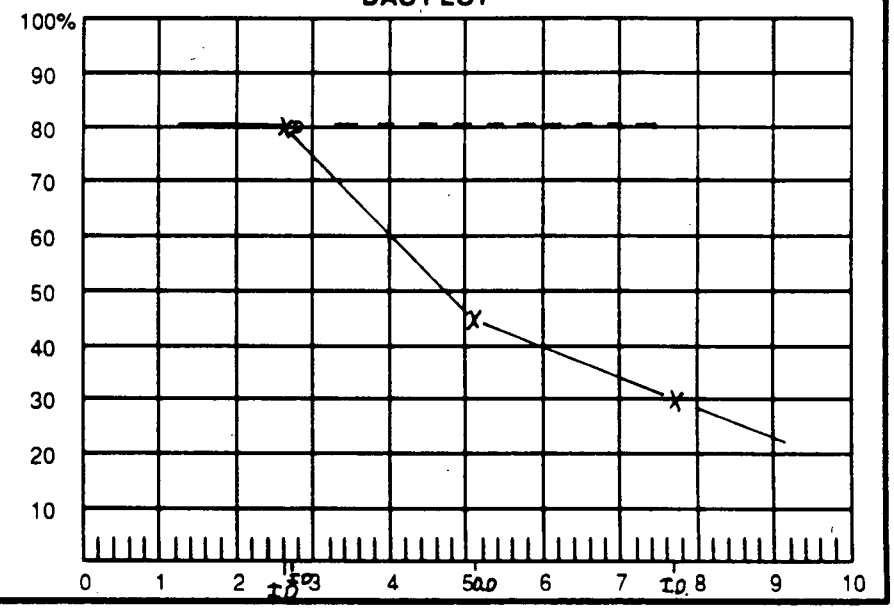
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0910
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1130

REMARKS: X = AXIAL NOTCH
O = CIRC NOTCH

EXAMINERS 1 Tim Oldham LEVEL II DATE 10-4-93
2 Steve Wollyn LEVEL I DATE 10-4-93
REVIEWERS 1 Scott Lowry LEVEL III DATE 10-4-93
2 Michael A. Weber LEVEL N/A DATE 10/5/93
3 A. Wallace LEVEL ANII DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223
PAGE 2 OF 3

CPL-219
WELD 196 +2.5T L.S.

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 9.22 Delay 7.84
Range 2.5"
Gain (coarse) = 20 / 0 ± dB
Gain (fine) = 22 / 34 ± dB
Reference Sensitivity = 42 / 34 ± dB
Remarks: N/A

SEARCH UNIT

Serial No. B25120
Size .5"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .5" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-59
"T" 1.1" Dia. 10"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .8"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

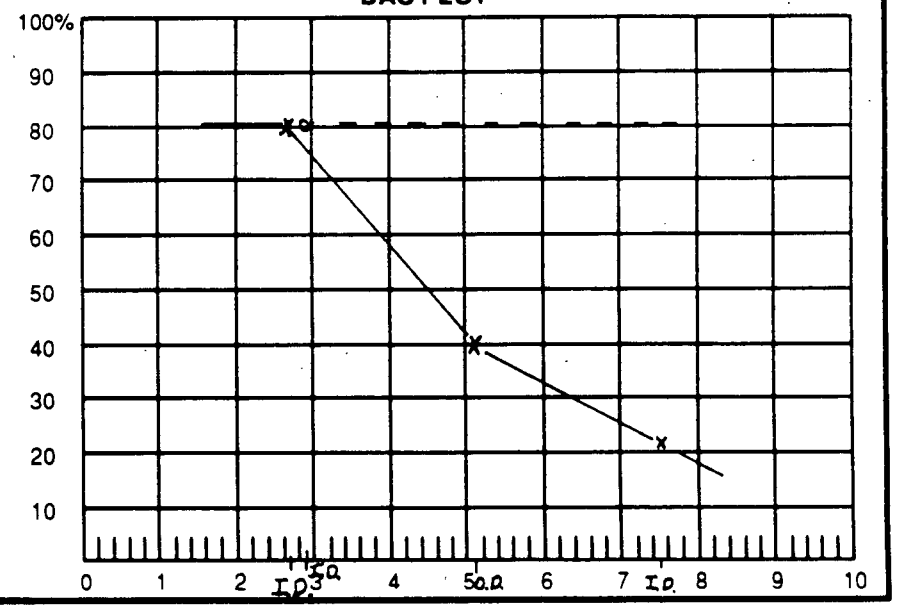
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	−6	40
80	−12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0945
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1135

REMARKS: X = AXIAL NOTCH
O = CIRC. NOTCH

EXAMINERS	1	Tim Oddsen	LEVEL II	DATE	10-4-93
	2	Steve Wollum	LEVEL I	DATE	10-4-93
REVIEWERS	1	Scott Simpson	LEVEL III	DATE	10-4-93
	2	Richard A. Weber	LEVEL N/A	DATE	10/5/93
	3	R Wallendorf	LEVEL ANII	DATE	10/5/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-010
PAGE 3 OF 3

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM SIS & RHR RETURN
ISO/DWG. NO. CPL-219 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 78 ° F

EXAM ITEM

WELD 186+25+LS

SCAN 45 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE. PIPE SIDE ONLY.

SCAN 45 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE. PIPE SIDE ONLY.

SCAN 60 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE. PIPE SIDE ONLY.

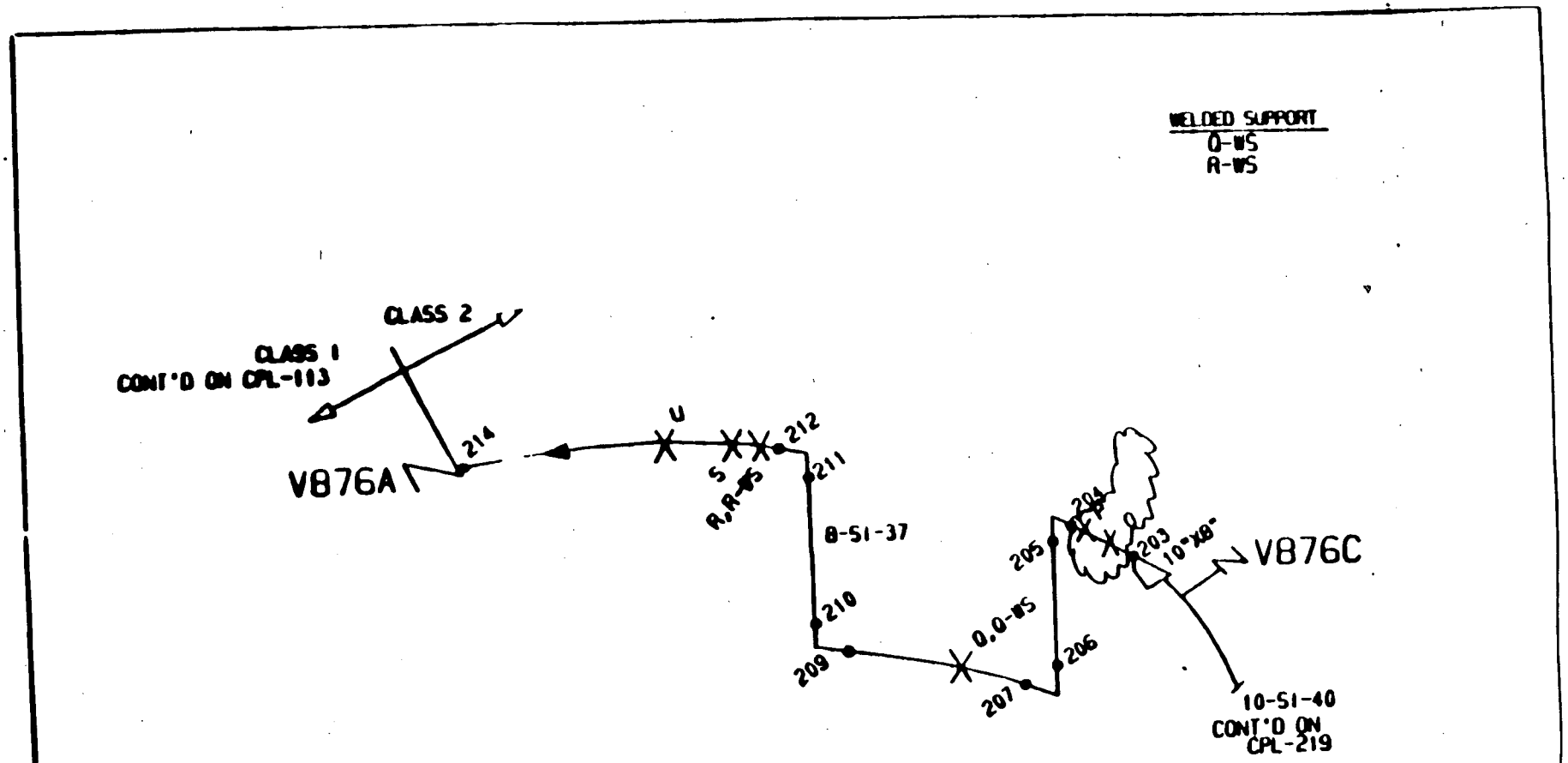
SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: SCANNED PIPE TO VALVE. PIPE SIDE ONLY.

EXAMINERS:
1 Tim Addams LEVEL II DATE 10-4-93
2 Steve Wollam LEVEL I DATE 10-4-93

REVIEWERS:
1 Scott Lam LEVEL III DATE 10-4-93
2 Richard B. Weber LEVEL N/A DATE 10/5/93
3 R Wallendorf LEVEL II DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.



AUG 2 5 1992

INFO ONLY

CP & L Dwg. No. HBR2-10618 SH 79					
CP & L P.O. No. CPL5					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/89

CPL-219A REV.0

H. B. ROBINSON S. E. PLANT

UNIT NO. 2

DESCRIPTION: SIS & RHR RETURN

LINE NO. 8-SI-37 [illegible]

CP&L

I certify this is the latest approved CPL drawing of this system as built.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System:	Component Name: Support/Hanger	Component ID: 219A-O
Drawing/Location: CPL-219A R/	/ex. Old. Excell letdown Area - 228' Floor Elev.	
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

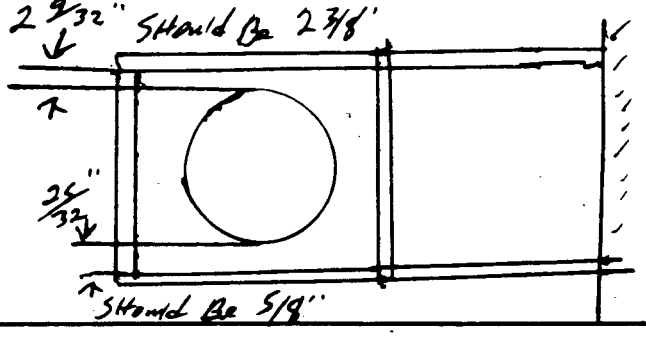
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		See Sketch Below
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Shyam Singh Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-CY-

ISI Reviewer: Richard O. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AN II A Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: SUPPORT/HANGER	Component ID: 219A-P
Drawing/Location: CPL-219A - R/O / Rx. Bldg. - 228' - FLOOR ELEV - EXCESS LETDOWN AREA - 'C' ACCUM S.I.		
☒ VT-3 Procedure: SP-1230 Rev. 0		☐ VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

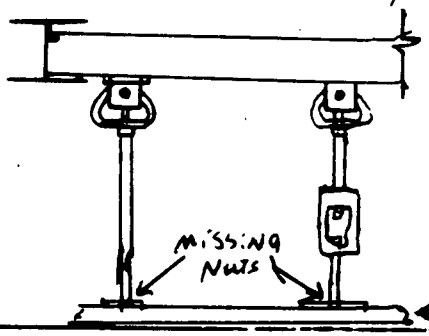
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		See SKETCH BELOW
Loose/missing parts	✓		See SKETCH BELOW
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: [signature] 10/27/93

H. B. ROBINSON
UNIT 2

INTERVAL 3, PERIOD 1, OUTAGE 2
(REFUEL OUTAGE 15)

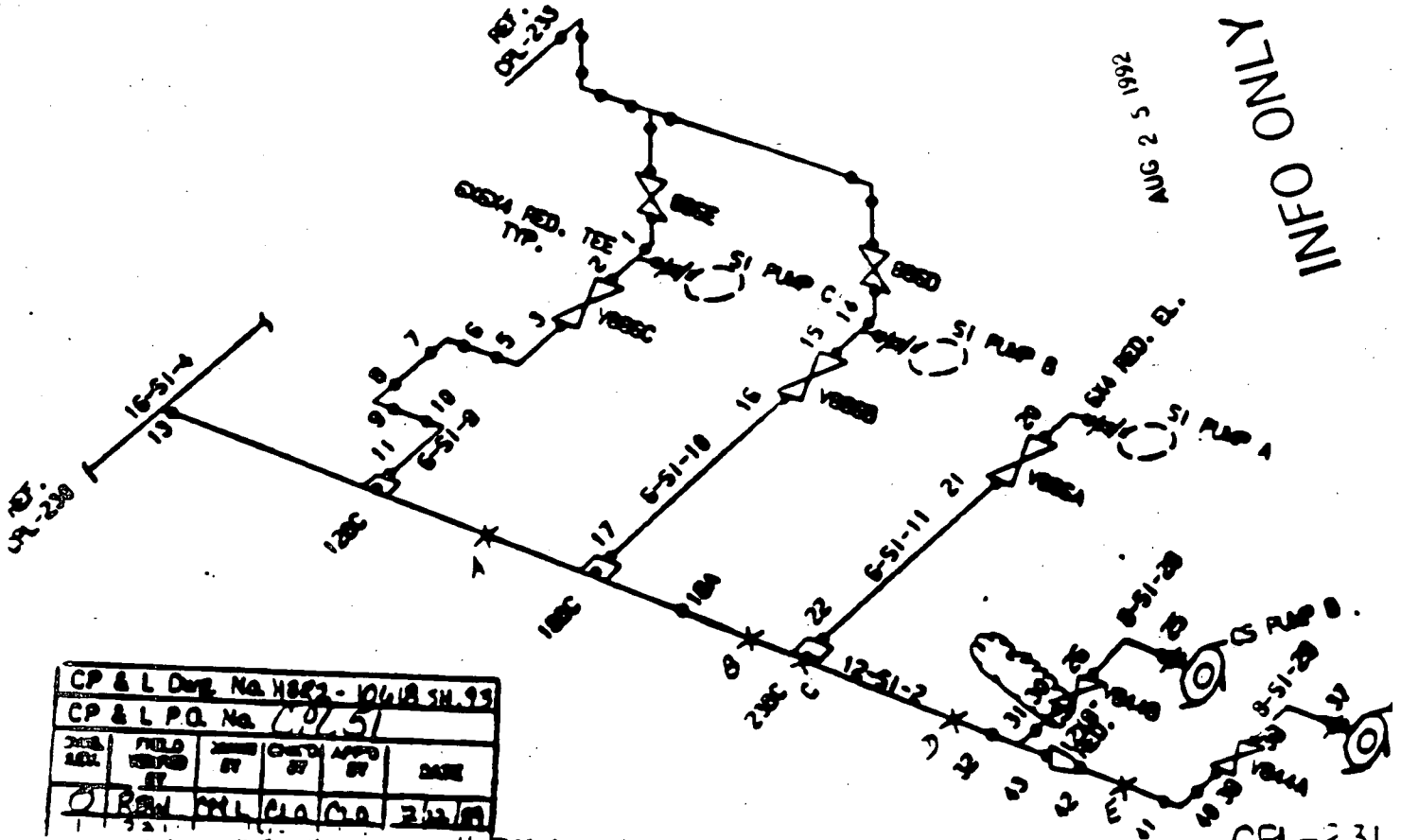
INSERVICE INSPECTION

FINAL REPORT

BOOK 2 OF 3

Prepared for
Carolina Power and Light Company

NES
44 SHELTER ROCK ROAD
DANBURY, CT 06810-7089
(203) 796-5200



CPL 231-324D

DATA SHEET NO. 1223-C24
PAGE 1 OF 7
CPL-231 REV.0, Weld No. 30

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 5.30 Delay 7.85
Range .5
Gain (coarse) 20 dB
Gain (fine) 26 dB
Reference Sensitivity 46 :1
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25
Frequency 5.0 MHz
Mode 0° Longitudinal
Nom. Angle 0 °
Measured Angle 0 °
Cable Type Potted to BNC
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. CPL-67
"T" .148 Dia. 8.0
Temperature 68 °F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X]
Each Major Screen Div. = .05
Remarks .5" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

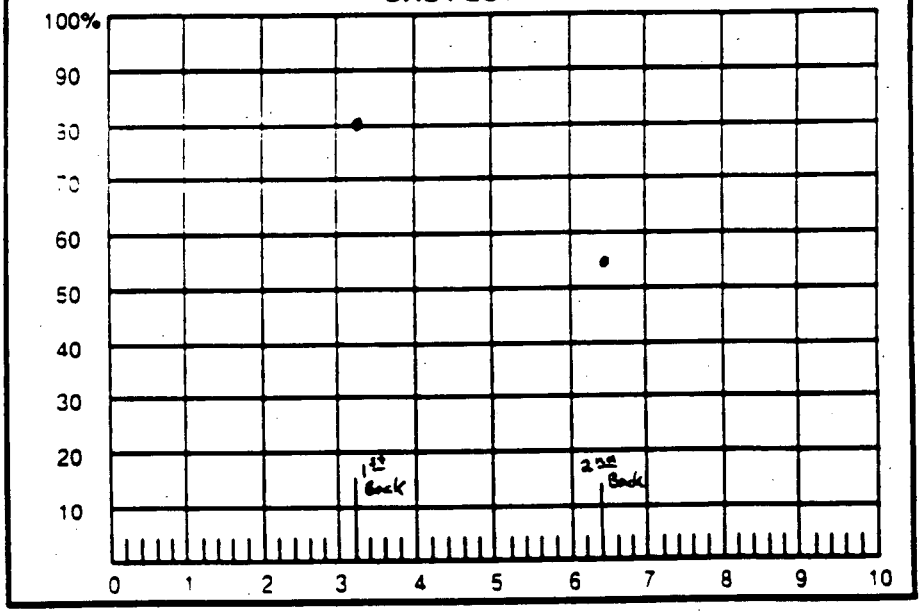
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1055
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1135

REMARKS: N/A

EXAMINERS	1		LEVEL III	DATE 10/8/93
	2		LEVEL II	DATE 10-8-93
REVIEWERS	1		LEVEL III	DATE 10-11-93
	2		LEVEL N/A	DATE 10/12/93
	3		LEVEL ANII	DATE 10/12/93

DATA SHEET NO. 1223-024
PAGE 2 OF 7
CPL-231 REV. 0, Weld No. 30

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 8.98 Delay 7.87
Range .5
Gain (coarse) 20 Axial / 26 Circ dB
Gain (fine) 18 Axial / 26 Circ dB
Reference Sensitivity 38 1/46 = .3
Remarks: N/A

SEARCH UNIT

Serial No. K08505
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35 To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-67
"T" .148 Dia. 8.0
Temperature 67 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1
Remarks 1" Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

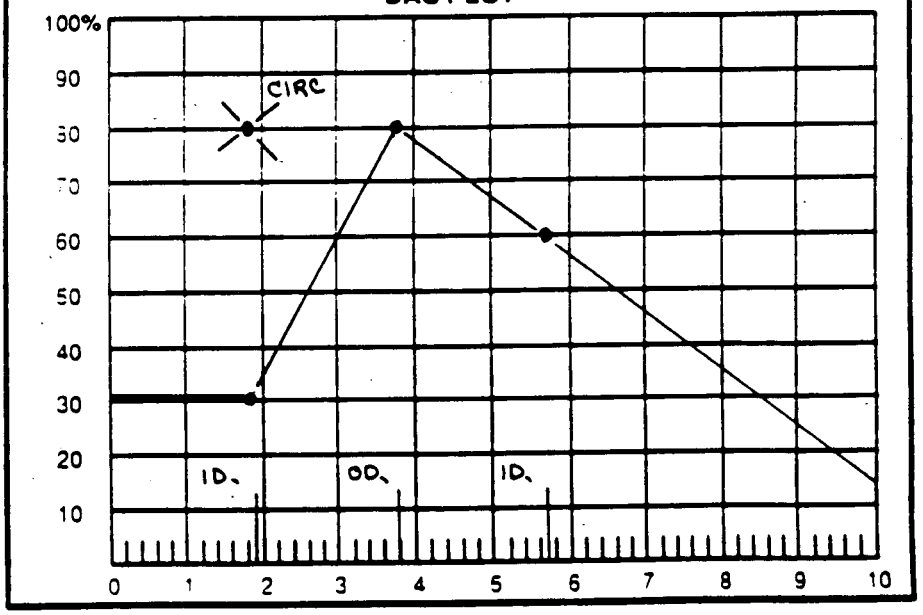
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	40
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	0940
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1130

REMARKS: N/A

EXAMINERS	1		LEVEL III	DATE 10/8/93
	2		LEVEL II	DATE 10-8-93
REVIEWERS	1		LEVEL III	DATE 10-11-93
	2		LEVEL N/A	DATE 10/12/93
	3		LEVEL AWS	DATE 10/12/93

DATA SHEET NO. 1223-024
PAGE 3 OF 7
CPL-231 REV. 0, Weld No. 30

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 7.88 Delay 7.82
Range .5
Gain (coarse) L 20 / 20 = dB
Gain (fine) L 22 / 22 = dB
Reference Sensitivity L 42 / 42 = .3
Remarks: N/A

SEARCH UNIT

Serial No. F11506
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 60°
Measured Angle 60°
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35 To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-67
"T" .148 Dia. 8.0
Temperature 67 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [ ] Depth [ ]
Each Major Screen Div. = .1
Remarks 1" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

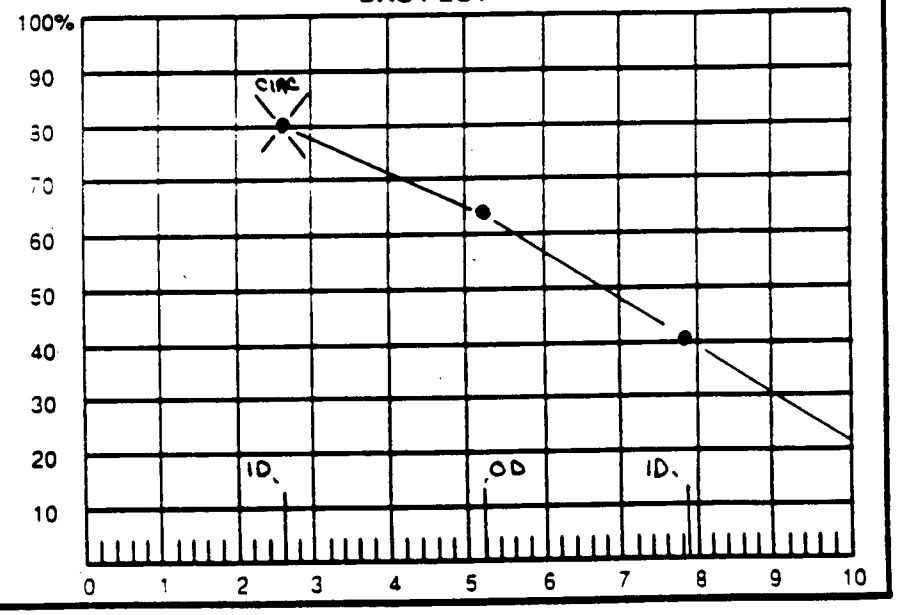
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1010
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1115

REMARKS: N/A

EXAMINERS 1 _____ LEVEL III DATE 10/8/93
2 _____ LEVEL II DATE 10-8-93

REVIEWERS 1 _____ LEVEL III DATE 10-11-93
2 _____ LEVEL N/A DATE 10/12/93
3 _____ LEVEL AN II DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-024
PAGE 4 OF 7

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CV Spray
ISO/DWG. NO. CPL-231 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 76 ° F

EXAM ITEM

Weld No. 30

SCAN 45 ° SCAN dB 44				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, Pipe Side

N A

SCAN 45 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A	X	N/A

REMARKS: Scan on one side of weld only, Pipe side
See attached sketch for profile

N A

SCAN 60 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, Pipe side

N A

SCAN 60 ° SCAN dB 48				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, Pipe side

N A

EXAMINERS:
1 [signature] LEVEL III DATE 10/8/93
2 [signature] LEVEL II DATE 10-8-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL 4/A DATE 10/12/93
3 [signature] LEVEL ANII DATE 10/12/93

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-024

PAGE 5 OF 7

EXAM ITEM

Weld No. 30

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CV Spray

ISO/DWG. NO. CPL-231 REV. 0

THERMOMETER S/N 962

COMPONENT TEMP. 76 ° F

SCAN 0 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Scan on one side of weld only, pipe side

N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

EXAMINERS:

1 LEVEL III DATE 10/8/93

2 D. Judd LEVEL II DATE 10-8-93

REVIEWERS:

1 LEVEL III DATE 10-11-9

2 LEVEL N/A DATE 10/12/9

3 R Valladares LEVEL ANII DATE 10/12/9

nes NUCLEAR ENERGY SERVICES, INC.

NES 9/90 - REV. 1

EXAM ITEM

Weld No. 30

ISO/DWG. NO.

CPL-231 REV. 0

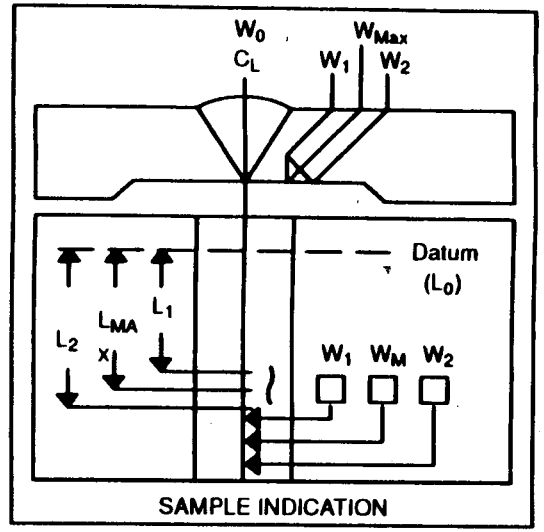
ULTRASONIC INDICATION REPORT SHEET

- [X] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER _____

DATA SHEET NO. 1223-024

PAGE 6 OF 7

SEARCH UNIT ANGLE 45 ° W_0 LOCATION Datum S (TDC) L_0 LOCATION CL of Weld



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_0 to S.U. at maximum response.
W_1	Distance from W_0 at 50% of DAC (fwd)
W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS
1	50	13.75	.49	13.55	.35	13.85	.58	.20	.40	.60	N/A	CCW	
2	50	13.95	.68	13.85	.61	14.0	.76	.20	.40	.60	N/A	CCW	
3	50	13.40	.31	N/A	N/A	N/A	N/A	N/A	.40	N/A	N/A	N/A	
													N/A

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

See Attached Plot

EXAMINERS 1 _____ LEVEL III DATE 10/8/93

2 _____ LEVEL II DATE 10-8-93

REVIEWERS 1 _____ LEVEL III DATE 10-11-93

2 _____ LEVEL N/A DATE 10/12/93

3 _____ LEVEL ANII DATE 10/12/93

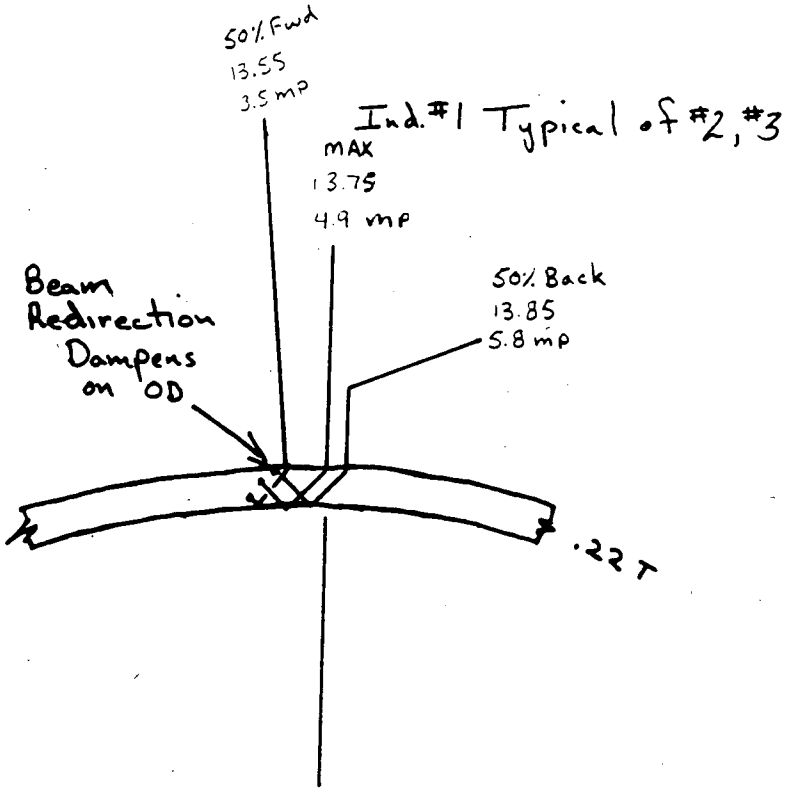
NUCLEAR ENERGY SERVICES, INC.

1223-024

CPL-231 REV.0

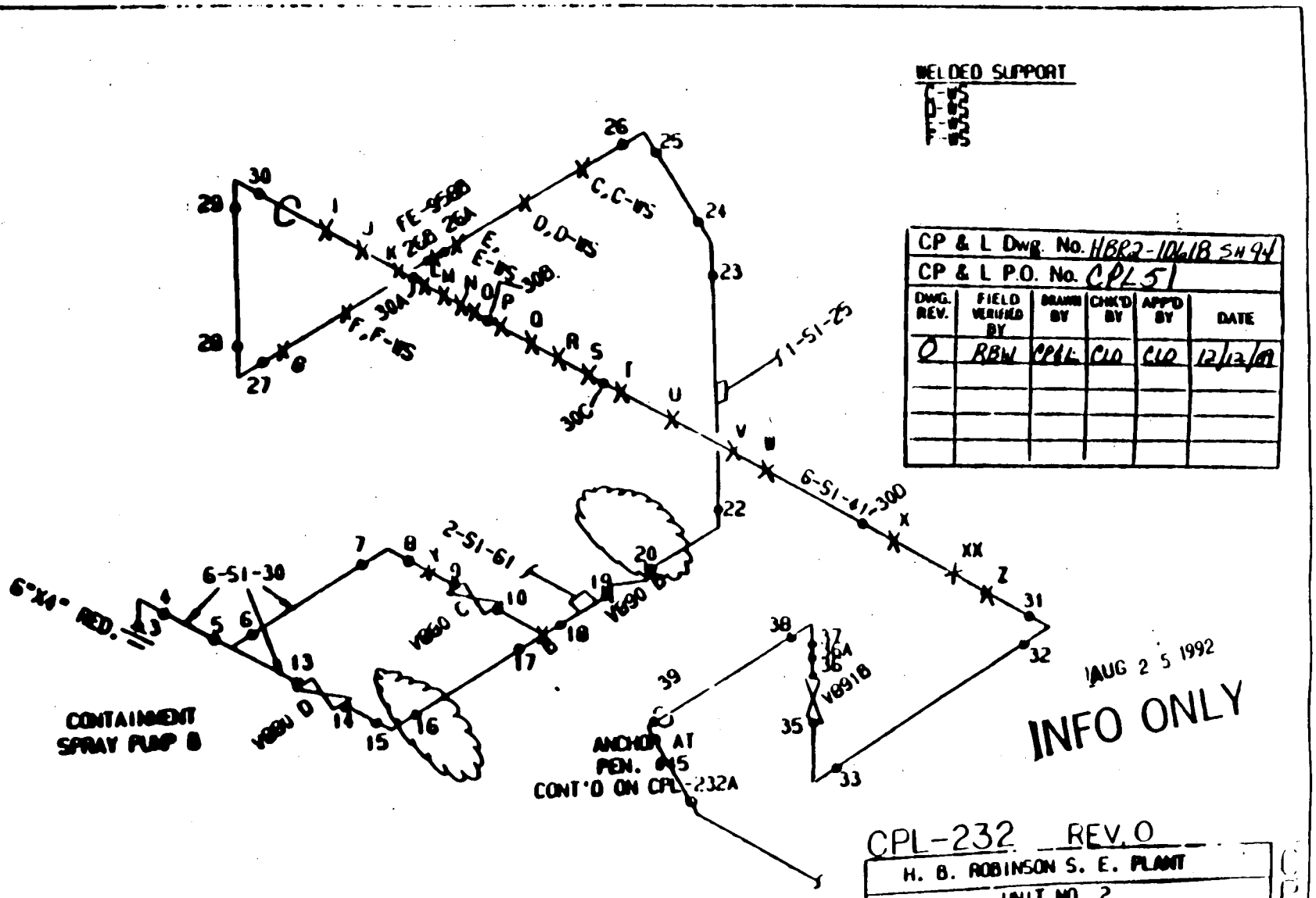
Weld No. 30

45°



Examiner: C. D. Fudel
Level: II
Date: 10-8-93

Examiner: [signature]
Level: III
Date: 10/8/93



CP & L Dwg. No. HBR2-10418 SH 94					
CP & L P.O. No. CPL 51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CLO	CLO	12/12/91

CPL-232 REV. 0

H. B. ROBINSON S. E. PLANT

UNIT NO. 2

DESCRIPTION: CS PUMP B TO HEADERS

CP&

I certify that the Lines contained on this drawing are those required by the Line Designation Table and that the drawing is complete and accurate as built.

DATA SHEET NO. 1223-018
PAGE 1 OF 9

CPL-232
Weld #16

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7S
Serial No. 31459-1499
Sweep Length 5.44 Delay 9.02
Range .5
Gain (coarse) 20 dB
Gain (fine) 16 dB
Reference Sensitivity 36 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25"
Frequency 5 MHz
Mode Long
Nom. Angle 0 °
Measured Angle N/A °
Cable Type Self Contained
Cable Length 6'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" .28" Dia. 6"
Temperature 78 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1"
Remarks N/A

COUPLANT

Brand Ultragel II
Batch No. 093001

VERTICAL LINEARITY

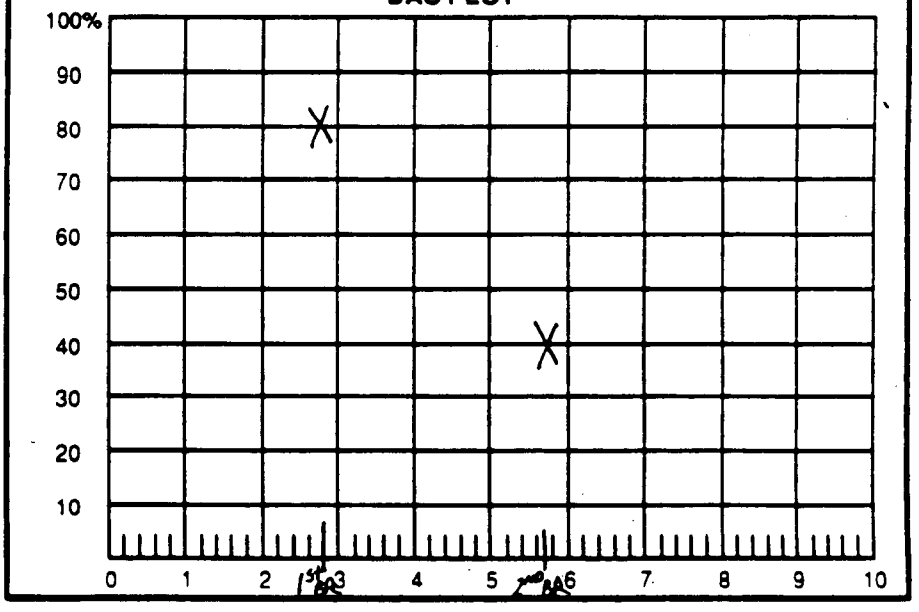
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1400
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1420

REMARKS: N/A

EXAMINERS	1	LEVEL III	DATE 10/5/93
	2	LEVEL I	DATE 10/5/93
REVIEWERS	1	LEVEL III	DATE 10-6-93
	2	LEVEL N/A	DATE 10/7/93
	3	LEVEL ANII	DATE 10/7/93

DATA SHEET NO. 1223-018
PAGE 2 OF 9

CPL-232
WELD-16

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK 7S
Serial No. 31459-1499
Sweep Length 8.38 Delay 9.04
Range .5"
Gain (coarse) 0 dB
Gain (fine) 32 dB
Reference Sensitivity 32 dB
Remarks: N/A

SEARCH UNIT

Serial No. J09185
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MDT RG174/U
Cable Length 6'
Remarks: .25" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-66
"T" .280" Dia. 6"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

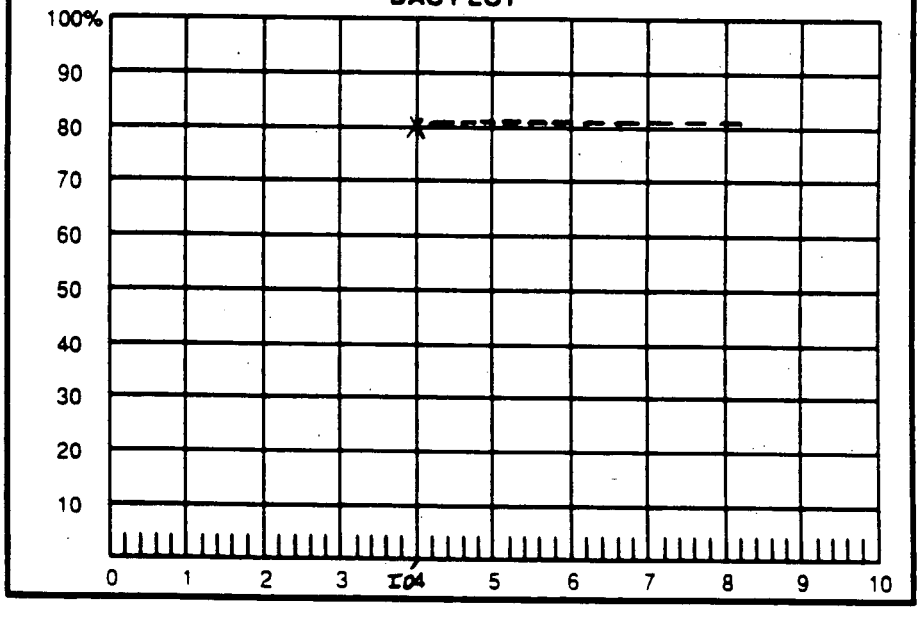
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1545
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1630

REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/5/93
2 [signature] LEVEL I DATE 10/5/93
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AN II DATE 10/7/93

DATA SHEET NO. 1223-018
PAGE 3 OF 9

CPL-232
WELD 16

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK 7S
Serial No. 31459-1499
Sweep Length 363 Delay 9.10
Range 2.5"
Gain (coarse) 0 dB
Gain (fine) 26 dB
Reference Sensitivity 26 dB
Remarks: N/A

SEARCH UNIT

Serial No. J09185
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 45 °
Measured Angle 45 °
Cable Type BNC-MOT RG174/U
Cable Length 6'
Remarks: .25" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-66
"T" .280" Dia. 6"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial [X] Circ. N/A
Metal Path [X] Depth N/A
Each Major Screen Div. = .2"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

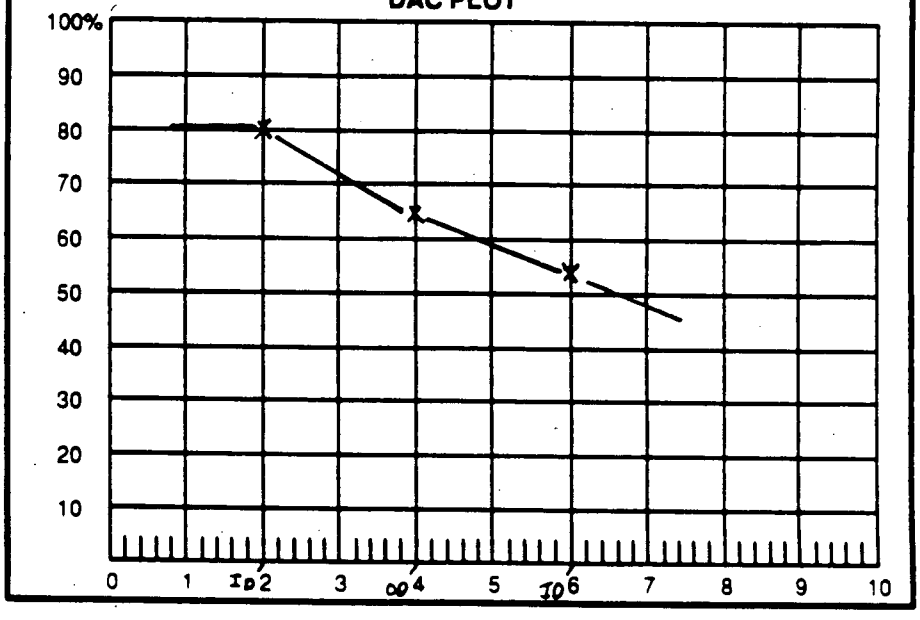
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1430
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1530

REMARKS: N/A

EXAMINERS	1	[signature]	LEVEL III	DATE	10/5/93
	2	Dave Wallum	LEVEL I	DATE	10/5/93
REVIEWERS	1	[signature]	LEVEL III	DATE	10-6-93
	2	[signature]	LEVEL N/A	DATE	10/7/93
	3	[signature]	LEVEL AN II	DATE	10/7/93

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CPL-232
WELD-16

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK 7S
Serial No. 31459-1499
Sweep Length 8.12 Delay 9.97
Range .5"
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. J09185
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type BNC-MOT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE.

CALIBRATION BLOCK

No. CPL-66
"T" .280" Dia. 6"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial N/A Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .1"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

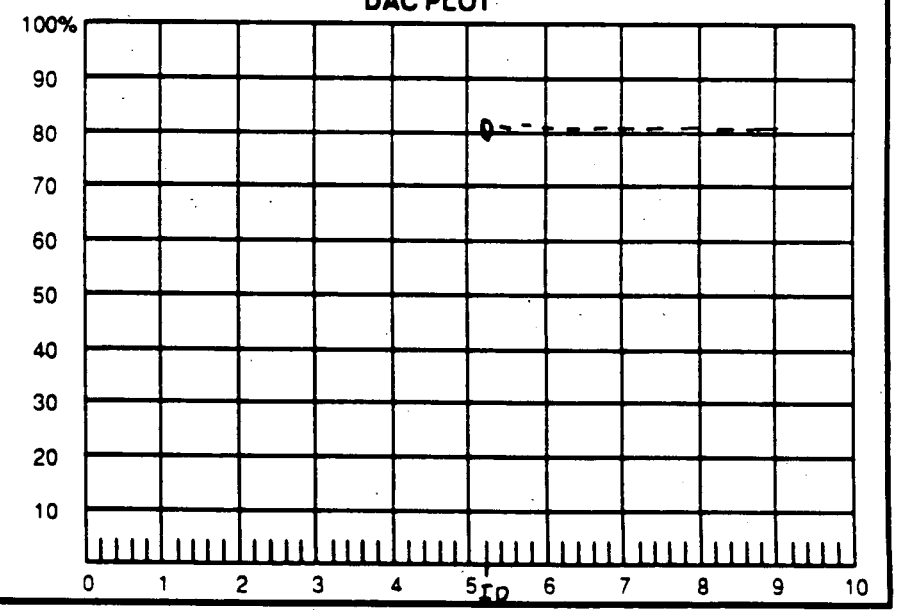
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1640
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1700

REMARKS: N/A

EXAMINERS	1	[signature]	LEVEL III	DATE	10/5/93
	2	Steve Wollam	LEVEL I	DATE	10/5/93
REVIEWERS	1	[signature]	LEVEL III	DATE	10-6-93
	2	Richard B. Weber	LEVEL N/A	DATE	10/7/93
	3	[signature]	LEVEL AUII	DATE	10/7/93

NUCLEAR ENERGY SERVICES, INC.

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CPL-232
WELD-16

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK 7S
Serial No. 31459-1499
Sweep Length 4.80 Delay 9.06
Range 2.5"
Gain (coarse) 20 dB
Gain (fine) 20 dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. J09185
Size .25"
Frequency 2.25 MHz
Mode SHEAR
Nom. Angle 60 °
Measured Angle 60 °
Cable Type BNC-MOT RG174/U
Cable Length 6'
Remarks: .4" EXIT POINT TO FRONT OF WEDGE

CALIBRATION BLOCK

No. CPL-66
"T" .280" Dia. 6"
Temperature 85 ° F
Thermometer S/N 962

CALIBRATION

0° N/A Axial ☒ Circ. N/A
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093001

VERTICAL LINEARITY

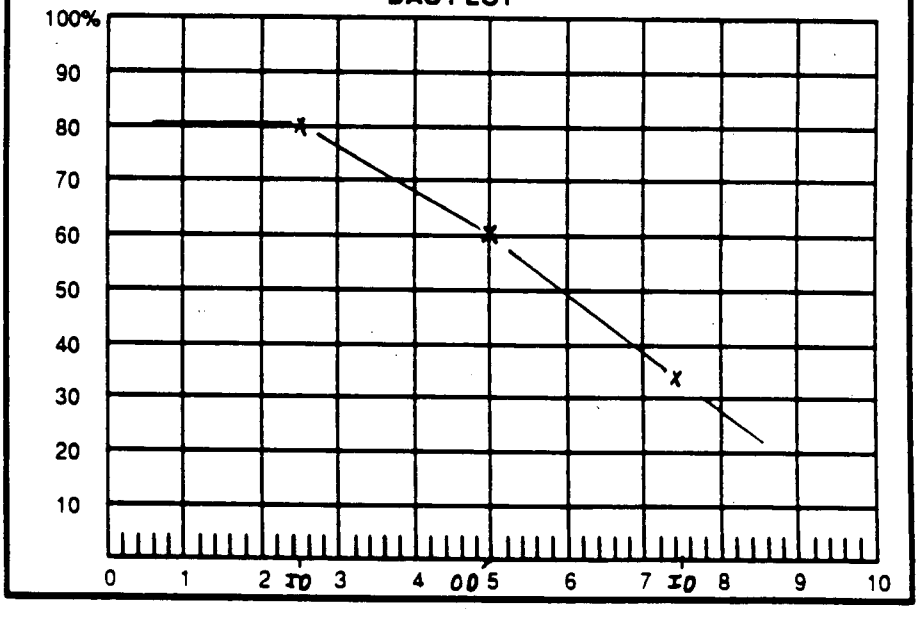
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	1710
INTERMEDIATE	
INTERMEDIATE	N/A
INTERMEDIATE	
FINAL CAL.	1745

REMARKS: N/A

EXAMINERS	1	[signature]	LEVEL III	DATE 10/5/93
	2	Steve Wolbert	LEVEL I	DATE 10/5/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-5-93
	2	[signature]	LEVEL N/A	DATE 10/7/93
	3	[signature]	LEVEL ANII	DATE 10/7/93

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EXAM ITEM

CPL-232
Weld #16

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CS PUMP B TO HEADERS

ISO/DWG. NO. CPL-232 REV. 0

THERMOMETER S/N 962

COMPONENT TEMP. 78 °F

SCAN 0 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
☒	N/A	N/A	N/A	☒	N/A	N/A	☒	N/A	☒	☒	N/A

REMARKS: Complete Elbow to Pipe

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS: N/A

EXAMINERS:
1 LEVEL III DATE 10/5/93
2 Steve Wollum LEVEL I DATE 10/5/93

REVIEWERS:
1 LEVEL III DATE 10-6-93
2 LEVEL N/A DATE 10/7/93
3 R. Valladares LEVEL ANII DATE 10/7/93

NES 9/90 – REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CS PUMP B TO HEADERS
ISO/DWG. NO. CPL-232 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 78 ° F

EXAM ITEM
CPL-232
Weld #16

SCAN 45 ° SCAN dB 36				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides.

Note: Limited on Pipe Side Due to Drain line, Code Required Coverage Achieved from Elbow Side.

SCAN 45 ° SCAN dB 42				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Pipe. Complete Both Sides

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	X	N/A	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

Note: Limited on Pipe Side Due to Drain line, Code Required Coverage Achieved from Elbow Side

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Elbow to Pipe, Complete Both Sides

EXAMINERS:
1 _____ LEVEL III DATE 10/5/93
2 Steve Wollam LEVEL I DATE 10/5/93

REVIEWERS:
1 _____ LEVEL III DATE 10-6-93
2 _____ LEVEL N/A DATE 10/7/93
3 _____ LEVEL 4/11 DATE 10/8/93

EXAM ITEM: Weld #16

ISO/DWG. NO.: CPL-232

ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [ ] FERRITIC VESSELS ≥ 2" T *
- [ ] OTHER N/A

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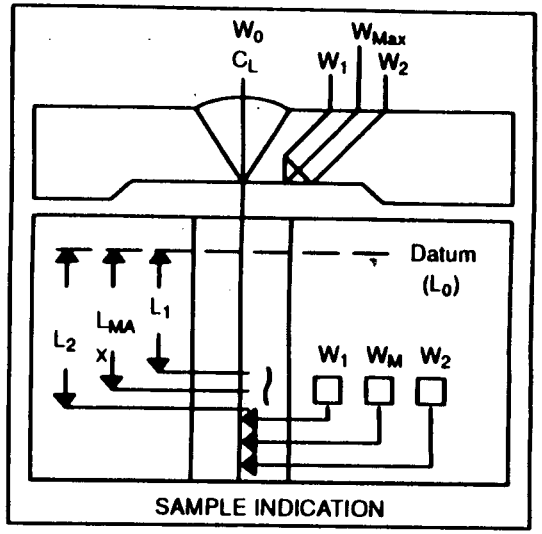
SEARCH UNIT ANGLE 45°/60° W_0 LOCATION ℄ of Weld L_0 LOCATION TDC



SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W MAX W	W MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.
1	60%	.65"	.88"	N/A	N/A	N/A	N/A	*	1"CW	*	N/A	Elbow Side
2	70%	.6"	.77"	N/A	N/A	N/A	N/A	*	1"CW	*	N/A	Pipe Side

REMARKS

Indications #1 and #2 were Both Seen 360° Intermittant at varying Amplitudes. #1 is OD Geometry and Can be Dampened on Weld Crown #2 is Root Geometry Both Verified with a 0° ID Profile and Beam Plot.

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS	1	[signature]	LEVEL III	DATE 10/5/93
	2	[signature]	LEVEL I	DATE 10/5/93
REVIEWERS	1	[signature]	LEVEL III	DATE 10-6-93
	2	[signature]	LEVEL N/A	DATE 10/7/93
	3	[signature]	LEVEL ANII	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

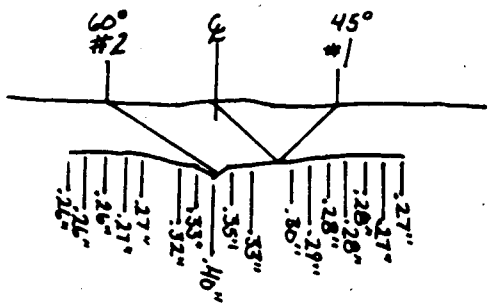
1223-018

CPL-232 Rev. 0
Weld #16

Weld #16

Pipe

Elbow



10/5/93

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PAGE 1 OF 6
CPL-232 REV.0, Weld #17

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-807
Sweep Length 5.03 Delay 7.22
Range .5
Gain (coarse) 20 dB
Gain (fine) 30 dB
Reference Sensitivity 50 dB
Remarks: N/A

SEARCH UNIT

Serial No. L29324
Size .25
Frequency 2.25 MHz
Mode 0° Longitudinal
Nom. Angle 0 °
Measured Angle N/A °
Cable Type Dual SelfContained
Cable Length 5'
Remarks:

CALIBRATION BLOCK

No. Component
"T" .280 Dia. 8.0
Temperature 78 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X]
Each Major Screen Div. = N/A
Remarks N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

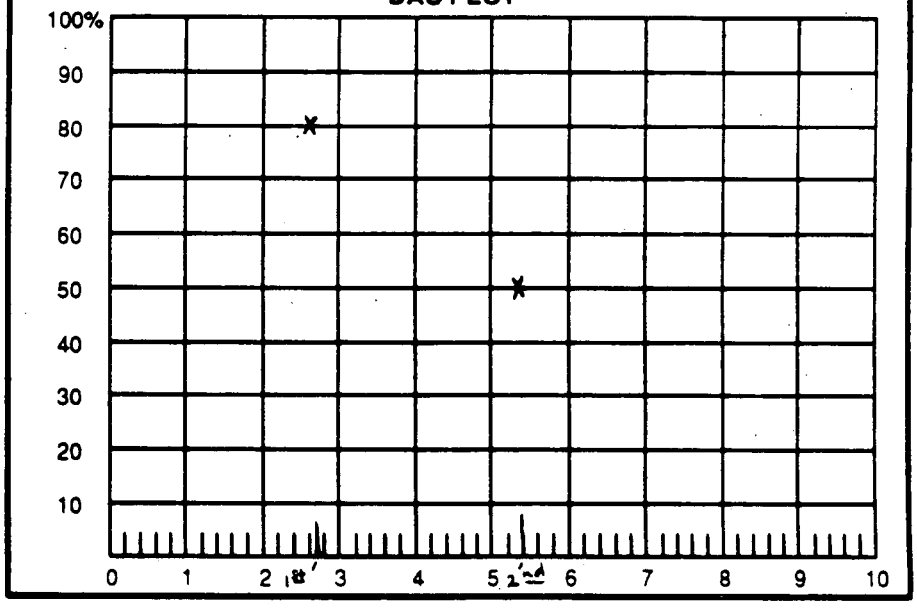
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1530
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1540

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/6/93
2 [signature] LEVEL II DATE 10-6-93
REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AWII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

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PAGE 2 OF 6
CPL-232 REV. 0, Weld No. 17

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-749
Sweep Length 8.97 Delay 7.50
Range .5
Gain (coarse) 20 dB
Gain (fine) 22 dB
Reference Sensitivity 42 dB
Remarks: N/A

SEARCH UNIT

Serial No. F11506
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-66
"T" .280 Dia. 8.0
Temperature 76 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .10
Remarks 1" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

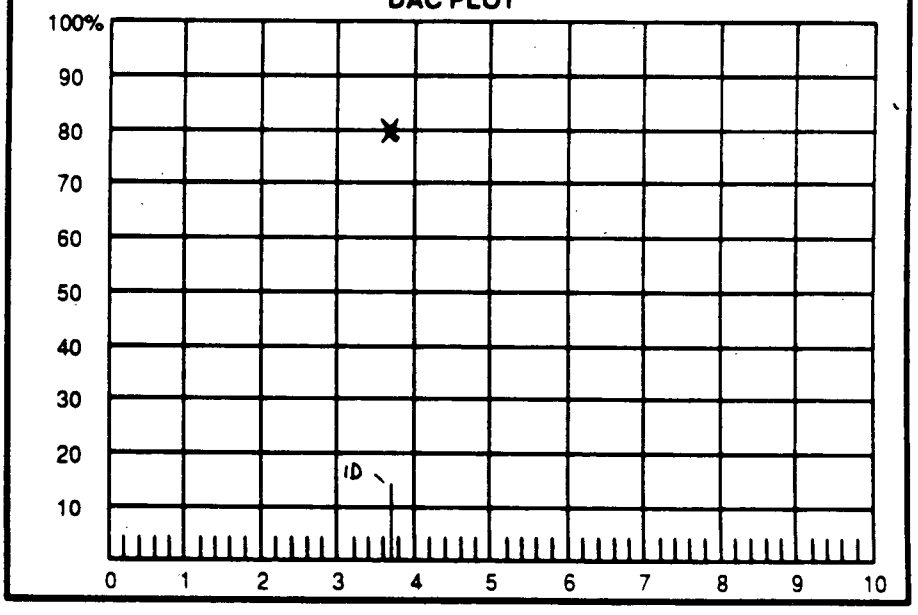
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1519
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1528

DAC PLOT



REMARKS: N/A

EXAMINERS 1 _____ LEVEL III DATE 10/6/93
2 _____ LEVEL II DATE 10-6-93
REVIEWERS 1 _____ LEVEL III DATE 10-6-93
2 _____ LEVEL N/A DATE 10/7/93
3 _____ LEVEL ANII DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

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CPL-232 REV.0, Weld No. 17

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-749
Sweep Length 9.57 Delay 7.69
Range .5
Gain (coarse) 20 dB
Gain (fine) 16 dB
Reference Sensitivity 36 dB
Remarks: N/A

SEARCH UNIT

Serial No. F11506
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-66
"T" .280 Dia. 8.0
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .2
Remarks 2.0 Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

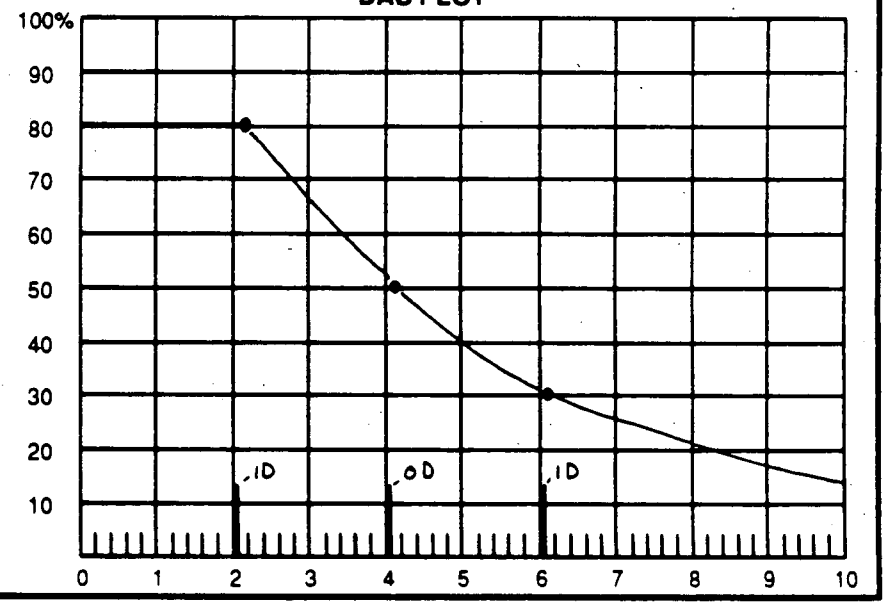
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1400
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1448

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/6/93
2 [signature] LEVEL II DATE 10-6-93

REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AN II DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-017
PAGE 4 OF 6
CPL-232 REV. 0, Weld No. 17

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3784
Sweep Length 8.05 Delay 7.24
Range .5
Gain (coarse) 40 dB
Gain (fine) 6 dB
Reference Sensitivity 46 dB
Remarks: N/A

SEARCH UNIT

Serial No. K08505
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .30" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-66
"T" .280 Dia. 8.0
Temperature 76 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [N/A] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .10
Remarks 1" Screen Range N/A

VERTICAL LINEARITY

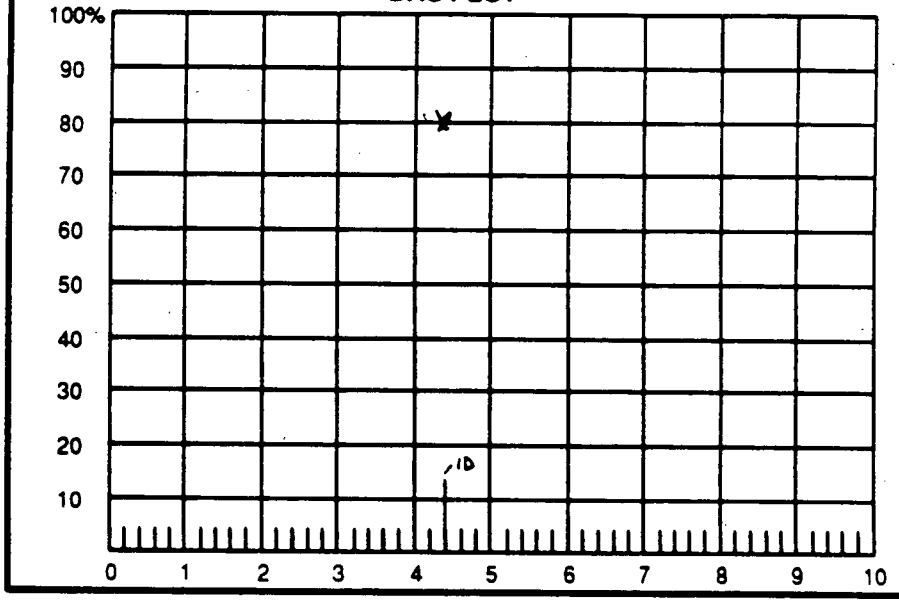
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

	TIME
INITIAL CAL.	1505
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1515

REMARKS: N/A

EXAMINERS	1	[signature]	LEVEL	III	DATE 10/6/93
	2	[signature]	LEVEL	II	DATE 10-6-93
REVIEWERS	1	[signature]	LEVEL	III	DATE 10-6-93
	2	[signature]	LEVEL	N/A	DATE 10/7/93
	3	[signature]	LEVEL	ANII	DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

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PAGE 5 OF 6
CPL-232 REV.0, Weld No. 17

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model KrautKramer USK-7
Serial No. 27276-3784
Sweep Length 9.80 Delay 7.41
Range .5
Gain (coarse) 20 dB
Gain (fine) 24 dB
Reference Sensitivity 44 dB
Remarks: N/A

SEARCH UNIT

Serial No. K08505
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 5'
Remarks: Exit Point .30" To Tip of Wedge
N/A

CALIBRATION BLOCK

No. CPL-66
"T" .280 Dia. 8.0
Temperature 76 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [N/A]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .25
Remarks 2.5 Screen Range
N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

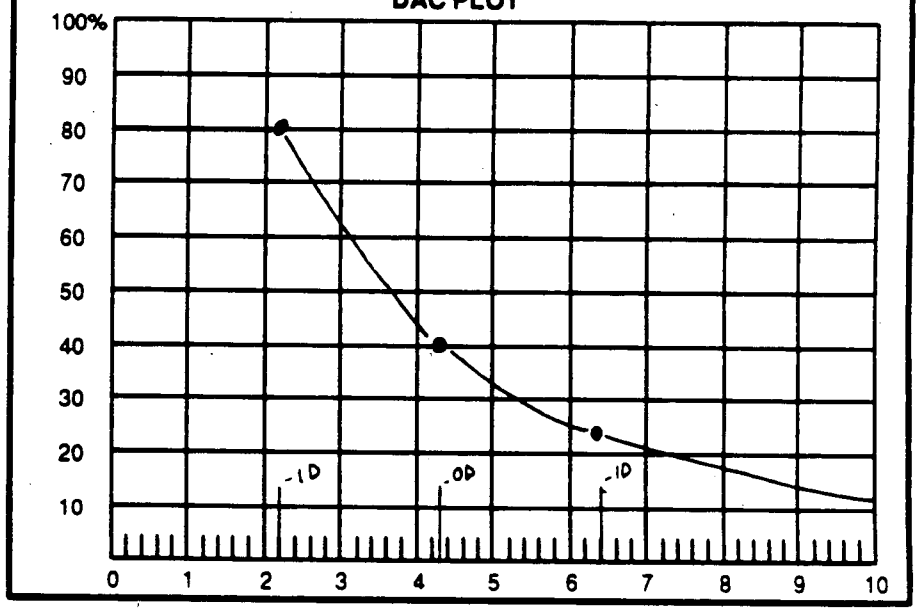
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1409
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1444

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/6/93
2 [signature] LEVEL II DATE 10-6-93

REVIEWERS 1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
3 [signature] LEVEL AN II DATE 10/7/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-017
PAGE 6 OF 6

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CS Pump B To Headers
ISO/DWG. NO. CPL-232 REV. 0
THERMOMETER S/N 962
COMPONENT TEMP. 81 °F

EXAM ITEM
CPL-232
Weld No. 17

SCAN 45° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Tee, Complete Both Sides

SCAN 60° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Tee, Complete Both Sides

SCAN 45° SCAN dB 56				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

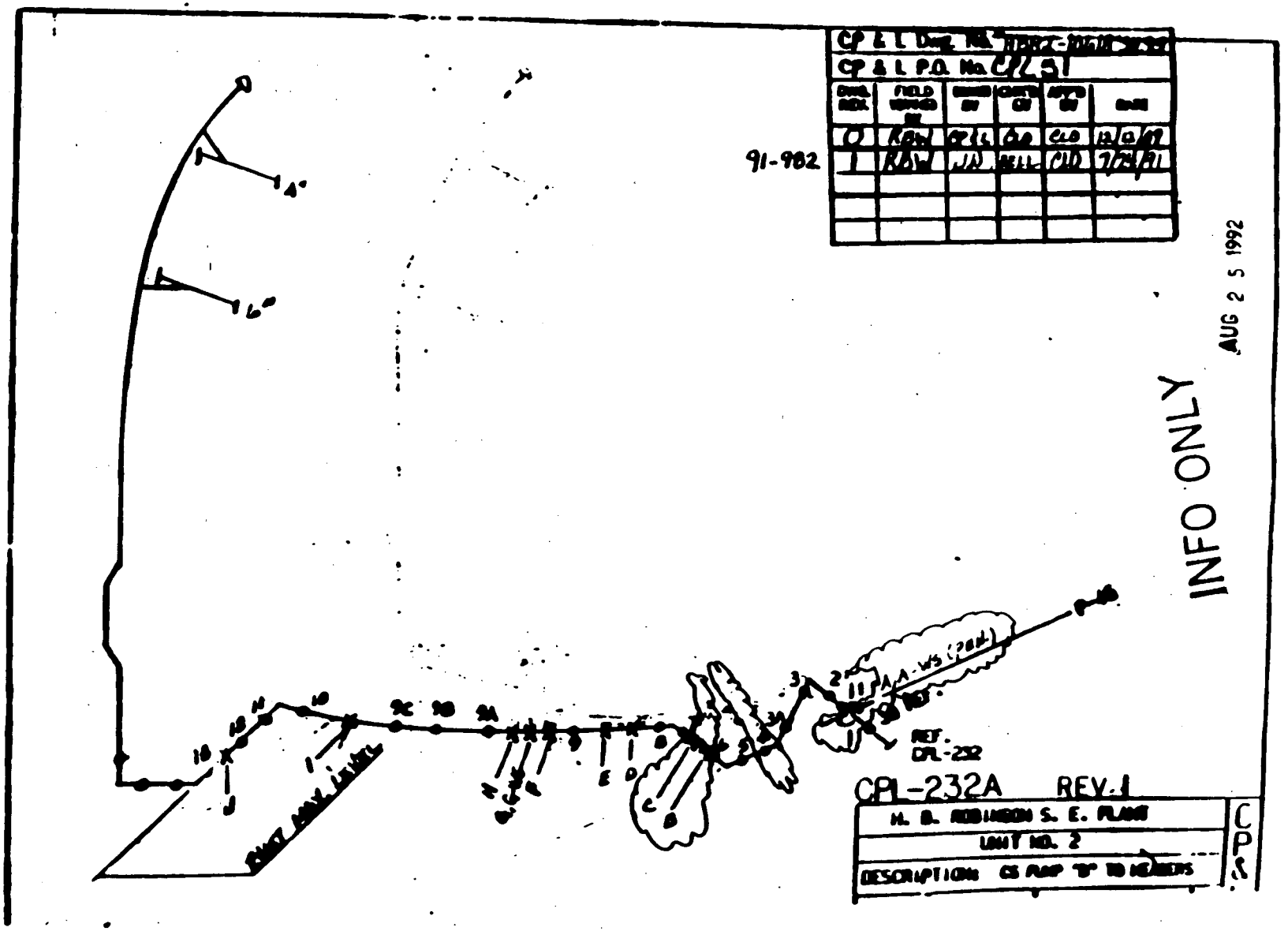
REMARKS: Pipe to Tee, Complete Both Sides
Note: Limited Pipe Side Due to Drain line, Code Required Coverage Achieved from Tee Side

SCAN 60° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: Pipe to Tee, Complete Both Sides
Note: Limited Pipe Side Due to Drain line, Code Required Coverage Achieved from Tee Side

EXAMINERS:
1 [signature] LEVEL III DATE 10/6/93
2 [signature] LEVEL II DATE 10-6-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-6-93
2 [signature] LEVEL N/A DATE 10/7/93
[signature] LEVEL ANII DATE 10/7/93


CP & L Dwg. No.
CP & L P.O. No.
91-982
INFO ONLY
AUG 2 5 1992
REF DPL-252
CPL-232A REV. 1
H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION
CP&L

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-091
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: SI	Component Name: SUPPORT	Component ID: A-WS
Drawing/Location: CPL-232A		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☐ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Richard R. Hamm Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANH RP Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-110
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 232A-B
Drawing/Location: CPL-232A R/1 / Rx Bldg. 228'-Floor Elev. Penetration Area Sleeve 96		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-11-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/12/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/13/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-106
Page 1 of 1

Project Job No. PSI☐ ISI☒

System:	Component Name: Support/Hanger	Component ID: 232A-C
Drawing/Location: CPL-232A R/1 / Rx Bldg 223' Elev. 3rd Support out of Sleeve 6		
☒ VT-3 Procedure: SP.1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications noted

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 5/7/93

AN II RP Valladares 10.14.93

DATA SHEET NO. 1217-044
THERMOMETER S/N MR92-04
TEMPERATURE 84 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED CS PUMP "B" TO HEADER ISO/DWG/SK. # CPL-232A REVISION 1
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "4"	NO INDICATIONS NOTED	X	N/A
WELD "P-45" (A-WS)	NO RECORDABLE INDICATIONS	X	
N/A	N/A	N/A	

EXAMINER Gerard A. Lavoie LEVEL II DATE 9-30-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Ramsey LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER AND R. Phillabaum DATE 10/5/93

DATA SHEET NO. 1223-030
PAGE 1 OF 5
CPL-232A REV.1, Weld No.4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 1.01 Delay 7.81
Range .5
Gain (coarse) 20 dB
Gain (fine) 18 dB
Reference Sensitivity 38 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28182
Size .25
Frequency 5.0 MHz
Mode Longitudinal
Nom. Angle 0 °
Measured Angle N/A °
Cable Type Potted to BNC
Cable Length 5'
Remarks: N/A

CALIBRATION BLOCK

No. Component
"T" .134 Dia. 6"
Temperature 74 ° F
Thermometer S/N 962

CALIBRATION

0° [X] Axial [N/A] Circ. [N/A]
Metal Path [N/A] Depth [X]
Each Major Screen Div. = .05
Remarks .5" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

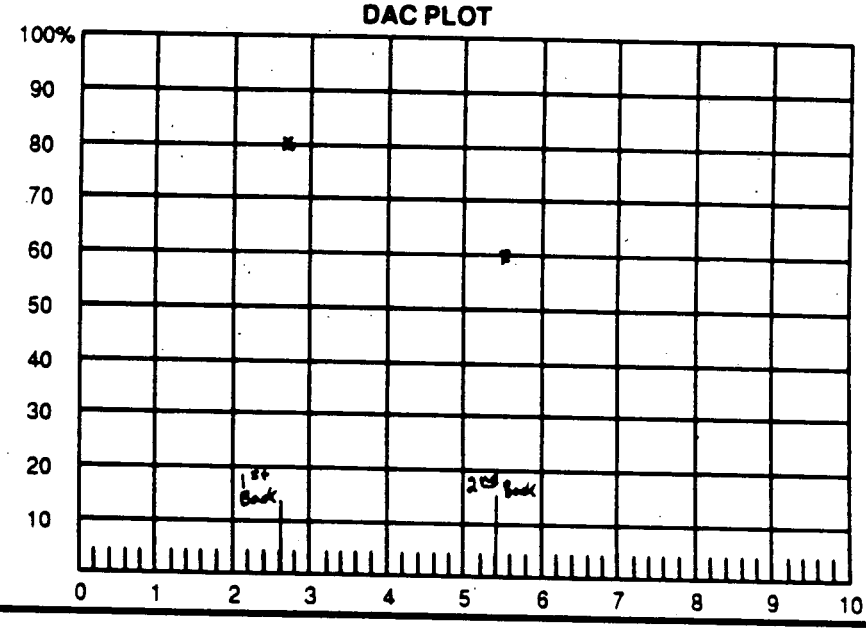
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	79

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1815
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1830

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10/8/93
2 [signature] LEVEL II DATE 10-8-93

REVIEWERS 1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL ADII DATE 10/12/93

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-030
PAGE 2 OF 5
CPL-232A REV. 1, Weld No. 4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 8.97 Delay 7.84
Range .5
Gain (coarse) 20 ⊥ / 20 = dB
Gain (fine) 20 ⊥ / 20 = dB
Reference Sensitivity 40 dB
Remarks: N/A

SEARCH UNIT

Serial No. K08505
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-65
"T" .134 Dia. 6"
Temperature 74 ° F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1
Remarks 1" Screen Range N/A

COUPLANT

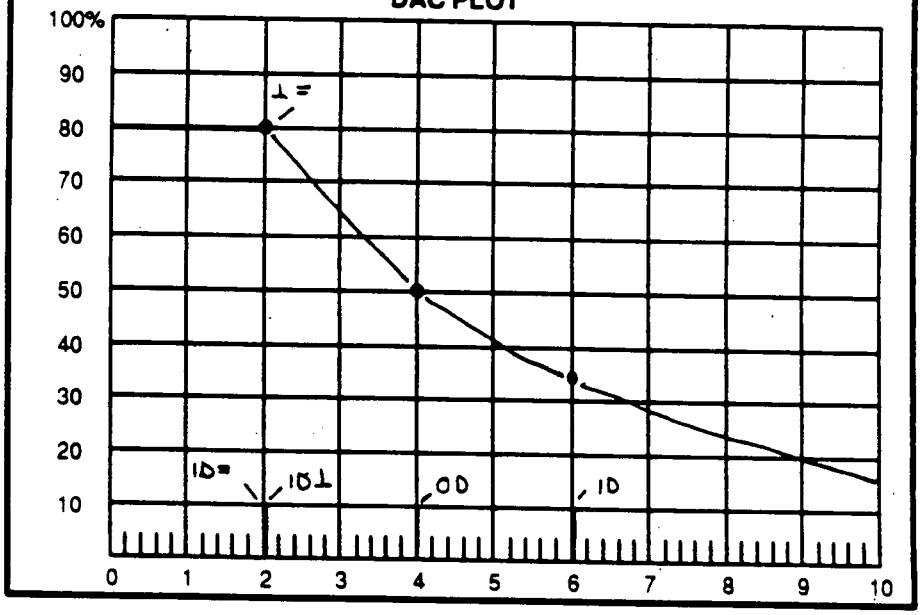
Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	79

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1752
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1810

REMARKS: N/A

EXAMINERS 1 _____ LEVEL III DATE 10/8/93
2 _____ LEVEL II DATE 10-8-93
REVIEWERS 1 _____ LEVEL III DATE 10-11-93
2 _____ LEVEL N/A DATE 10/11/93
3 _____ LEVEL AU II DATE 10/12/93

DATA SHEET NO. 1223-030
PAGE 3 OF 5
CPL-232A REV. 1, Weld No. 4

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP-1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model Krautkramer USK-7
Serial No. 27276-3702
Sweep Length 7.90 Delay 7.81
Range .5
Gain (coarse) 20 ⊥ / 20 = dB
Gain (fine) 24 ⊥ / 26 = dB
Reference Sensitivity 44 ⊥ / 46 = dB
Remarks: N/A

SEARCH UNIT

Serial No. F11506
Size .25
Frequency 5.0 MHz
Mode Shear
Nom. Angle 60 °
Measured Angle 60 °
Cable Type RG174/U
Cable Length 6'
Remarks: Exit Point .35" To Tip of Wedge N/A

CALIBRATION BLOCK

No. CPL-65
"T" .134 Dia. 6"
Temperature 74 °F
Thermometer S/N 962

CALIBRATION

0° [N/A] Axial [X] Circ. [X]
Metal Path [X] Depth [N/A]
Each Major Screen Div. = .1
Remarks 1" Screen Range N/A

COUPLANT

Brand ULTRAGEL II
Batch No. 093051

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	4

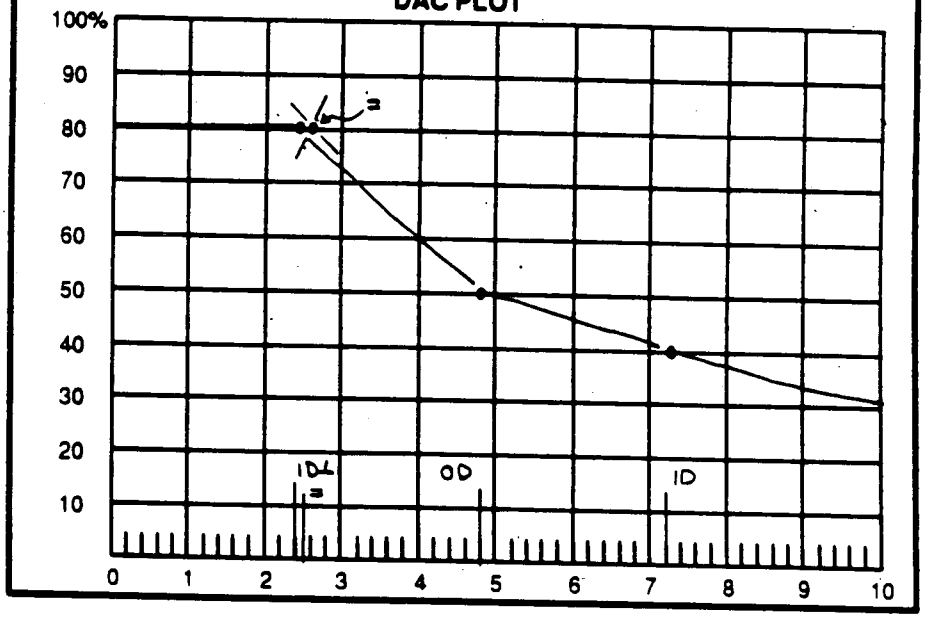
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	21
40	+6	79
20	+12	79

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	1707
INTERMEDIATE	N/A
INTERMEDIATE	N/A
INTERMEDIATE	N/A
FINAL CAL.	1742

DAC PLOT



REMARKS: N/A

EXAMINERS 1 _____ LEVEL III DATE 10/8/93
2 _____ LEVEL II DATE 10-8-93
REVIEWERS 1 _____ LEVEL III DATE 10-11-93
2 _____ LEVEL N/A DATE 10/11/93
3 _____ LEVEL ANII DATE 10/12/93

DATA SHEET NO. 1223-030
PAGE 4 OF 5

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CS Pump To Header
ISO/DWG. NO. CPL-232A REV. 1
THERMOMETER S/N 962
COMPONENT TEMP. 80 ° F

EXAM ITEM: Weld No. 4

SCAN 45 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 45 ° SCAN dB 46				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB 50				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

SCAN 60 ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	N/A	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: N/A

EXAMINERS:
1 [signature] LEVEL III DATE 10/8/93
2 [signature] LEVEL II DATE 10-8-93

REVIEWERS:
1 [signature] LEVEL III DATE 10-11-93
2 [signature] LEVEL N/A DATE 10/11/93
3 [signature] LEVEL AWI DATE 10/13/93

DATA SHEET NO. 1223-030
PAGE 5 OF 5
EXAM ITEM

Weld No. 4.

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM CS Pump To Header
ISO/DWG. NO. CPL-232A REV. 1
THERMOMETER S/N 962
COMPONENT TEMP. 80 °F

SCAN ° / SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N/A	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	N/A	N/A	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS:

N A

SCAN ° / SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ° / SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

N A

SCAN ° / SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

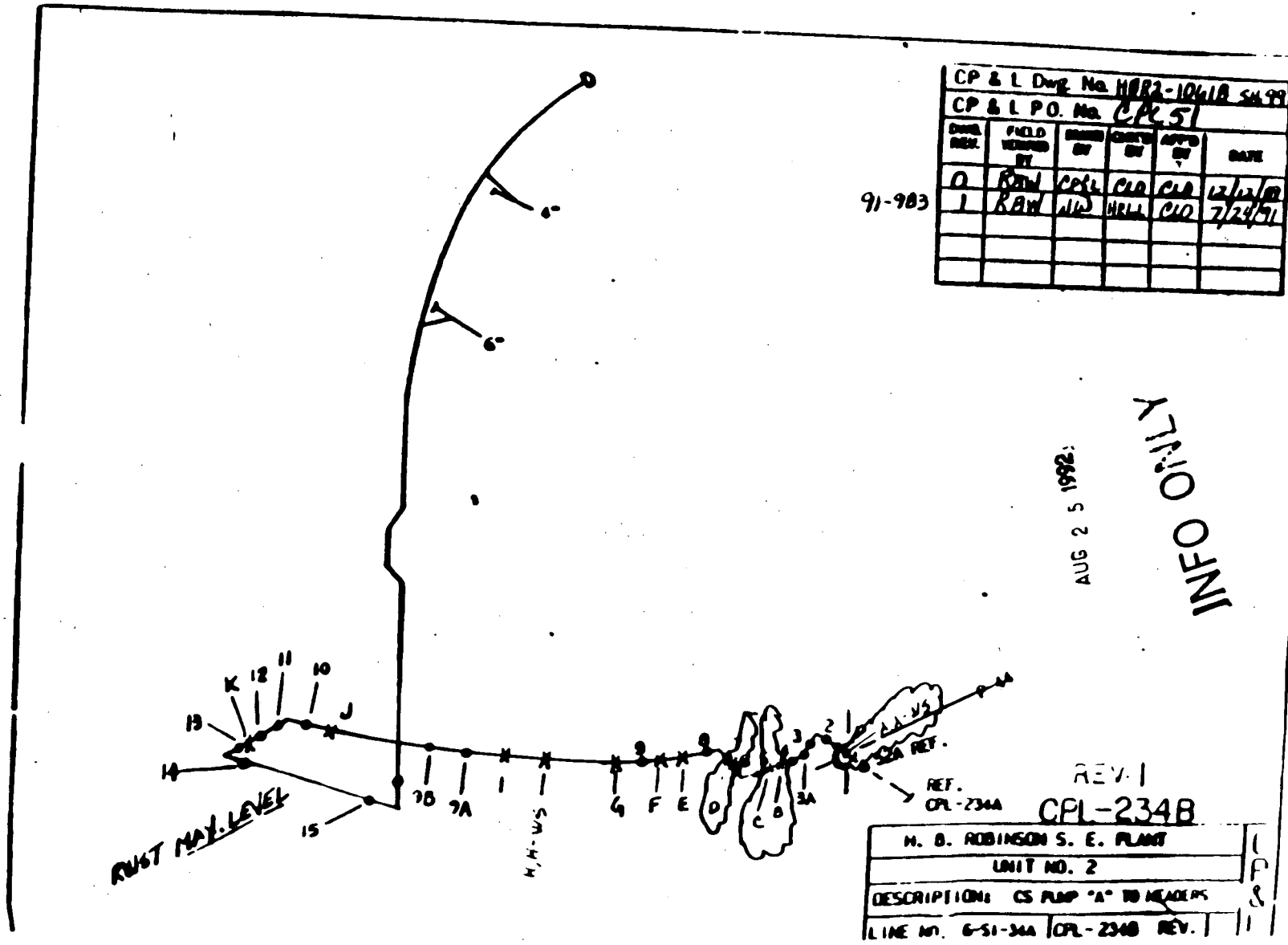
REMARKS:

N A

EXAMINERS:
1 LEVEL III DATE 10/8/93
2 LEVEL II DATE 10-8-93

REVIEWERS:
1 LEVEL III DATE 10-11-93
2 LEVEL N/A DATE 10/11/93
3 LEVEL ANII DATE 10/13/93

nes NUCLEAR ENERGY SERVICES, INC.


CP & L Dwg. No. HBR2-10418 Sh 99
CP & L P.O. No. CPL 5
DWG. REV.
FIELD VERIFIED BY
DRAWN BY
CHECKED BY
APPVD BY
DATE
0 Raw CPL CLO CLO 12/19/91
1 Raw JJS HRLL CLO 7/24/92
91-983
AUG 2 5 1992
INFO ONLY
6"
6"
K
12
11
10
J
13
14
15
RUST MAX. LEVEL
9B
9A
1
H, H-WS
4
F
E
D
C
B
3A
3
2
1
2A
REF.
REF. CPL-234A
REV. 1
CPL-234B
H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: CS PUMP "A" TO HEADERS
LINE NO. 6-SI-34A CPL-234B REV. 1
CP&L

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-080
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-234B		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Hare Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Wilson Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Palladores 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-042
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: SI	Component Name: SUPPORT	Component ID: A-WS
Drawing/Location: CPL-234B		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	
Mechanical interference		X	
Cracks		X	
Missing attachment/hardware		X	
Loose/missing parts		X	
Abnormal wear		X	
Abnormal corrosion		X	
Abnormal gouges		X	
Arc Strikes on sliding support		X	
Misalignment of the support		X	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Hamm Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-049
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: S.I.	Component Name: SUPPORT	Component ID: B
Drawing/Location: CPL-234B		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support	X	N/A	CLEARANCE IS "ZERO"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth L. Kane Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
✓ Pass
Fail

Accepted per Site Memo TSE-93-CN

ISI Reviewer: Richard B. Weber 10/28/93

CAROLINA POWER & LIGHT COMPANY ISI 11, Rev. 0, 07/93

ANII A. Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-050
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: S. I.	Component Name: SUPPORT	Component ID: C
Drawing/Location: CPL-234B		
☒ VT-3 Procedure: SP-1230 Rev. 0		~~N/A~~ VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote ~~N/A~~	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: ~~N/A~~ Hydraulic Snubber ~~N/A~~ Mechanical Snubber ☒ Support/Hanger ~~N/A~~ Constant Support ~~N/A~~ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ~~N/A~~ Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/7/93

QA NDE ISI II, [illegible]

ANII R Wallace 10/7/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-081
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: D
Drawing/Location: CPL-234B		
☒ VT-3 Procedure: SP-1230 Rev. 0		~~☐~~ N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote ~~☐~~ N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: ~~☐~~ N/A Hydraulic Snubber ~~☐~~ N/A Mechanical Snubber ☒ Support/Hanger ~~☐~~ N/A Constant Support ~~☐~~ N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO RECORDABLE INDICATIONS
Mechanical interference		X	" " "
Cracks		X	NO INDICATIONS NOTED
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ~~☐~~ N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Manes Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Theladakis 10/11/93

DATA SHEET NO. 1217-032
THERMOMETER S/N MR92-04
TEMPERATURE 82 ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL SS
CLASS 2

LIQUID PENETRANT EXAMINATION

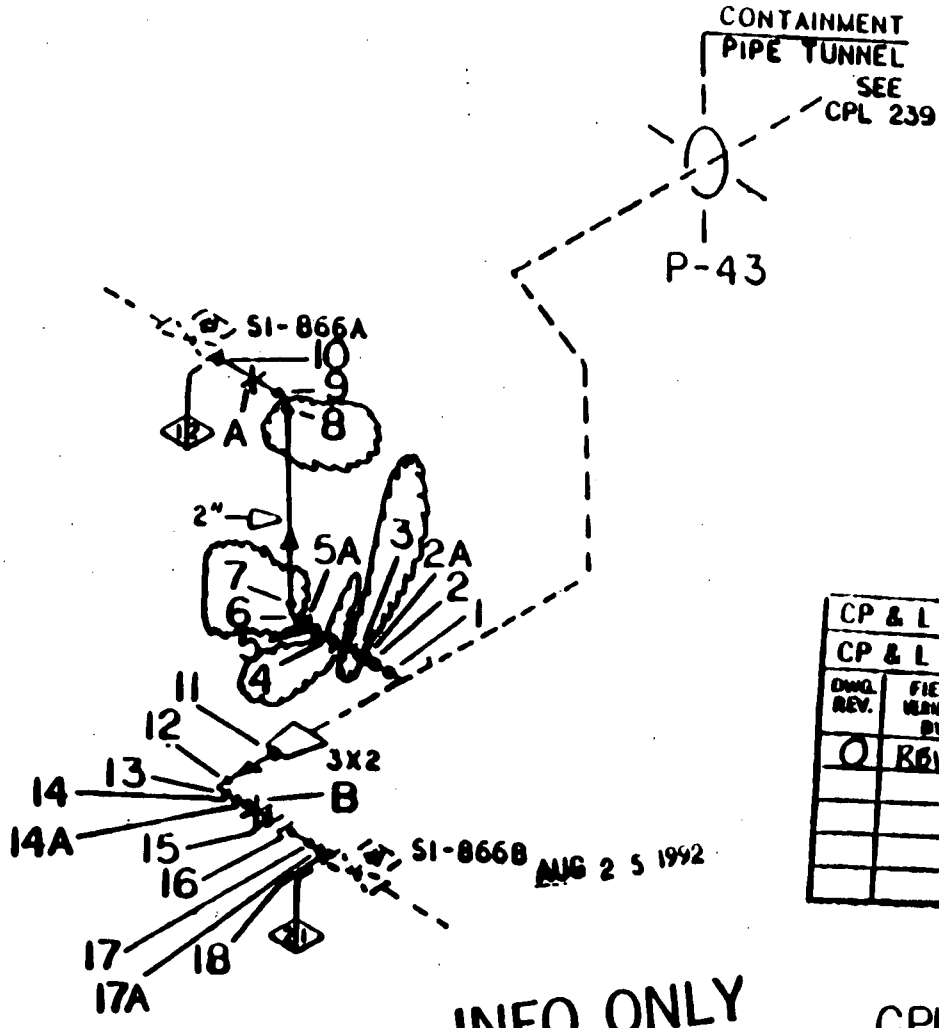
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED CS PUMP "A" TO HEADERS ISO/DWG/SK. # CPL-234B REVISION 1
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "P-44" (A-WS)	NO RECORDABLE INDICATIONS	X	N/A
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 9-30-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-1-93
REVIEWER [signature] DATE 10/2/93
REVIEWER [signature] DATE 10/5/93



CP & L Dwg. No. HBR2-10618 SH 109					
CP & L P.O. No. CPL51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPLL	PLO	PLO	12/12/89

AUG 2 5 1992

INFO ONLY

CPL-243 REV. 0

H.B. ROBINSON S.E. PLANT		CP&L
UNIT NO. 2		
Description		
Line No.	CPL 243 Rev. 0	

DATA SHEET NO. 1217-045
THERMOMETER S/N SL91-03
TEMPERATURE 76 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE _____ OF _____

SYSTEM EXAMINED S.I. ISO/DWG/SK. # CPL-243 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD #3	NO RECORDABLE INDICATIONS	X	N/A
WELD #4	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Chris D. Jodd/Ch D. Judd LEVEL II DATE 10-3-93
EXAMINER Benjamin Sanders LEVEL I DATE 10/3/93
REVIEWER Scott Lamb LEVEL III DATE 10-4-93
REVIEWER Richard D. Weber DATE 10/5/93
REVIEWER Anil Palladanda DATE 10/5/93

DATA SHEET NO. 1217-024
THERMOMETER S/N MR92-04
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 2

LIQUID PENETRANT EXAMINATION

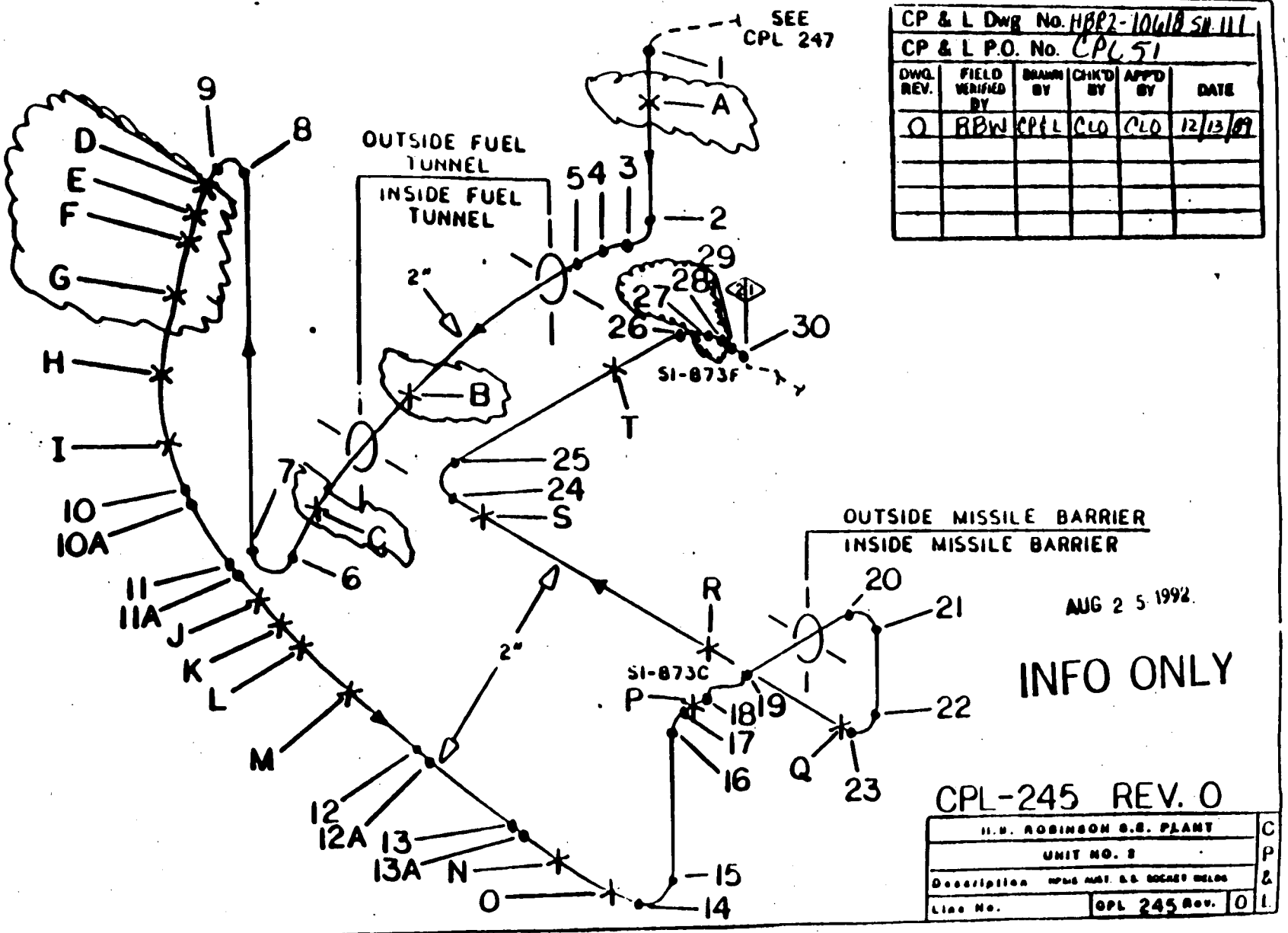
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED S.I. ISO/DWG/SK. # CPL-243 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "6"	NO INDICATIONS NOTED	X	N/A
" "7"	" " "	X	
" "8"	" " "	X	
N/A	N/A	N/A	

EXAMINER Kenneth A. Lane LEVEL II DATE 9/27/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lane LEVEL III DATE 9-27-93
REVIEWER Richard D. Weber DATE 9/27/93
REVIEWER ANII Rob Wallaclanso DATE 9/29/93



CP & L Dwg No. HBR2-10618 SH III					
CP & L P.O. No. CPL 51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPEL	CLD	CLD	12/13/89

AUG 2 5 1992

INFO ONLY

CPL-245 REV. 0

H.B. ROBINSON S.E. PLANT		CP&L
UNIT NO. 2		
Description		
Line No.	CPL 245 Rev. 0	

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 230-012
Page 1 of 1

Project Job No. PSI☐ ISI☒

System: SAFETY INJECTION	Component Name: SUPPORT/HANGER	Component ID: 245A
Drawing/Location: CPL-245/RX. BLDG. EXCESS LETDOWN HX. AREA		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-28-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

Reviewed: [signature] LII 9-29-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/2/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/5/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230 - 113
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: Safety Injection	Component Name: Support / Hanger	Component ID: 245-B
Drawing/Location: CPL-245 R/O / Rx Bldg. under Transfer Canal - Excess Letdown Area (West Side)		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	N/A	SEE BELOW
Mechanical interference			
Cracks			
Missing attachment/hardware			
Loose/missing parts			
Abnormal wear			
Abnormal corrosion			
Abnormal gouges			
Arc Strikes on sliding support			
Misalignment of the support			
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sim Level: II Date: 10-11-93

Examiner: N/A Level: N/A Date: N/A

Comments: INACCESSIBLE - DUE TO PHYSICAL OBSTRUCTIONS AND HIGH RADIATION LEVELS.

Reviewer: Scott Lam 10-13-93

(ISI Use Only)
☐ Pass
☐ Fail

ISI Reviewer: Richard B. Walker 10/13/93

QA VOL. S.T. [illegible] ITEMS
ANII R. Valladares 10-13-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-115
Page 1 of 1

Project HBR Job No. N/A PSI☐ ISI☒

System: SI	Component Name: Support	Component ID: 245-C1
Drawing/Location: CPL 245		
☒ VT-3 Procedure: NDEP 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.: N/A ☐ N/A	
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber N/A	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] (PETE TINGEN) Level: II Date: 10/14/93

Examiner: N/A Level: Date:

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/16/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R. Malladane 10/14/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-057
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: ~~S.I.S. Accumulator Cooling System~~ RCS Loop 3	Component Name: SUPPORT	Component ID: D
Drawing/Location: CPL-245		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A

Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD

Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts	X	N/A	U-BOLT NUTS LOOSE
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth R. Hance Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-043
Page 1 of 1
PSI☐ ISI☒

Project HBR-2 Job No.

System: ~~AUX. COOLING SYS.~~ S.I.S. (10-5-93 KRM)	Component Name: SUPPORT	Component ID: E
Drawing/Location: CPL-245		
☒ VT-3 Procedure: SP-1230 Rev. O	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Constant Support	N/A Mechanical Snubber N/A Variable Support ☒ Support/Hanger

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Yarne Level: II Date: 10-4-93

Examiner: N/A Level: N/A Date: N/A

Comments:

Reviewed: Scott Lawn LIII 10-5-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/5/93

QA NDE ISI 11, Rev. 0, 07/93

AN II RP Valladares 10/7/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-079
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: F
Drawing/Location: CPL-245		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Mance Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-041
Page 1 of 1

Project HBR-2 Job No.

PSI ☐ ISI ☒

System: ~~Aux Coolins Sys.~~ S.I.S. RCN 10-8-93	Component Name: SUPPORT	Component ID: G
Drawing/Location: CPL-245		
☒ VT-3 Procedure: SP-1230 Rev. 0	~~☒~~ N/A VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ~~☒~~ N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: ~~☒~~ N/A Hydraulic Snubber ~~☒~~ N/A Constant Support ~~☒~~ N/A Mechanical Snubber ~~☒~~ N/A Variable Support	☒ Support/Hanger

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	"
Cracks		X	"
Missing attachment/hardware		X	"
Loose/missing parts		X	"
Abnormal wear		X	"
Abnormal corrosion		X	"
Abnormal gouges		X	"
Arc Strikes on sliding support		X	"
Misalignment of the support		X	"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ~~☒~~ N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Lane Level: II Date: 10-4-93

Examiner: N/A Level: N/A Date: N/A

Comments:

Reviewed: Scott Lane 10-5-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/5/93

CATALOG IS: Rev. 0, ...

AN II R Chilcutt 10/7/93

SL 10-3-93

DATA SHEET NO. 1217-046
THERMOMETER S/N 962
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S.S.
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP 1217-046
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

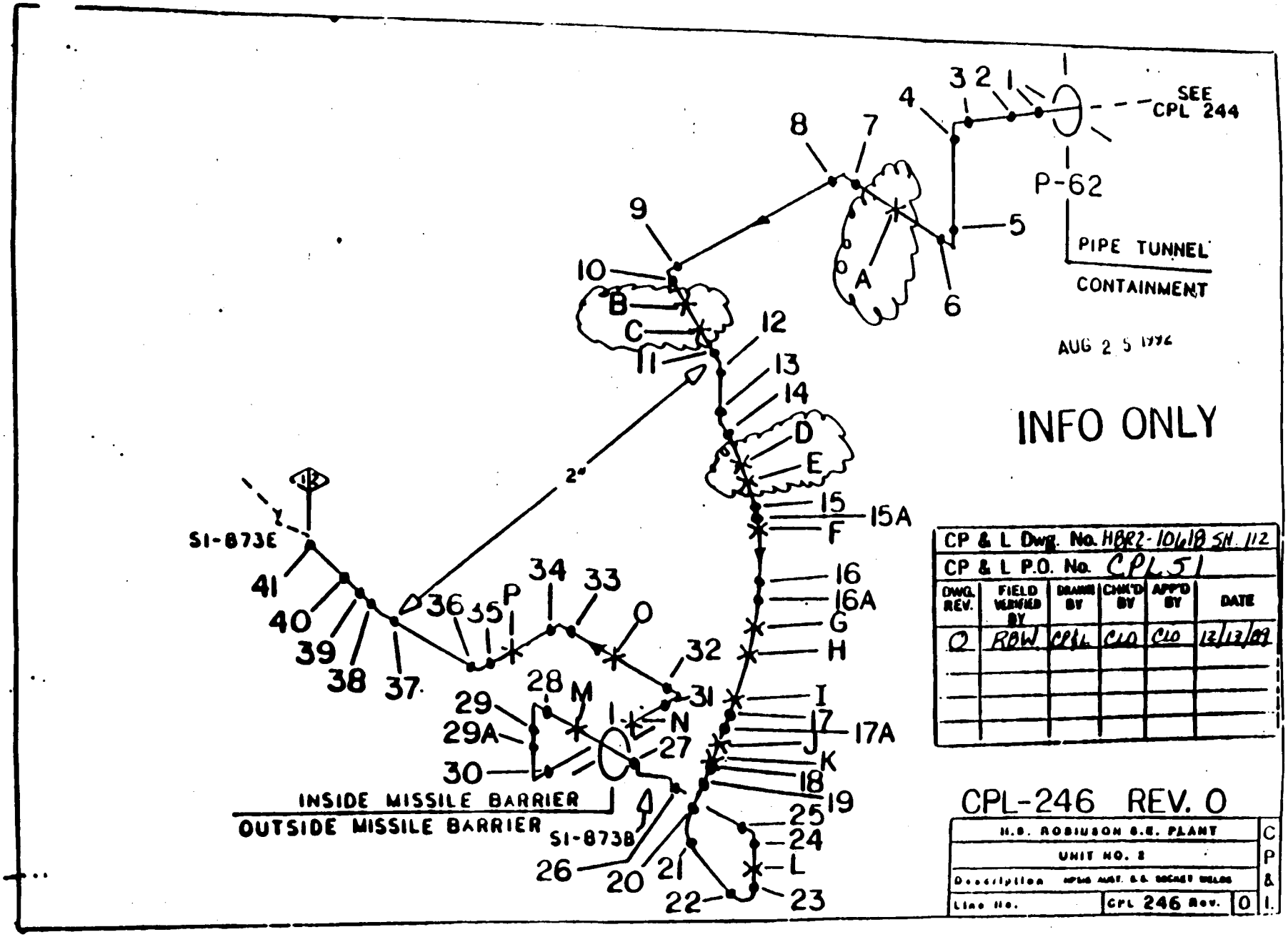
SYSTEM EXAMINED S1 ISO/DWG/SK. # 245 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT		SKL-SP	93E01K	15 MINUTES
REMOVER		SKC-NF	92D02P	5 MINUTES
DEVELOPER	↓	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
27	No recordable indications	X	N/A
28	No recordable indications	X	N/A
	N/A		
	N/A		

EXAMINER Scott Larson LEVEL III DATE 10-3-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10/4/93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER ANII R. Valladares DATE 10/5/93

NUCLEAR ENERGY SERVICES, INC.


SEE CPL 244
P-62
PIPE TUNNEL
CONTAINMENT
AUG 2 5 1992
INFO ONLY
SI-873E
SI-873B
INSIDE MISSILE BARRIER
OUTSIDE MISSILE BARRIER
CP & L Dwg. No. HBR2-10118 SH. 112
CP & L P.O. No. CPL 51
DWG. REV. | FIELD VERIFIED BY | DRAWN BY | CHK'D BY | APP'D BY | DATE
0 | RAW | CPL | CLO | CLO | 12/12/09
CPL-246 REV. 0
H.B. ROBINSON S.E. PLANT
UNIT NO. 2
Description
Line No. CPL 246 Rev. 0
C P & I.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-065
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: SI	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-246-A		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support FIG. 247	Actual: 1/8"		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth R. Hance Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: HOT/COLD SETTING NOT SPECIFIED ON SPRING CAN.

(ISI Use Only)
☑ Pass Accepted per Site Memo TSE-93-EE-
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

ANII A Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-082
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: B
Drawing/Location: CPL-246-B		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Constant Support	N/A Mechanical Snubber N/A Variable Support ☒ Support/Hanger

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth R. Mance Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R. Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-064A
Page 1 of 1

Project HBR Job No. PSI☐ ISI☒

System: HPSIS	Component Name: Support	Component ID: 246 C
Drawing/Location: CPL 246 Rev 0 / Containment 1st Level		
☒ VT-3 Procedure: NDEP 6.16 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 3/8"		
Snubber	Actual:	Stroke:	S/N

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/18/93

Examiner: N/A Level: Date:

Comments:

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-016
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SAFETY INJECTION	Component Name: Support/Hanger	Component ID: 246D
Drawing/Location: CPL-246D / RX. Bldg. OUTSIDE CRANE WALL		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

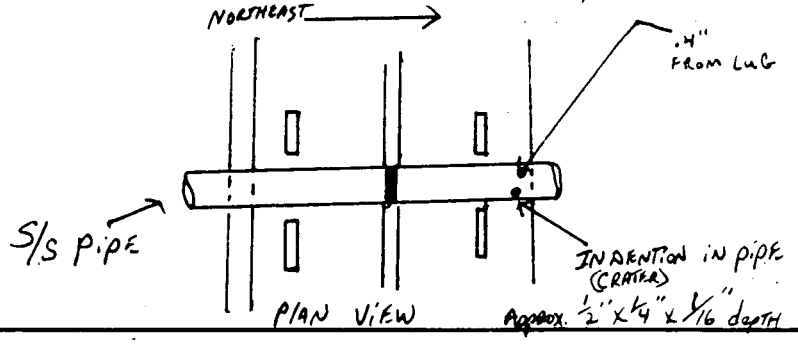
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-28-93

Examiner: N/A Level: N/A Date: N/A

Comments:
No. Component ID on Support



Reviewed: [signature] LIII 9-30-93

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/2/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10-5-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-C40
Page 1 of 1
PSI☐ ISI☒

Project HBR-2 Job No.

System: ~~AUX COOLING SYS~~ S.I.S. Component Name: SUPPORT KRN 10-5-93	Component ID: E
Drawing/Location: CPL-246	
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A ☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	"
Cracks		X	"
Missing attachment/hardware		X	"
Loose/missing parts			UNABLE TO VERIFY LOOSE OR TIGHT FIT DUE TO INSULATION *
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion		X	"
Abnormal gouges		X	"
Arc Strikes on sliding support		X	"
Misalignment of the support		X	"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Hare Level: II Date: 10-4-93

Examiner: N/A Level: N/A Date: N/A

Comments:
* U-BOLT ASSEMBLY ENCLOSED BY INSULATION

Reviewed: Scott Lamm LTH 10-5-93

(ISI Use Only)
ISS

See 10/5/93 Data Sheet for Re-Insp.

IS Reviewer: Richard B. Weber 10/5/93

ANII RP Valladares 10-7-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 230-040
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: ~~AUX COOLING SYS.~~ S.I.S. KEN	10-5-93 Component Name: SUPPORT	Component ID: E
Drawing/Location: CPL-246		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") N/A Reject (When any answer above is "yes")

Examiner: Kenneth L. Hance Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

Reviewed: Scott Lam III 10-5-93

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Wehe 10/7/93

CANDESCENT, INC. [illegible]

ANII R.P. Valladares 10-7-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-119
Page 1 of 2

Project NBR Job No. PSI ☐ ISI ☒

System: HPSIS	Component Name: Support	Component ID: 246 "G
Drawing/Location: CPL 246 Rev 0 / Containment 1st Level		
☒ VT-3 Procedure: NDEP 616 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hange ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 5/8"		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] PETERSEN Level: II Date: 10/21/93

Examiner: N/A Level: N/A Date: N/A

Comments: Support was originally inspected as CPL 246 "C". During the walkdown with the maintenance personnel to correct the adverse conditions, it was noted that 246 "G" was actually inspected. This report documents the inspection of CPL 246 "G". Report # 1230-046A documents the inspection on 246 "C".

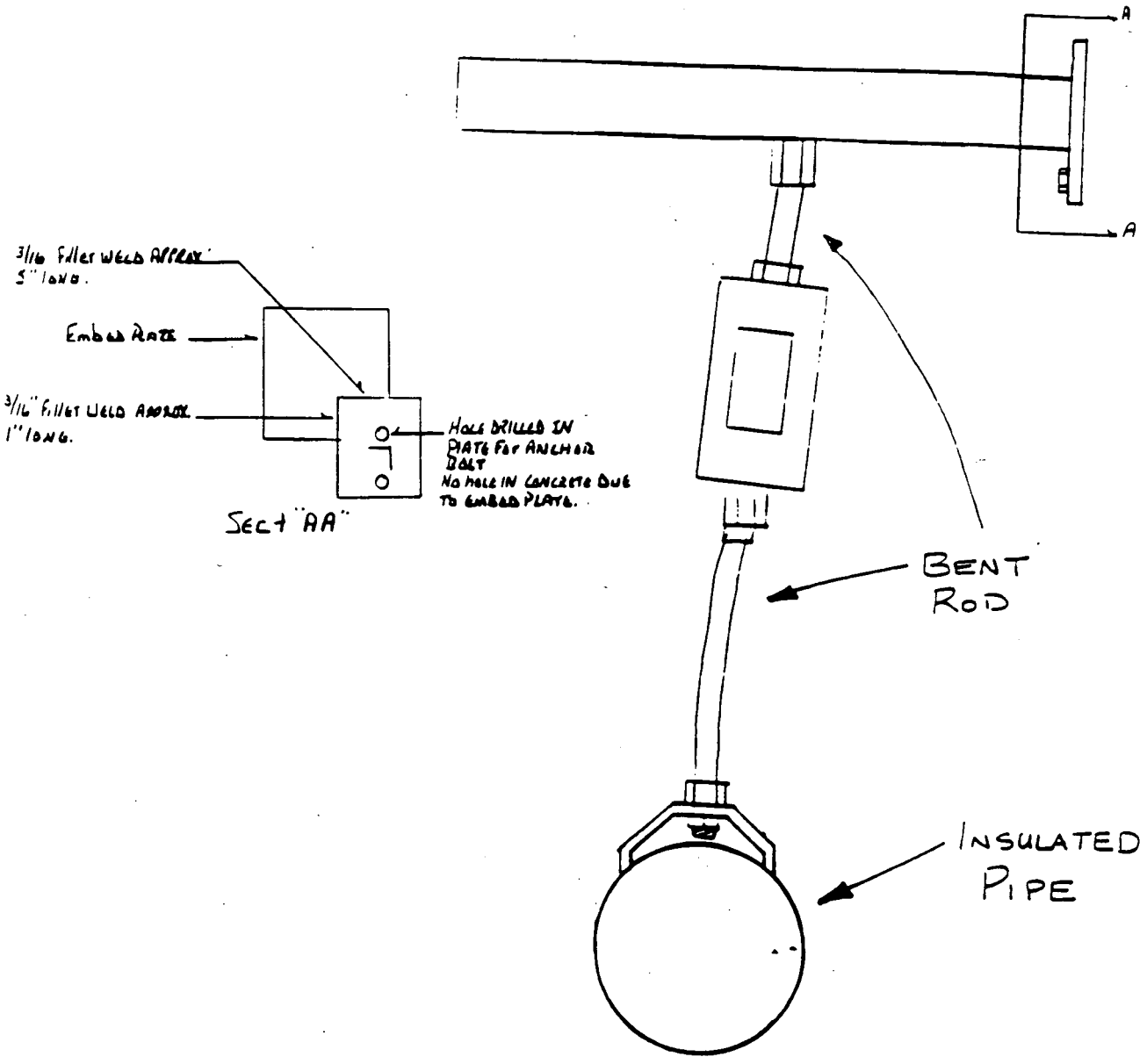
Reviewed [signature] 10-21-93 LIII

(ISI Use Only)
☐ Pass
☑ Fail

Note: Acceptable as is per Site Memo TSE-93-EN

ISI Reviewer: [signature] Date: 10/28/93

ANII [signature] 10/28/93



CPL-246, Rev 0

Support "G"

10/21/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-064
Page 1 of 2

Project HBR2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: C
Drawing/Location: CPL-246		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	X	N/A	SEE ATTACHED DRAWING
Mechanical interference	N/A	X	NO INDICATIONS NOTED
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	ANCHOR BOLT MISSING
Loose/missing parts	X	N/A	NUTS LOOSE
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion	N/A	X	" " "
Abnormal gouges	N/A	X	" " "
Arc Strikes on sliding support	N/A	X	" " "
Misalignment of the support	N/A	X	" " "
Variable/Constant Support FIG. 247	Actual: 7/8" SETTING		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

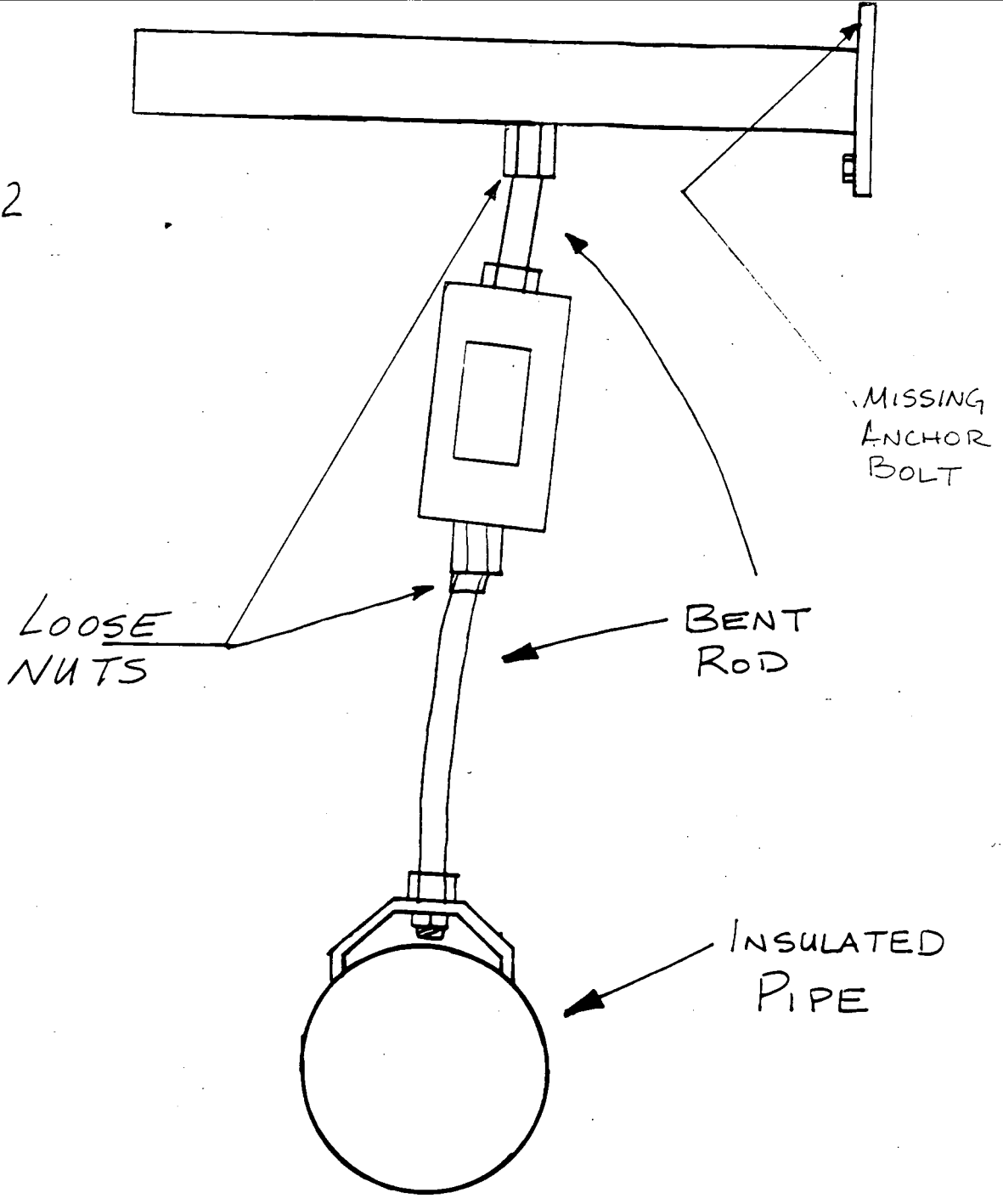
Examiner: Kenneth A. Hare Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

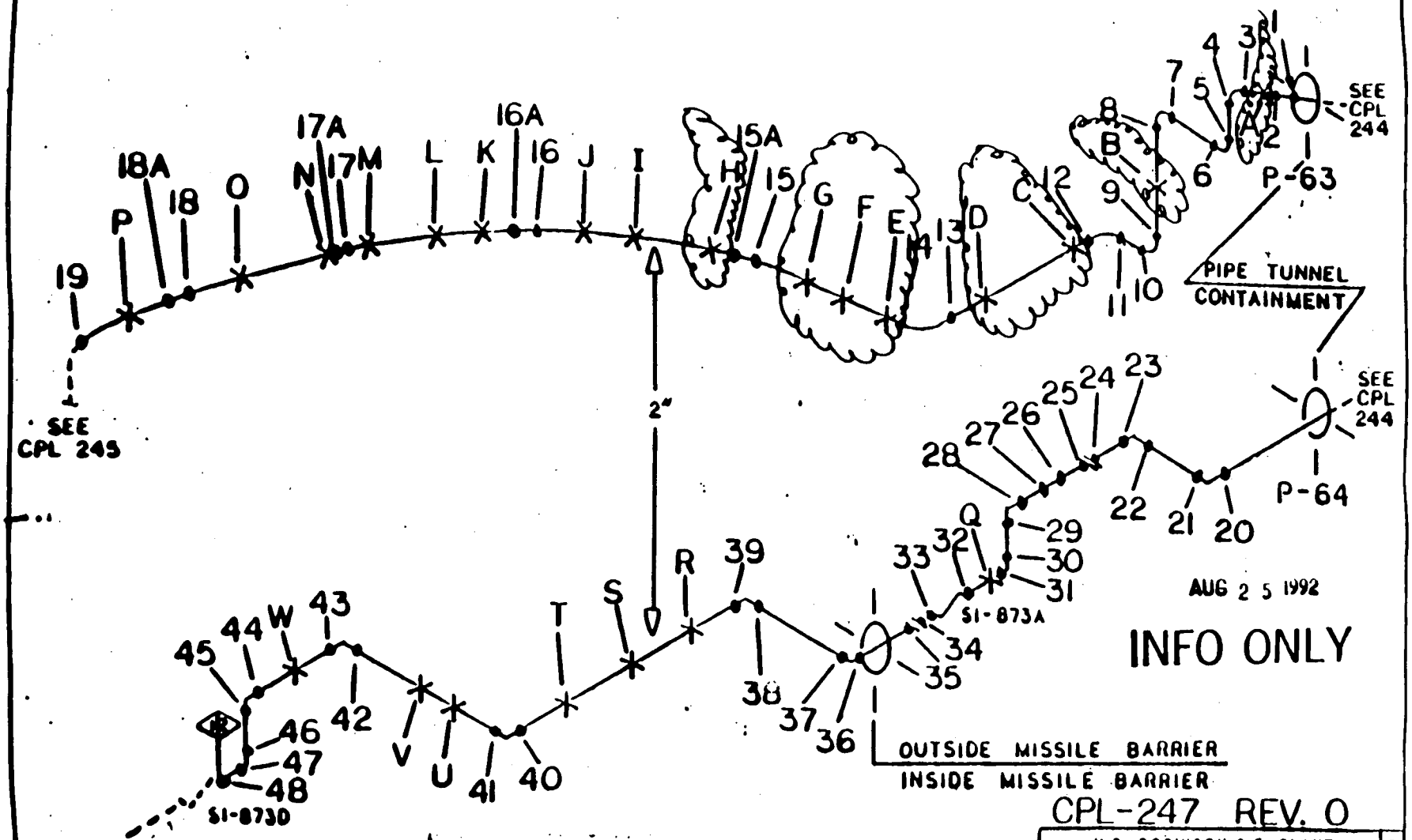
ISI Reviewer: Richard B Weber Date: 10/27/93



CPL-246, REV 0

SUPPORT C

Kenneth L. Hance LEVEL II 10-7-93



AUG 2 5 1992

INFO ONLY

CPL-247 REV. 0

H.B. ROBINSON S.E. PLANT	C P & L
UNIT NO. 2	
Description	
Line No.	CPL 247 Rev. 0

CP & L Dwg. No. HBR2-10148 Sh. 113					
CP & L P.O. No. CPL 5					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
2	RBW	CHL	CLO	CLO	12/18/09

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-101
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 247-A
Drawing/Location: CPL-247R/0/Rx. Bldg. Floor - 228'		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Lee Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:

NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Palladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-004
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Safety Injection	Component Name: Support/Hanger	Component ID: 247B
Drawing/Location: CPL-247 R/O / Reactor Bldg. outside crane wall, NE quadrant - ~~33'~~ 39'-2 1/2" Elev. 240'		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-24-93

Examiner: N/A Level: N/A Date: N/A

Comments: No indications noted (Identification is not marked on component)

Reviewed: [signature] LIII 9-25-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R.P. Valladares 9-29-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-056
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 247C
Drawing/Location: CPL-247 R/C / Rx. Bldg. 228' E/W. Near Pentration Area		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

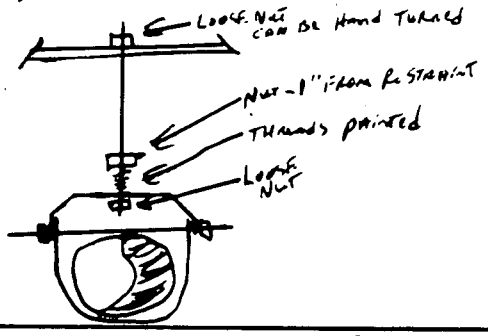
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:



COMPONENT NOT TAGGED (I.D.)

(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-055
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: VARIABLE Support	Component ID: 247-D
Drawing/Location: CPL-247 R/O / Rx. Bldg. 228'-Floor Elev.		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓	✓	SS 10-6-93
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 5/8" From window edge (No marker on can)		
Snubber	Actual:	Stroke:	S/N

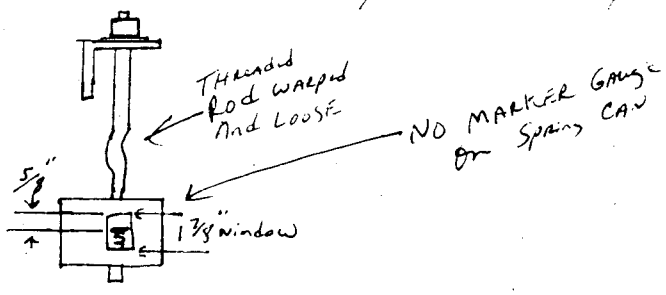
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:

IDENTIFICATION NOT MARKED ON COMPONENT



(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-005
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Reactor Coolant	Component Name: Support / Hanger	Component ID: 247E
Drawing/Location: CPL-247 R/C / Reactor Bldg. Outside Crane Wall, N. Quadrant Elev. 236		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-24-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED (Identification NOT marked on Component)

Reviewed: [signature] LIII 9-25-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/27/93

QA NDE ISI 11, Rev. 0, 07/93

NII [signature] 9-29-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-086
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: C Hem. & Volume control	Component Name: Support / Hanger	Component ID: 247-F
Drawing/Location: CPL-247 R/0 / 228' floor elevation Rx. Bldg.		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Singer Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-003
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SAFETY INJECTION	Component Name: SUPPORT/HANGER	Component ID: 247 G
Drawing/Location: CPL-247 R/O / REACTOR BLDG, OUTSIDE CRANE WALL, N.W. QUADRANT, ELEV. 236'		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-24-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED (IDENTIFICATION NOT MARKED ON COMPONENT)

Reviewed: Scott Lawson 9.25-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 9/27/93

QA NDE ISI 11, Rev. 0, 07/93

AN II [signature] 9/29/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-042
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: Aux Cooling Sys.	Component Name: Support	Component ID: H
Drawing/Location: CPL-247		
☒ VT-3 Procedure: SP-1230 Rev. 0		☒ VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote ☒ N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☒ Other Neutral Gray Card	Type of Component Support: ☒ N/A Hydraulic Snubber ☒ N/A Mechanical Snubber ☒ Support/Hanger ☒ N/A Constant Support ☒ N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	No indications noted
Mechanical interference		X	"
Cracks		X	"
Missing attachment/hardware		X	"
Loose/missing parts		X	"
Abnormal wear		X	"
Abnormal corrosion		X	"
Abnormal gouges		X	"
Arc Strikes on sliding support		X	"
Misalignment of the support		X	"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☒ N/A Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 10-4-93

Examiner: N/A Level: N/A Date: N/A

Comments:

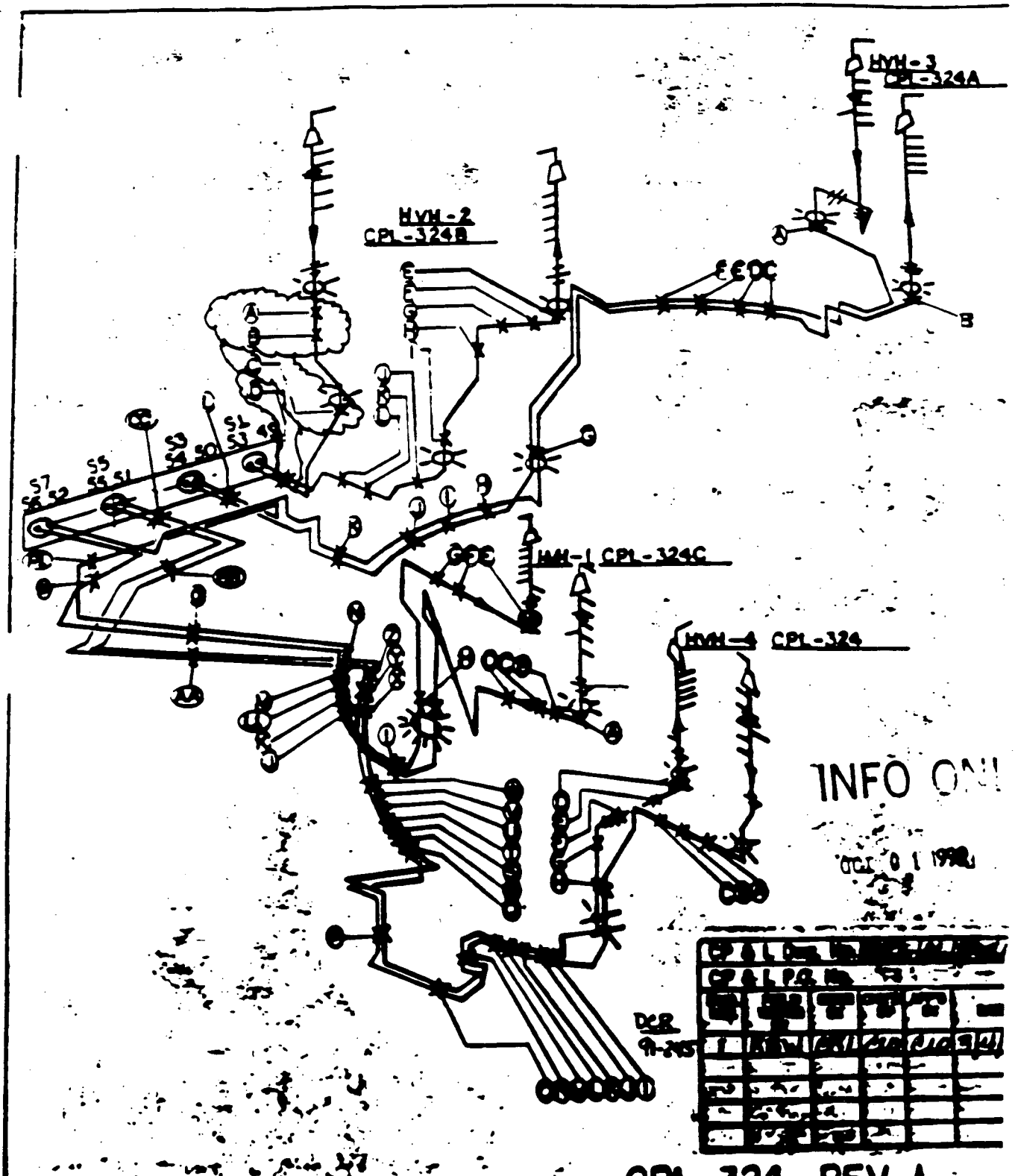
Reviewed: D. Scott Lamm Lead 10-5-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewed: Richard B. Weber 10/5/93

Rev. 0, 07/93

ANII A Walladares 10-5-93


HVH-3
CPL-324A
HVH-2
CPL-324B
HVH-1 CPL-324C
HVH-4 CPL-324
INFO ONL
OCT 0 1 1990
DCR
91-245
KEY
CPL-324C HVH-1 A THRU EE
CPL-324B HVH-2 A THRU L
CPL-324A HVH-3 A THRU L
CPL-324 HVH-4 A THRU GG
CPL-324 REV. 1
H.B. ROBINSON S.E. PLANT
UNIT NO. 2
Description SERVICE WATER (MOD. 85
CPL-324 Rev

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-021
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SERVICE WATER	Component Name: SUPPORT/HANGER	Component ID: 324-A
Drawing/Location: CPL-3270 R/1 / RX. Bldg. Elev 271' Above HVH-5B FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

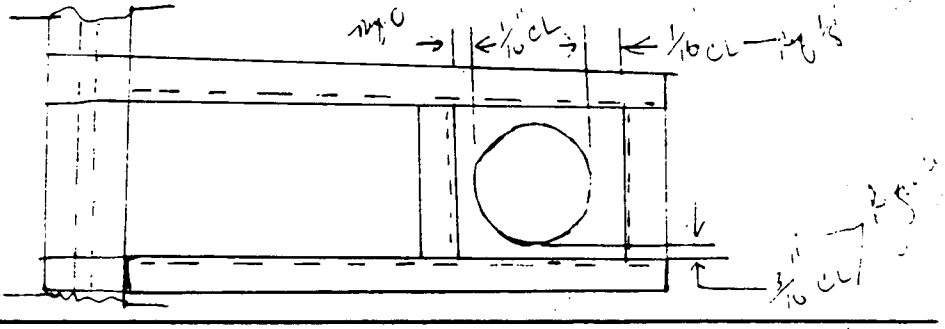
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	SLIGHT RUST ON ANGLES IRON
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Required [signature] 10-2-93

(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-CF

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AN11 RP Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-104
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CW	Component Name: Support/Hanger	Component ID: 324-B
Drawing/Location: CPL-324/Rx. Bldg. 251'-8" Floor Plan		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments: No indications noted (other than slight rust on clamp)

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Wilson Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230 020
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SERVICE WATER	Component Name: SUPPORT/HANGER	Component ID: 324-C
Drawing/Location: CBE-32[illegible] E/I / Pr Bldg. Elev. 249.5		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

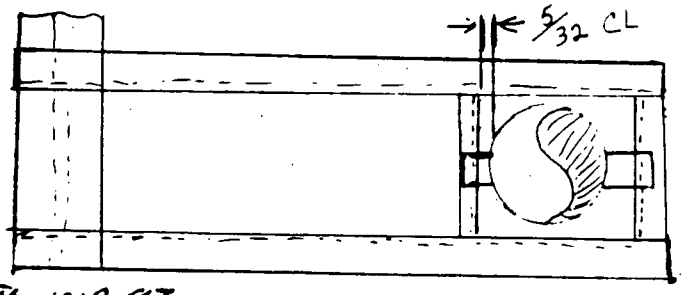
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		Requires A O CL Site Stated Below
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Reviewer: [signature] 10-2-93

(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-CE

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-061
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Service Water	Component Name: Support/Hanger	Component ID: 324-D
Drawing/Location: CPL-324-R/1 / Rx Bldg. 228' Elev. Penetration 45 - Sleeve 6		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

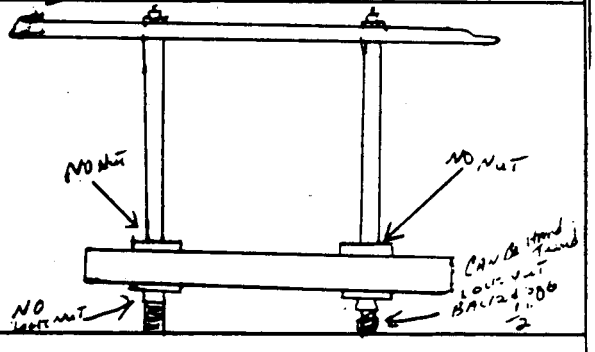
Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: 10-7-93 II N/A Date: N/A

Comments: NO IDENTIFICATION ON COMPONENT

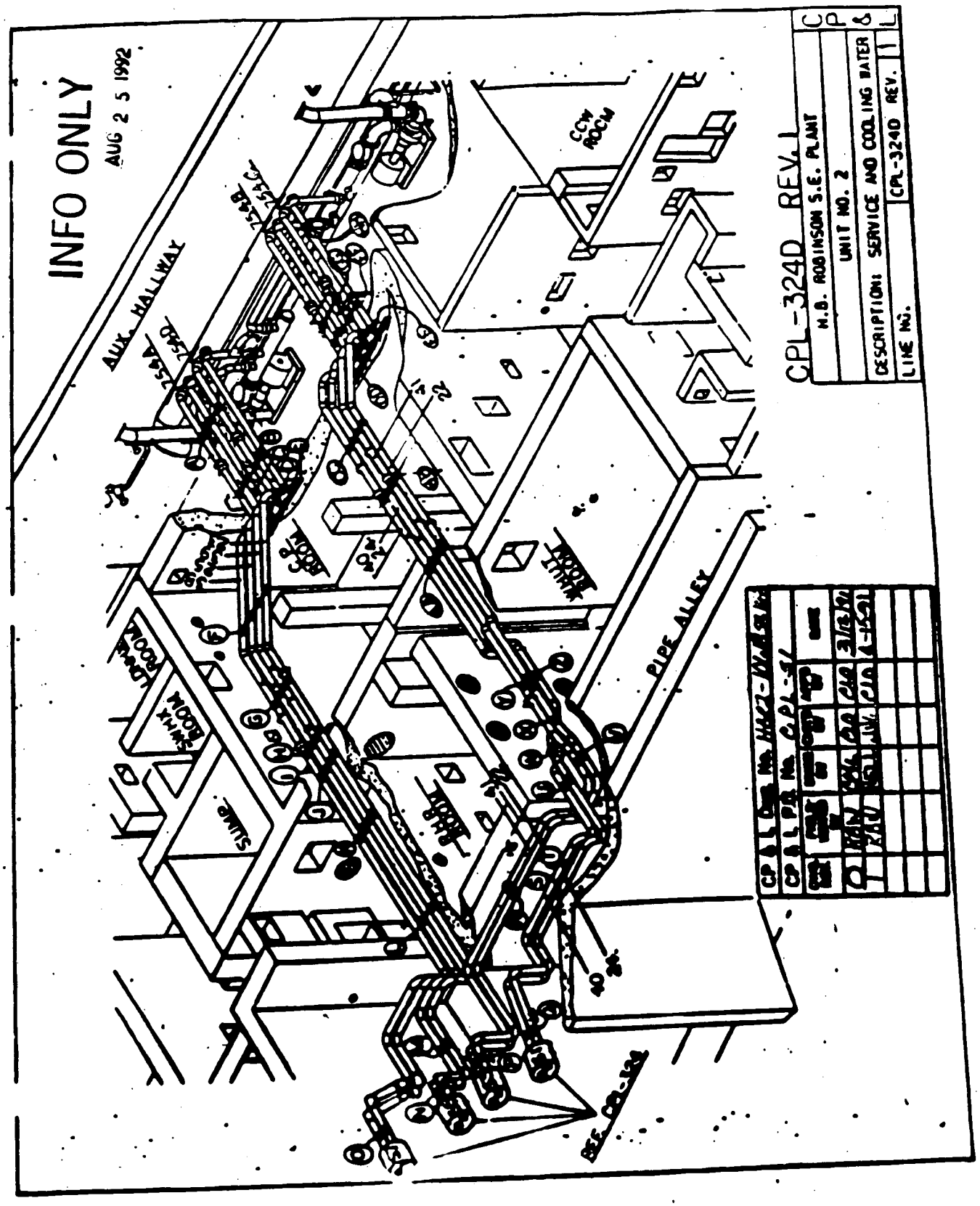
THIS MOD. is Being WORKED

VERY LOOSE SUPPORT



(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93



16Y

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-059
Page 1 of 1

Project Job No. PSI ☐ ISI ☒

System: SERVICE WATER	Component Name: SUPPORT/HANGER	Component ID: 324 D-Q
Drawing/Location: CPL-324 D R/O / AUX BLDG. FROM SLEEVE ON E		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	* See Below
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:
* U-Bolt were dissassembled could not verify Clearance - This penetration is involved in a modification.

(ISI Use Only)
☑ Pass
☐ Fail
Accepted per Site Memo TSE-93-CR

ISI Reviewer: [signature] Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AN II [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-085
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SERVICE WATER	Component Name: Support / Hanger	Component ID: 324D-S
Drawing/Location: CPL-324D-S / Aux Bldg. Pipe Alley, off of Sleeve one		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Singleton Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B Walker Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-053
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Service WATER	Component Name: Support / Hanger	Component ID: 324D-T
Drawing/Location: CPL-324D-R/O / Aux. Bldg. - Piet. Alley		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments: NO INDICATIONS NOTED

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/11/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/11/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230--112
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Service Water	Component Name: Restraint	Component ID: CPL-324D U
Drawing/Location: CPL-324D Rev. 0		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure:	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	✓	
Mechanical interference	N/A	✓	
Cracks	N/A	✓	
Missing attachment/hardware	N/A	✓	
Loose/missing parts	N/A	✓	
Abnormal wear	N/A	✓	
Abnormal corrosion	N/A	✓	
Abnormal gouges	N/A	✓	
Arc Strikes on sliding support	N/A	✓	
Misalignment of the support	N/A	✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/11/93

Examiner: N/A Level: N/A Date: N/A

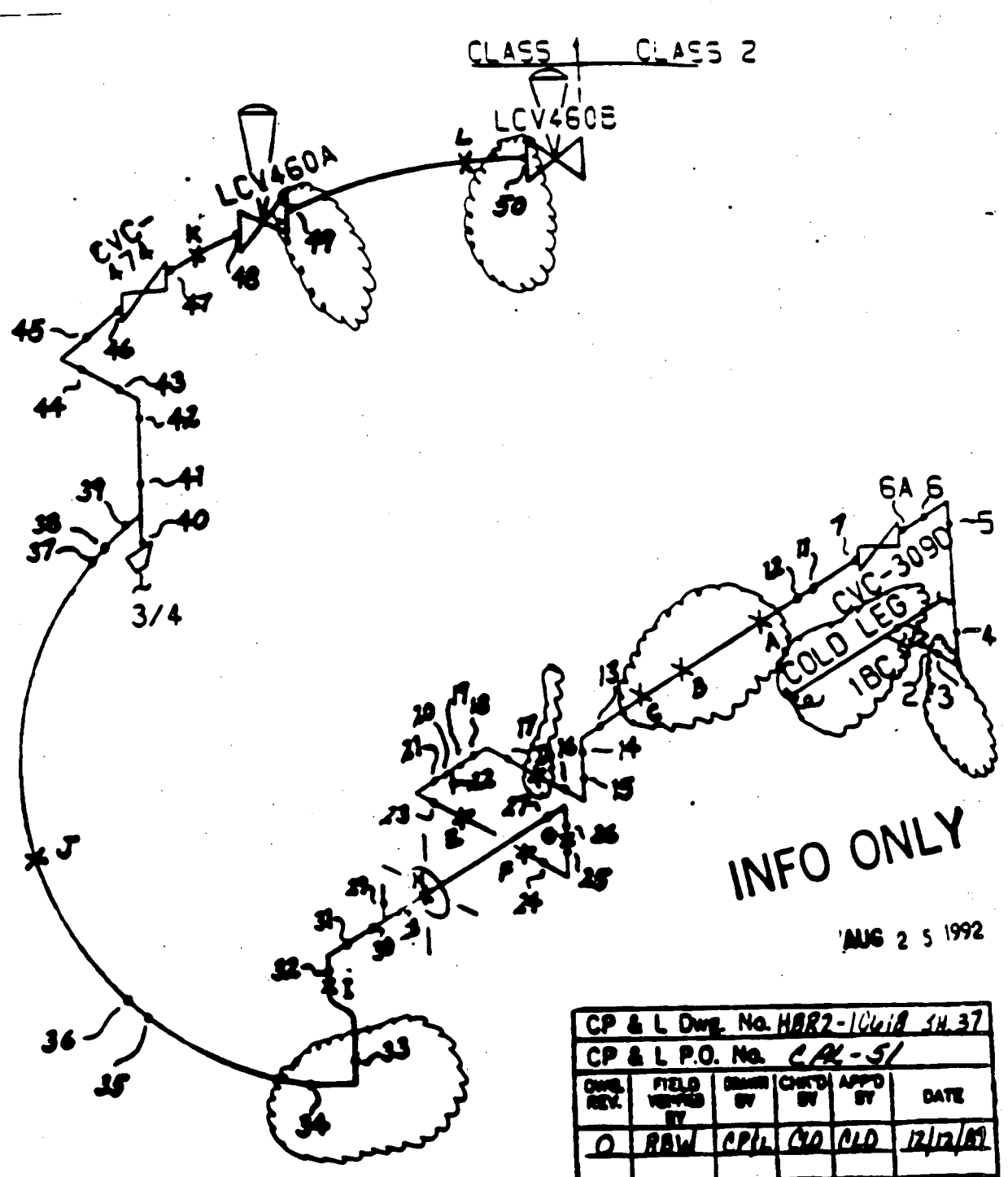
Comments:

(ISI Use Only)
☐ Pass
☐ Fail

ISI Reviewer: Richard B. Weber 10/12/93

[illegible] 10/12/93

AP III [signature] 10/12/93



CP & L Dwg. No. HBR2-10618 SH.37					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RAW	CPL	CLD	CLD	12/12/91

NOTES:

WELDS 8,9,610 DELETED BY MOD-001

CPL-125 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP A 2" LETDOWN LINE	
LINE NO. 2-CH-17	CPL-125 REV.

I certify that the image contained on this frame was made

EXPANDED
SCOPE

DATA SHEET NO. 1217-025
THERMOMETER S/N MR92-03
TEMPERATURE 84 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I
Expanded Scope

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Loop A 2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	20 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 4	No Recordable Indications	X	N/A

N/A

EXAMINER Chris D. Judd / Ch D. Judd LEVEL II DATE 9-27-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-27-93
REVIEWER Scott Ramey LEVEL III DATE 9-29-93
REVIEWER Richard B. Weber DATE 10/2/93
REVIEWER Anil A. Velladasan DATE 10/5/93

DATA SHEET NO. 1217-017
THERMOMETER S/N M892-03
TEMPERATURE 78 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I
Expanded Scope

LIQUID PENETRANT EXAMINATION

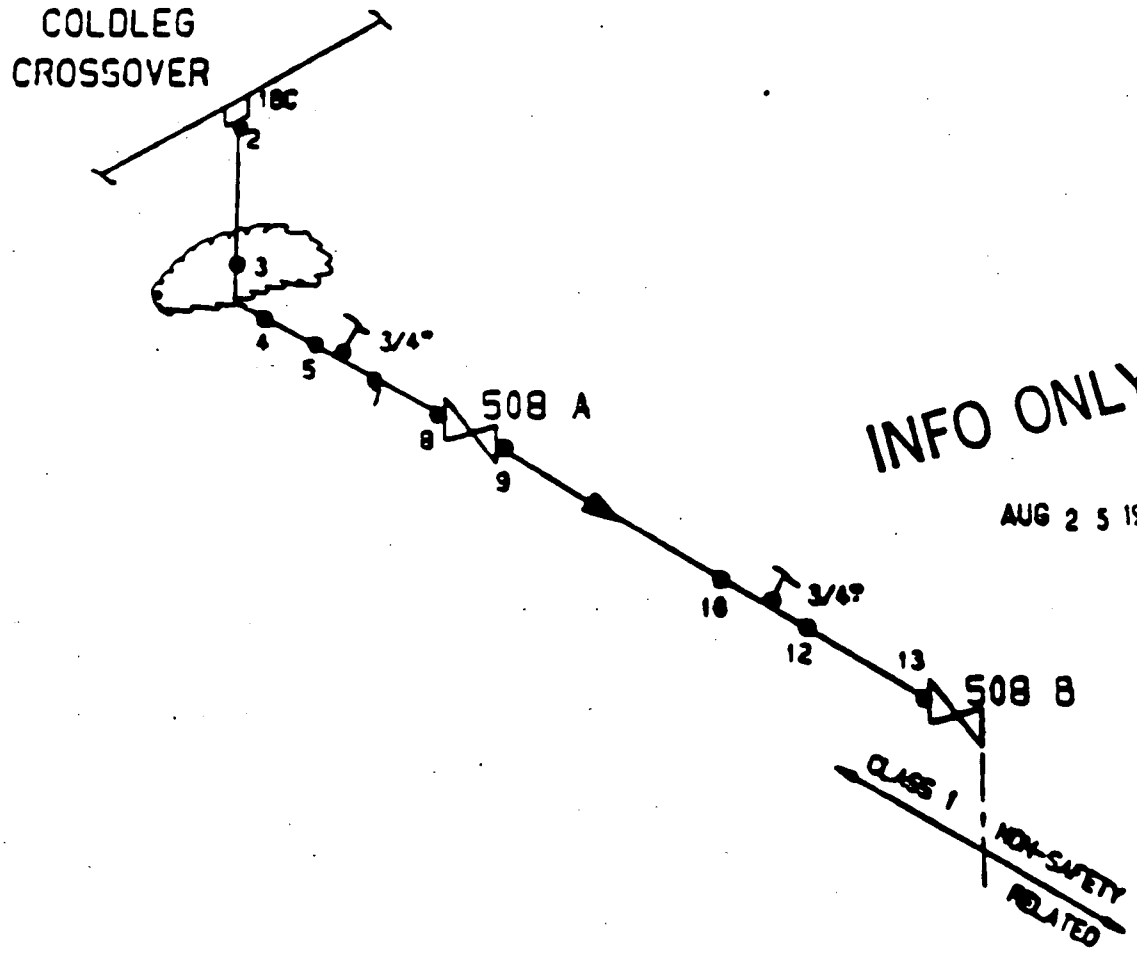
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Loop A 2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 35	No Recordable Indications	X	N/A
Weld No. 36	No Recordable Indications	X	N/A
	N A		

EXAMINER Chris O. Judd / CQ O. Judd LEVEL II DATE 9-25-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-25-93
REVIEWER Scott Lam LEVEL III DATE 9-25-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER ANII R Valladares DATE 9/29/93



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No: H882-106 18 SH. 39					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPL	CJO	CJO	12/12/91

CPL-127 REV.0

H.B. ROBINSON S.E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP B 2" DRAIN LINE	
LINE NO. 2-RC-39	CPL- 127 REV.

CP&L

I certify that the items contained on this forms was made

DATA SHEET NO. 1217-051
THERMOMETER S/N JL91-03
TEMPERATURE 74 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

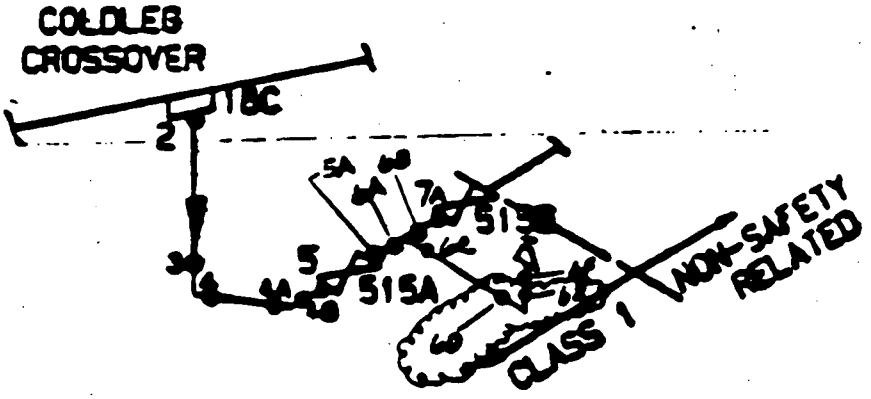
PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED LOOP B 2" DRAIN LINE ISO/DWG/SK. # CPL-127 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 4	NO RECORDABLE INDICATIONS	X	N/A
	EXPANDED SCOPE	N	A
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 10-5-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lam LEVEL III DATE 10-6-93
REVIEWER Richard A. Weber DATE 10/7/93
REVIEWER R P Wallace ANII DATE 10/7/93



INFO ONLY

AUG 2 5 1976

91-980

CPL-12B REV. 4

H.B. ROBINSON S.E. PLANT

UNIT NO. 2

DESCRIPTION: LOOP C-3" DRAIN LINE

LINE NO. 3-RC-30 CPL-12B REV. L

DATA SHEET NO. 1217-023
THERMOMETER S/N MR92-03
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL S/S
CLASS I
Expanded Scope

LIQUID PENETRANT EXAMINATION

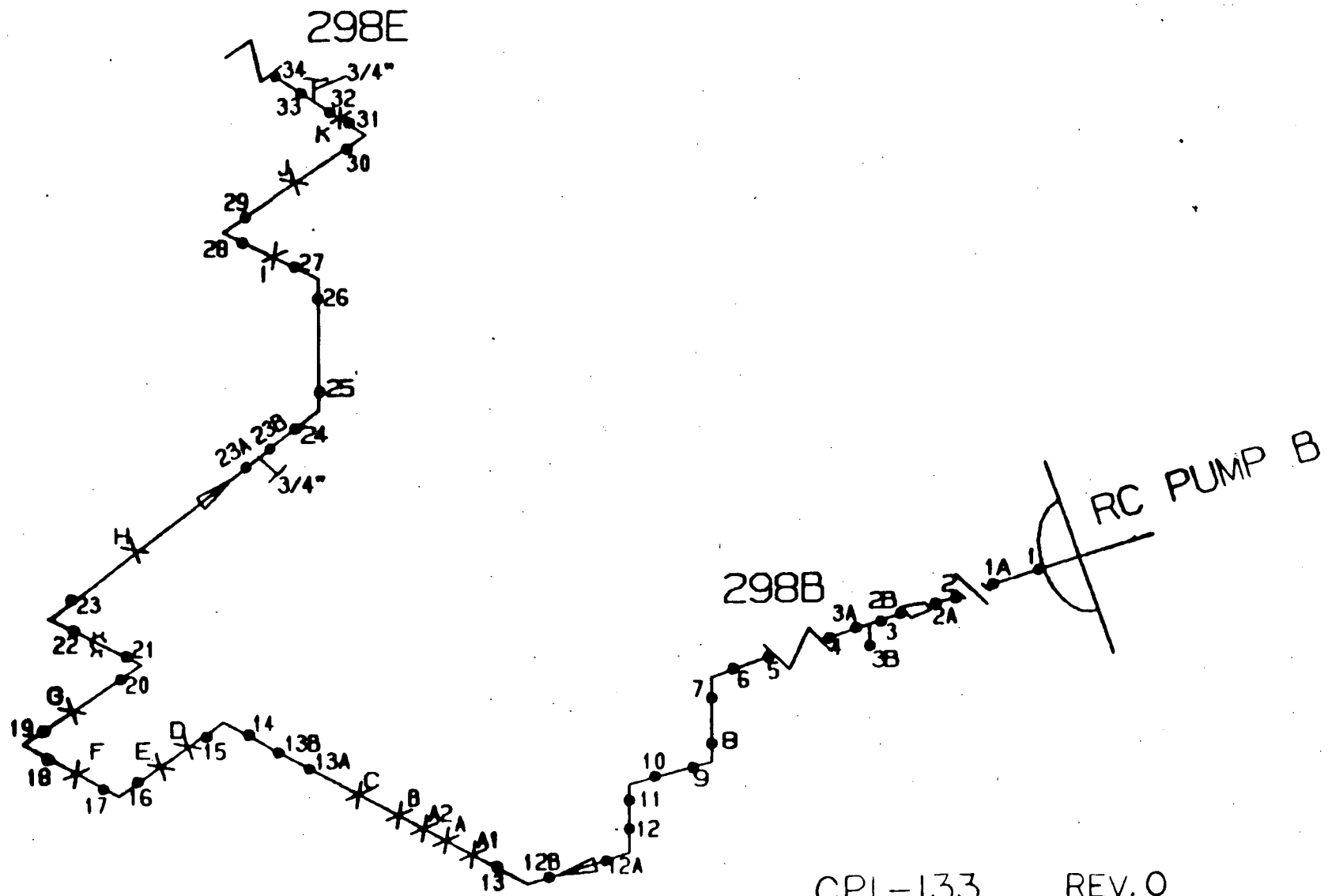
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOOP C-2 DRAIN LINE ISO/DWG/SK. # CPL-128 REVISION 1
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD # 5A	NO RECORDABLE INDICATIONS	X	N/A
	N		
	A		

EXAMINER Chris Q. Judd/CA Judd LEVEL II DATE 9-27-93
EXAMINER [signature] LEVEL I DATE 9-27-93
REVIEWER [signature] LEVEL III DATE 9-27-93
REVIEWER Garland B. Weber DATE 9/27/93
REVIEWER ANII R. Palladarsu DATE 9/29/93



CPL-133 REV. 0

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION:	LOOP B 2" SEAL INJECT. LINE

DATA SHEET NO. 1217-058
THERMOMETER S/N JL91-03
TEMPERATURE 79 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S/S
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED LOOP B 2" SEAL INJECT LINE ISO/DWG/SK. # CPL-133 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNA FLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNA FLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNA FLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNA FLUX	SKD-NF	93B04K	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 8	NO RECORDABLE INDICATIONS	X	N/A
WELD 9	NO RECORDABLE INDICATIONS	X	N/A
WELD 11	NO RECORDABLE INDICATIONS	X	N/A
WELD 12	NO RECORDABLE INDICATIONS	X	N/A
WELD 12A	NO RECORDABLE INDICATIONS	X	N/A
WELD 12B	NO RECORDABLE INDICATIONS	X	N/A
WELD 13	NO RECORDABLE INDICATIONS	X	N/A
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 10-11-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lam LEVEL III DATE 10-11-93
REVIEWER Richard B. Weber DATE 10/12/93
REVIEWER A Wallace ANII DATE 10/13/93

DATA SHEET NO. 1217-057
THERMOMETER S/N JL91-03
TEMPERATURE 79 ° F
NOMINAL THICKNESS n/a INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED LOOP B 2" SEAL INJECT LINE ISO/DWG/SK. # CPL-133 REVISION 0

DATUM POINT REFERENCE N/A

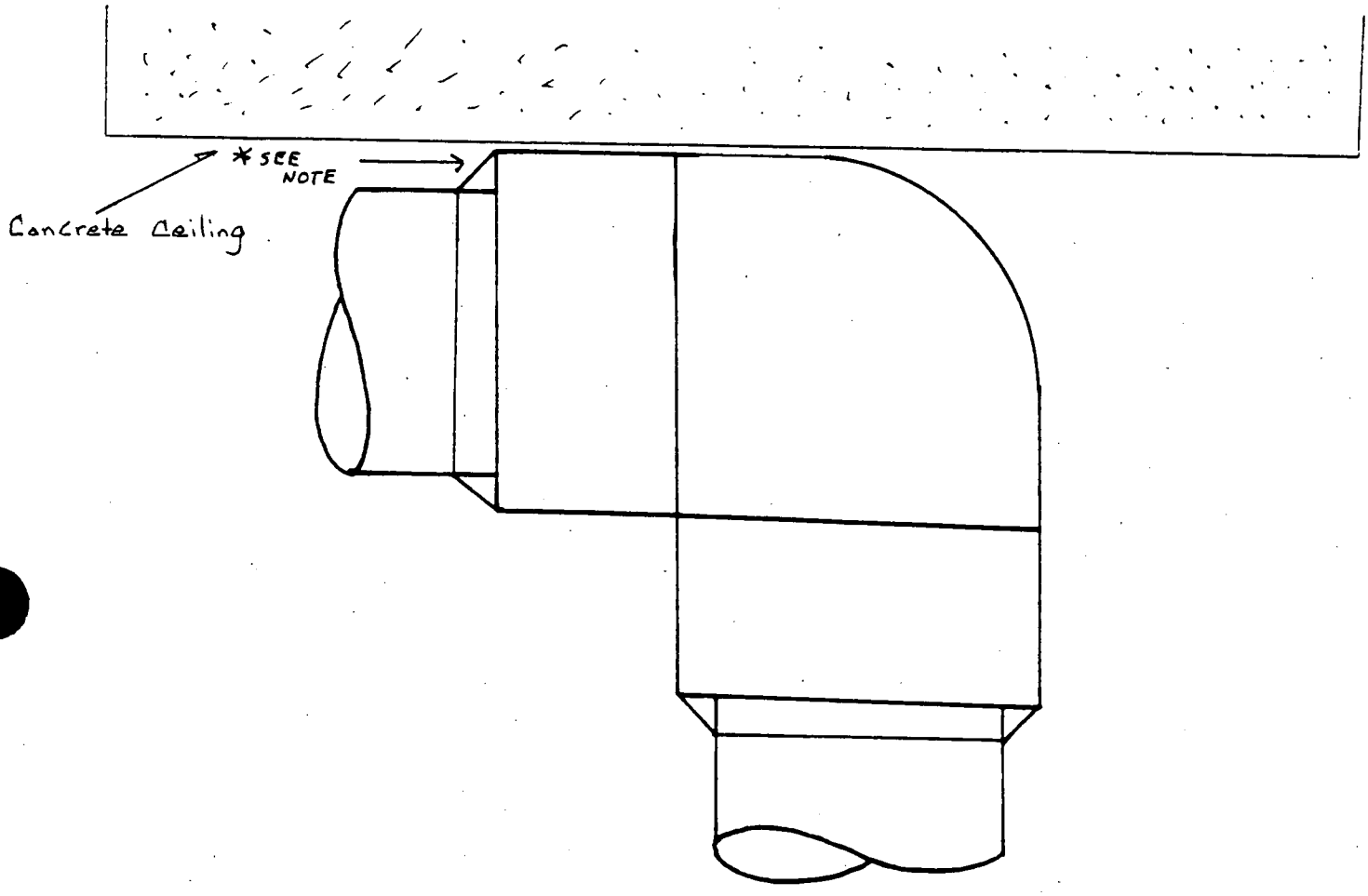
	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-S	93F03K	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	93B04K	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 10	NO RECORDABLE INDICATIONS (LIMITED EXAM)	X	N/A
	SEE ATTACHED SKETCH		
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 10-11-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-11-93
REVIEWER [signature] DATE 10/12/93
REVIEWER [signature] AN II DATE 10/13/93

1217-057

CPL-133
WELD 10



* LIMITED EXAM TOP OF SOCKET ELBOW DUE TO CEILING.

EXAMINER Steve Wollum LEVEL II DATE 10-11-93

DATA SHEET NO. 1217-060
THERMOMETER S/N JL91-03
TEMPERATURE 80 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL S.S.
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO. N/A
PAGE 1 OF 1

SYSTEM EXAMINED 2" SEAL INJECTION ISO/DWG/SK. # CPL-133 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SK-C-5	93F03K	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	15 MINUTES
REMOVER	MAGNAFLUX	SKC-5	93F03K	7 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	93B04K	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD # 14	NO RECORDABLE INDICATIONS	✓	N/A
WELD # 15	NO RECORDABLE INDICATIONS	✓	N/A
WELD # 16	NO RECORDABLE INDICATIONS	✓	N/A
WELD # 17	NO RECORDABLE INDICATIONS	✓	N/A
	N/A		

EXAMINER David M Martin LEVEL II DATE 10/11/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott [illegible] LEVEL III DATE 10-12-93
REVIEWER [illegible] B. Weber DATE 10/12/93
REVIEWER R Valladares ANII DATE 10/13/93

DATA SHEET NO. 1217-041
THERMOMETER S/N 462
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 1
Expanded Scope

LIQUID PENETRANT EXAMINATION

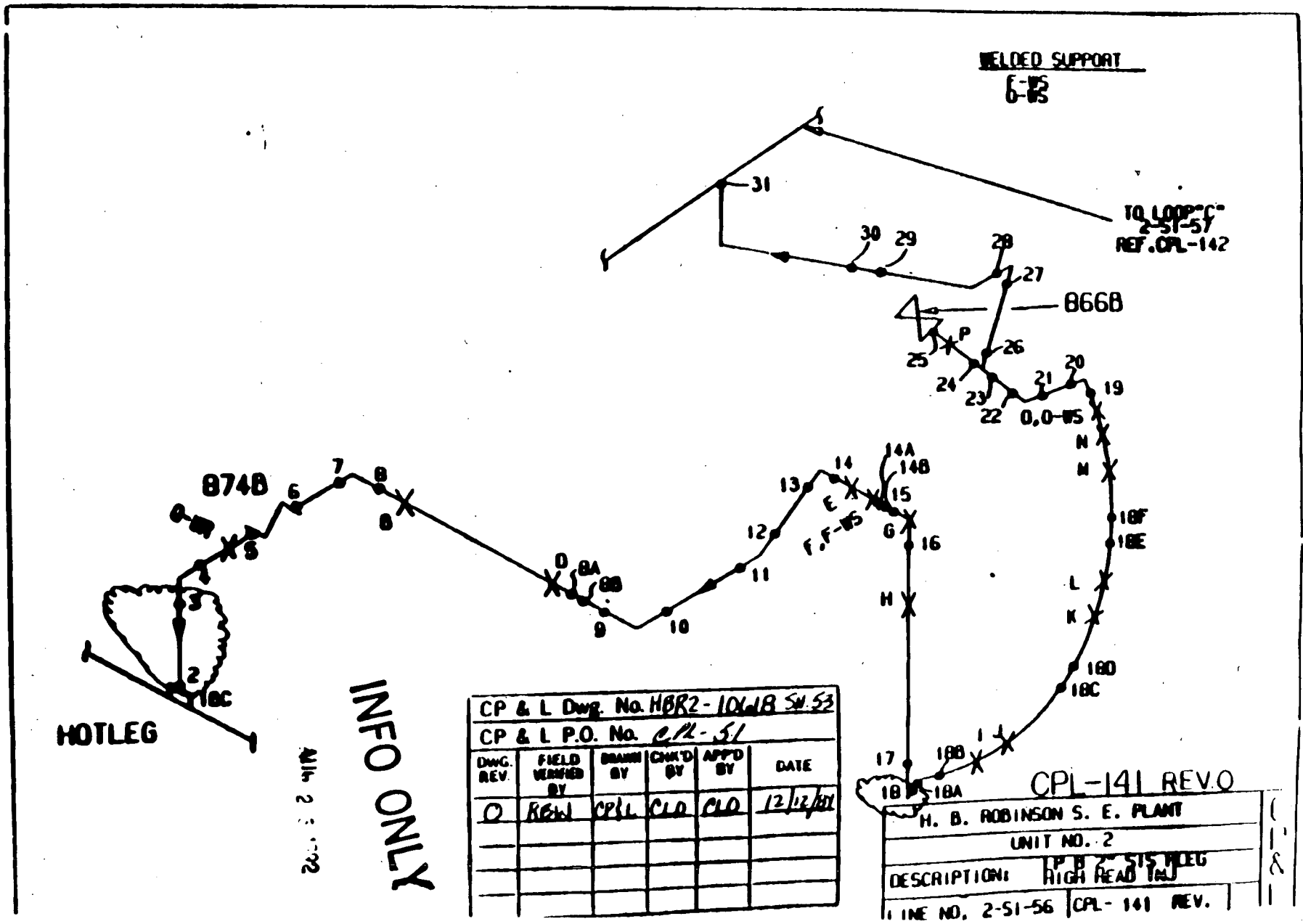
PROCEDURE 1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED RTD ISO/DWG/SK. # 136 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT		SKL-SP	93E01K	15 MINUTES
REMOVER		SKC-NF	92D02P	5 MINUTES
DEVELOPER		SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld 1	No indications	X	N/A
	N		
	A		

EXAMINER [signature] LEVEL III DATE 10-3-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10/4/93
REVIEWER [signature] DATE 10/5/93
REVIEWER [signature] DATE 10/5/93


WELDED SUPPORT
E-W5
G-W5
TO LOOP "C"
2-SI-57
REF. CPL-142
8668
8748
HOTLEG
INFO ONLY
CP & L Dwg. No. HBR2-10418 SH 53
CP & L P.O. No. CPL-51
DWG. REV.
FIELD VERIFIED BY
DRAWN BY
CHK'D BY
APP'D BY
DATE
0
RGW
CPL
CLO
CLO
12/12/01
H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION: 12" & 2" SI HOT LEG HIGH HEAD INJ.
LINE NO. 2-SI-56
CPL-141 REV.
CPL-141 REV.0

DATA SHEET NO. _____
THERMOMETER S/N MR92-04
TEMPERATURE 87 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I
Expanded Scope

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED S.I. ISO/DWG/SK. # CPL-141 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 18A	No Recordable Indications	X	N/A
	N A		

EXAMINER Chris D. Judd/Chris D. Judd LEVEL II DATE 9-22-93
EXAMINER Benjamin Snider LEVEL I DATE 9-22-93
REVIEWER Scott Lam LEVEL III DATE 9-24-93
REVIEWER Richard B. Weber DATE 9/27/93
REVIEWER [illegible] DATE 9/29/93

DATA SHEET NO. 1217-042
THERMOMETER S/N MR92-04
TEMPERATURE 72 ° F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 1
Expanded Scope

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LP B 2" SIS HLEG HIGH HEAD INJ ISO/DWG/SK. # CPL-141 REVISION 0

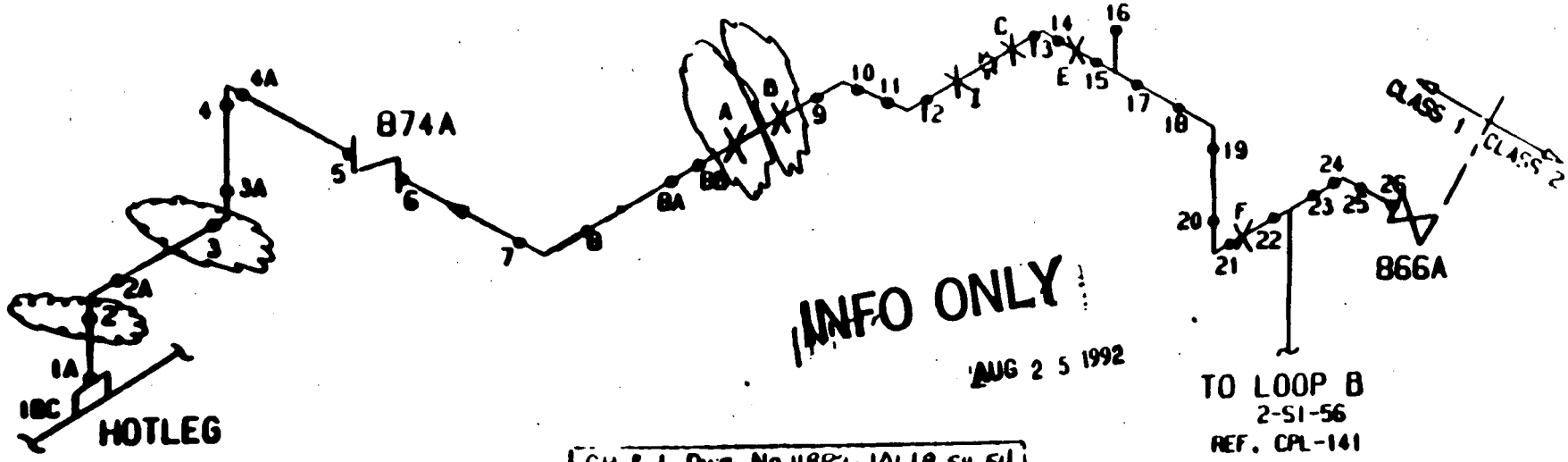
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "18B"	NO INDICATIONS NOTED	X	N/A
N/A	N/A	N/A	

EXAMINER Kenneth R. Mance LEVEL II DATE 10/1/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lowe LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER Ann A. Wallace DATE 10/5/93

SPRING HANGERS
F, I



INFO ONLY

AUG 2 5 1992

CP & L Dwg. No. 11BR2-10618 SH 54					
CP & L P.O. No. CPL-51					
DWG. REV.	FIELD VERIFIED BY	DRAWN BY	CHK'D BY	APP'D BY	DATE
0	RBW	CPSL	CLD	CLD	12/12/89

CPL-142 REV. 0

H. B. ROBINSON S. E. PLANT	
UNIT NO. 2	
DESCRIPTION: LOOP B 2" RCLB HIGH HEAD INJ.	
LINE NO. 2-SI-57	CPL-142 REV.

DATA SHEET NO. 1217-023
THERMOMETER S/N MR92-04
TEMPERATURE 80 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 1
Expanded Scope

LIQUID PENETRANT EXAMINATION

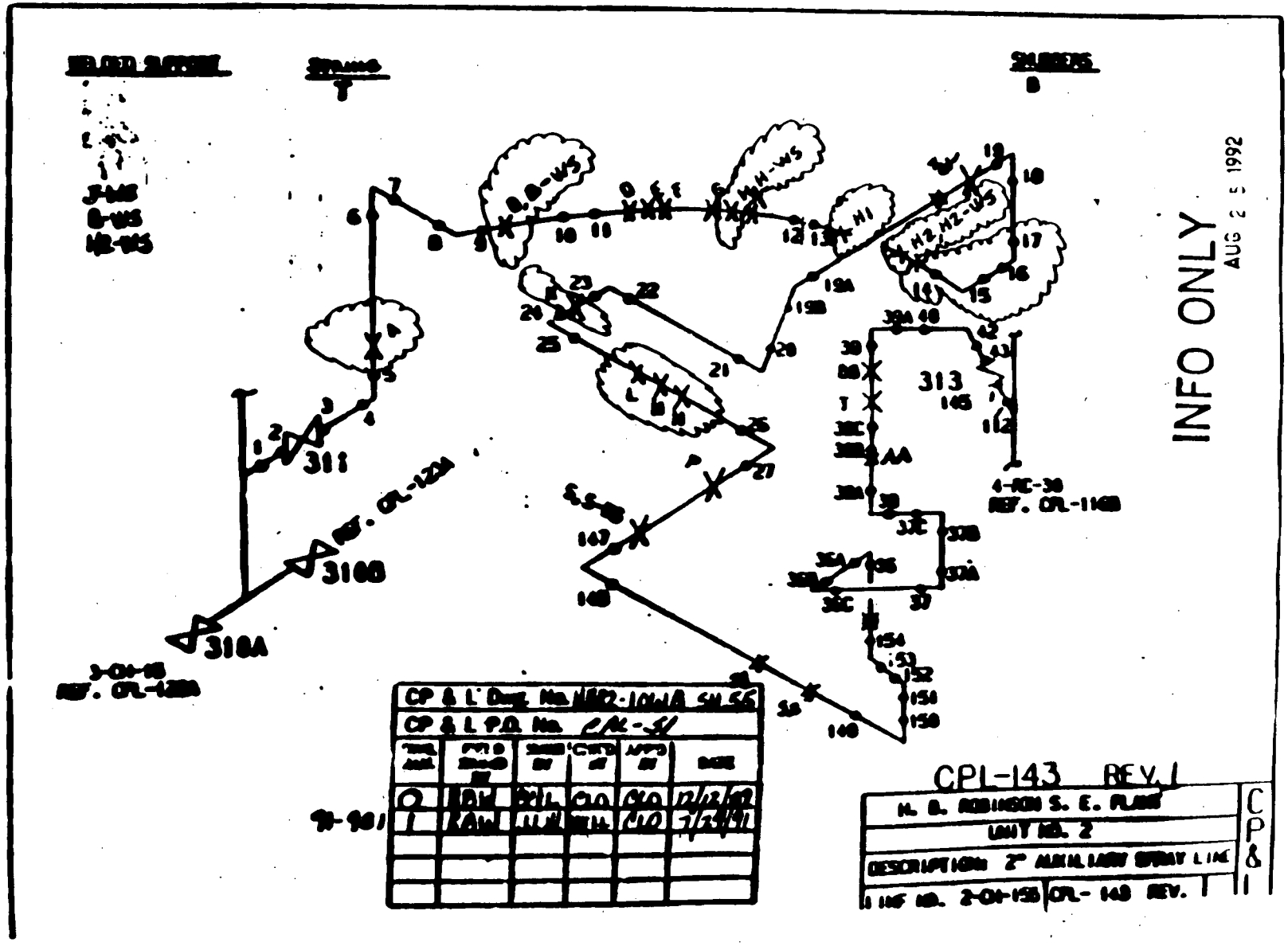
PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED SG LOOP "C" ISO/DWG/SK. # CPL-142 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "2A"	NO RECORDABLE INDICATION	X	N/A
" "3A"	NO INDICATION NOTED	X	
" "6"	NO RECORDABLE INDICATION	X	
N/A	N/A	N/A	

EXAMINER Kenneth R. Hamm LEVEL II DATE 9/28/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamm LEVEL III DATE 9-29-93
REVIEWER Richard B. Weber DATE 9/29/93
REVIEWER Bill R. Valladares DATE 9/29/93


INFO ONLY
AUG 2 5 1992
313
311
310B
310A
4-HC-30
REF. CPL-1148
CP & L Dwg. No. NH2-10148 SH. 56
CP & L P.O. No. CAK-51
CPL-143 REV. 1
H. B. ROBINSON S. E. PLANT
UNIT NO. 2
DESCRIPTION 2" AUXILIARY SPRAY LINE
LINE NO. 2-CH-155 CPL-143 REV. 1
CP & L

DATA SHEET NO. 1217-020
THERMOMETER S/N MR92-04
TEMPERATURE 82 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL SS
CLASS 1
EXPANDED SCOPE

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Aux Spray Line ISO/DWG/SK. # CPL-143 REVISION 1
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	"	SKL-SP	93E01K	15 MINUTES
REMOVER	"	SKC-NF	92D02P	5 MINUTES
DEVELOPER	"	SKD-NF	92A01P	7 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD "19"	NO INDICATIONS NOTED	X	N/A
WELD "19A"	" " "	X	
WELD "19B"	" " "	X	
WELD "18"	" " "	X	
N/A	N/A	N/A	

EXAMINER Kenneth R. Hance LEVEL II DATE 9/25/93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamm LEVEL III DATE 9-25-93
REVIEWER Richard Webster DATE 9/29/93
REVIEWER Will Williadams DATE 9/29/93

DATA SHEET NO. 1223-035
PAGE 1 OF 8
5379-1082
Welds 1, 2 and 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. N/A

INSTRUMENT

Model USK-7S
Serial No. 31459-1499
Sweep Length 5.55 Delay 9.03
Range .5
Gain (coarse) 20 dB
Gain (fine) 14 dB
Reference Sensitivity 34 dB
Remarks: N/A

SEARCH UNIT

Serial No. H28181
Size .25"
Frequency 5 MHz
Mode Long.
Nom. Angle 0 °
Measured Angle 0 °
Cable Type self contained
Cable Length 6'
Remarks: NA

CALIBRATION BLOCK

No. Component
"T" .3 Dia. 3"
Temperature 77 °F
Thermometer S/N CC HBR16016

CALIBRATION

0° [X] Axial [NA] Circ. [NA]
Metal Path [NA] Depth [X]
Each Major Screen Div. = .1"
Remarks NA

COUPLANT

Brand ultragel
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

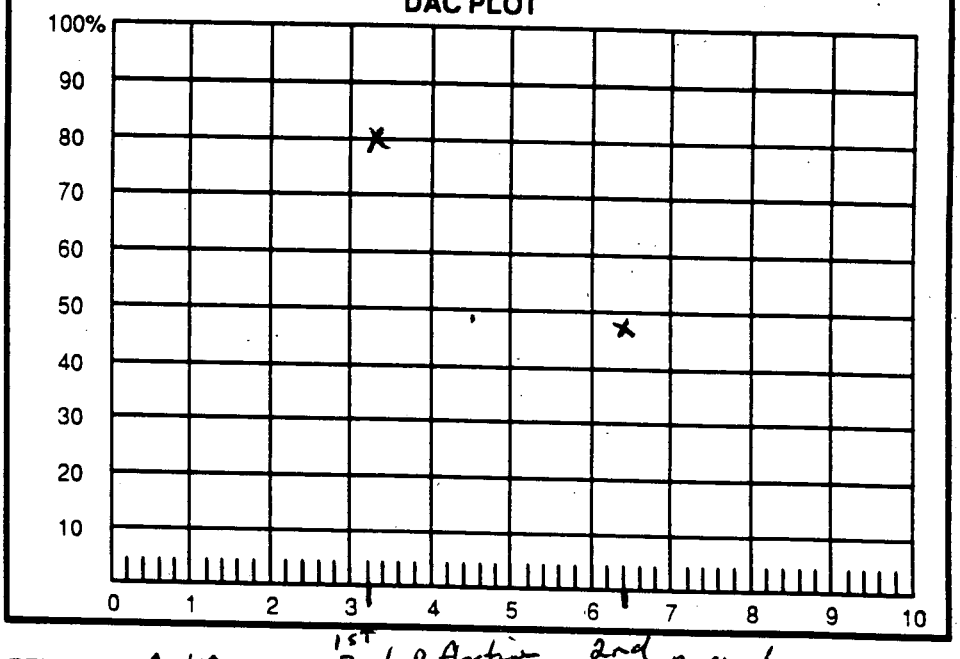
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0425
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	0445

DAC PLOT



REMARKS: N/A

EXAMINERS 1 [signature] LEVEL III DATE 10-19-93
2 [signature] CPL LEVEL I DATE 10/19/93
REVIEWERS 1 [signature] LEVEL N/A DATE 10/20/93
2 [signature] LEVEL ANII DATE 10/20/93
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

PRE-SERVICE

DATA SHEET NO. 1223-035
PAGE 2 OF 8

5379-1082
Welds 1, 2 and 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. 0

INSTRUMENT

Model USK-7
Serial No. 27276 749
Sweep Length 9.35 Delay 7.75
Range .5
Gain (coarse) 20 L = 20 dB
Gain (fine) 22 L = 24 dB
Reference Sensitivity 42 L = 44 dB
Remarks:

SEARCH UNIT

Serial No. K18909
Size .25
Frequency 5 MHz
Mode Shear
Nom. Angle 45 °
Measured Angle 45 °
Cable Type RG 58 174 CU 50-1943
Cable Length 1 X 6'
Remarks: .3" = exit point to front of wedge

CALIBRATION BLOCK

No. BSEP HT# 2P4518
"T" .3 Dia. 3
Temperature 71 ° F
Thermometer S/N CC HBR 16016

CALIBRATION

0° N/A Axial X Circ. X
Metal Path X Depth N/A
Each Major Screen Div. = .25
Remarks N/A

COUPLANT

Brand Ultragel
Batch No. 093001

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	5

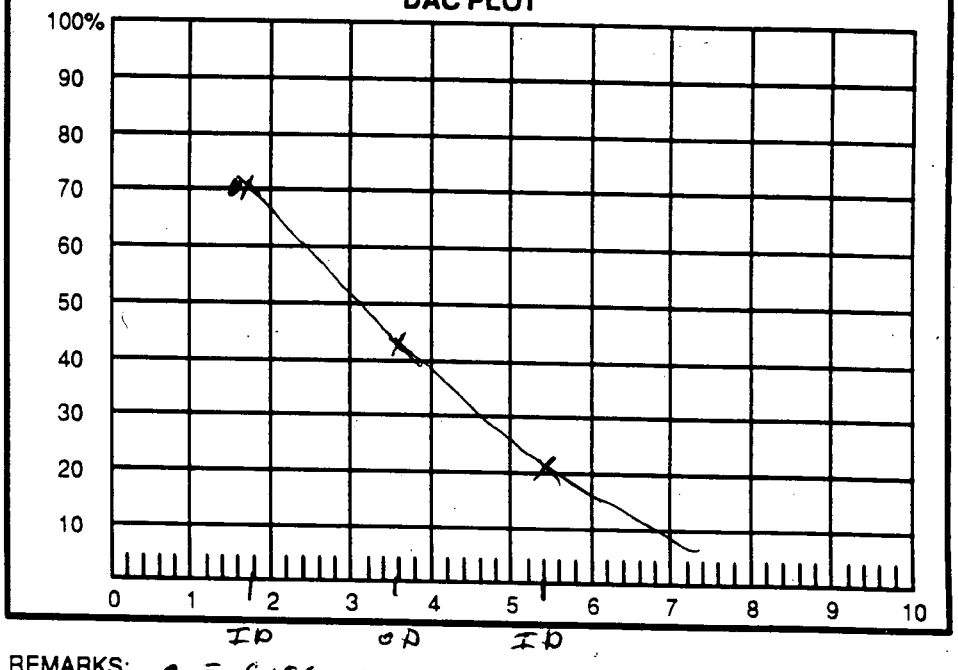
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	40
80	-12	20
40	+6	80
20	+12	80

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0345
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	0530

DAC PLOT



REMARKS: ● = circ
X = Axial

EXAMINERS 1 [signature] LEVEL III DATE 10-19-93
2 [signature] CPC LEVEL I DATE 10/19/93

REVIEWERS 1 Richard B. Weber LEVEL N/A DATE 10/20/93
2 R Valladares LEVEL AII DATE 10/20/93
3 _____ LEVEL _____ DATE _____

NES NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-035
PAGE 3 OF 8

5379-1082
Welds 1 2 and 3

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. SP 1223
REV. 0
CHANGE NO. 0

INSTRUMENT

Model USK-7
Serial No. 27276-3784
Sweep Length 485 Delay 748
Range 2.5
Gain (coarse) 20 ± = 20 dB
Gain (fine) 26 ± = 28 dB
Reference Sensitivity 46 ± = 48 dB
Remarks:

SEARCH UNIT 10-19-93

Serial No. ~~K18904~~ A24932
Size .25
Frequency 5 MHz
Mode 5
Nom. Angle 60 °
Measured Angle 58 °
Cable Type RG 174 U
Cable Length 20'
Remarks: Exit point to front of wedge .3"

CALIBRATION BLOCK

No. BSEP HT # 2P4518
"T" .3 Dia. 3"
Temperature 71 ° F
Thermometer S/N CC HBR 16016

CALIBRATION

0° N/A Axial ☒ Circ. ☒
Metal Path ☒ Depth N/A
Each Major Screen Div. = .25"
Remarks

VERTICAL LINEARITY

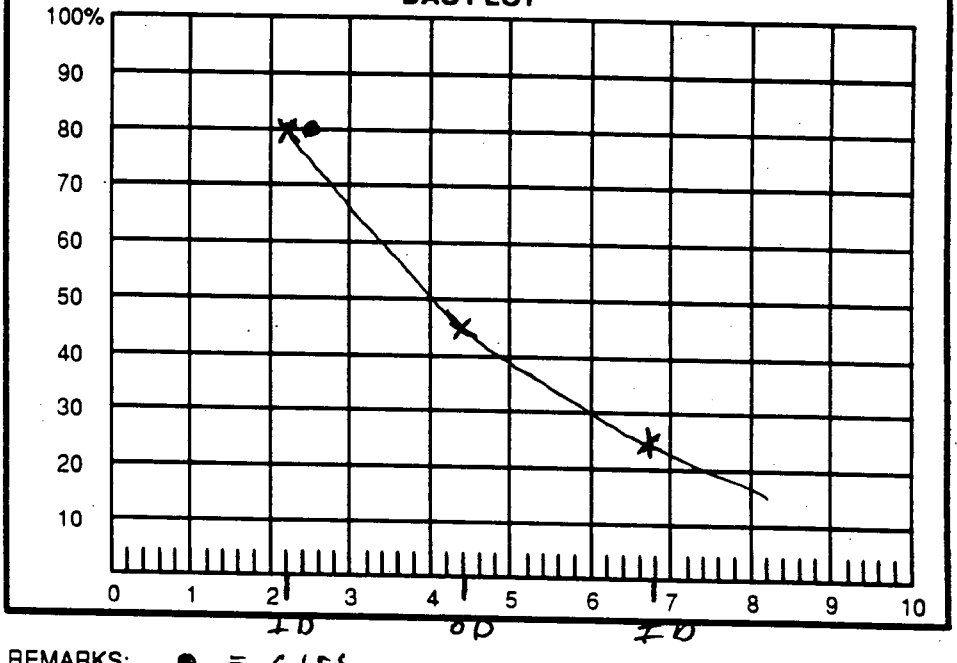
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1	100	50	6	50	25
2	90	45	7	40	20
3	80	40	8	30	15
4	70	35	9	20	10
5	60	30	10	10	15

COUPLANT

Brand Ultragel
Batch No. 093001

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	41
80	-12	22
40	+6	78
20	+12	78

CAL. CHECKS

CAL. CHECKS	TIME
INITIAL CAL.	0400
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	0545

REMARKS: ● = circ
X = axial

EXAMINERS 1 Scott Lamm LEVEL III DATE 10-19-93
2 Pete [illegible] LEVEL I DATE 10/19/93
REVIEWERS 1 Richard B. Weber LEVEL N/A DATE 10/20/93
2 R Valladares LEVEL BNII DATE 10/20/93
3 LEVEL DATE

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-035
PAGE 4 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM S1
ISO/DWG. NO. 5379-1082 REV. 35
THERMOMETER S/N CCHBR16016
COMPONENT TEMP. 77 °F

EXAM ITEM

Weld 1

SCAN 0° / SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	NA	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	NA	NA	NA	X	NA	NA	X	NA	X	X	NA

REMARKS: Pipe to valve

SCAN 45° / SCAN dB *				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	NA	YES	NO	YES	NO	YES	NO	ACC.	REJ.
NA	X	X	NA	X	NA	NA	X	NA	X	X	NA

REMARKS: * 48 dB for axial scan; 50 dB for circ scan. Pipe to valve scanned pipe side only

SCAN 60° / SCAN dB *				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	X	N/A	X	N/A	N/A	X	N/A	X	X	N/A

REMARKS: * 52 dB for axial scan; 54 dB for circ. scan Pipe to valve scanned from pipe side only

SCAN ~~___°~~ / SCAN dB ~~___~~				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
								NJ			

REMARKS:

EXAMINERS:
1 Scott Lane LEVEL III DATE 10-19-93
2 Steve Cole LEVEL I DATE 10/19/93

REVIEWERS:
1 Richard B. Weber LEVEL N/A DATE 10/20/93
2 R Balladares LEVEL ANII DATE 10/20/93
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-035
PAGE 5 OF 8

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM S1
ISO/DWG. NO. 5379-1082 REV. 35
THERMOMETER S/N CCHBR16016
COMPONENT TEMP. 77 ° F

EXAM ITEM

Weld 2

SCAN 0 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	NA	NA	A	X	NA	NA	X	NA	X	X	NA

REMARKS:

SCAN 45 ° SCAN dB *				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	NA	YES	NO	YES	NO	YES	NO	ACC.	REJ.
NA	X	X	NA	X	NA	NA	X	NA	X	X	NA

REMARKS: * 48dB for axial scan; 50 dB for circ scan. Elbow to pipe scanned both sides.

SCAN 60 ° SCAN dB 52				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N	YES	NO	YES	NO	YES	NO	ACC.	REJ.
NA	X	NA	A	X	NA	X	NA	NA	X	X	NA

REMARKS: See attached Indication Report Sheet for geometric indication. Scanned from both sides

SCAN 60 ° SCAN dB 54				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	N	YES	NO	YES	NO	YES	NO	ACC.	REJ.
NA	NA	X	A	X	NA	NA	X	NA	X	X	NA

REMARKS: N A

EXAMINERS:
1 Scott Lem LEVEL III DATE 10-19-93
2 [illegible] LEVEL I DATE 10/19/93

REVIEWERS:
1 Richard B. Weber LEVEL N/A DATE 10/20/93
2 R Valladares LEVEL ANII DATE 10/20/93
3 _____ LEVEL _____ DATE _____

EXAM ITEM: Weld 2

ISO/DWG. NO.: 5379-1082 Sht. 2 R 35

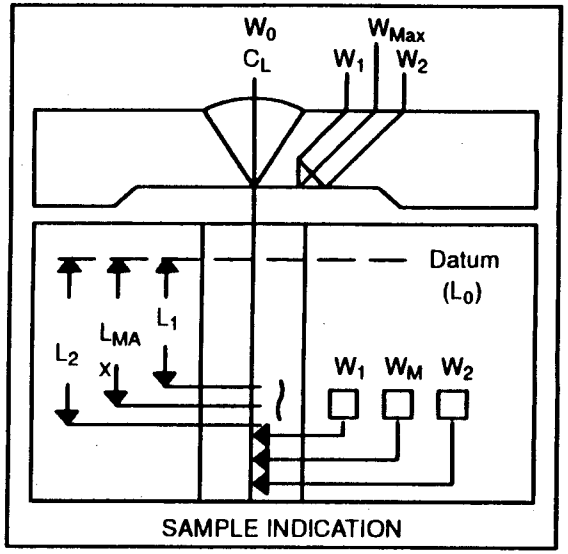
ULTRASONIC INDICATION REPORT SHEET

- [x] PIPING WELDS
- [N/A] FERRITIC VESSELS ≥ 2" T *
- [N/A] OTHER N/A

DATA SHEET NO. 1223-035

PAGE 6 OF 8

SEARCH UNIT ANGLE 58 ° W_0 LOCATION Weld ℄ L_0 LOCATION TDC

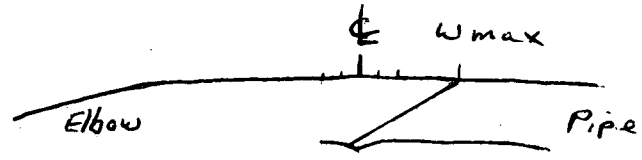


SAMPLE INDICATION

MP	Metal Path	W max	Distance from W_0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W_1	Distance from W_0 at 50% of DAC (fwd)
L	Distance from Datum	W_2	Distance from W_0 at 50% of DAC (backward)

Ind.	%	W	MAX	FWD 50%	FWD DAC*	BACKWARD 50%	BACKWARD DAC*	L_1	L	L_2	RBR	S.U.	REMARKS
No.	of DAC*	W	MP	W_1	MP	W_2	MP	50% DAC	max	50% DAC	amp	Loc.	
1	80	.5	.6	N/A	N/A	N/A	N/A	N/A	1.5" cw	N/A	N/A	Pipe side	Root geometry 360° at intermittent amplitudes
								N/A					
								A					

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.



EXAMINERS 1 Scott Lee LEVEL III DATE 10-19-93

2 Bob X LEVEL I DATE 10/19/93

REVIEWERS 1 Richard B. Weber LEVEL N/A DATE 10/20/93

2 A Balladares LEVEL AWII DATE 10/20/93

3 _____ LEVEL _____ DATE _____

NES 9/90

NUCLEAR ENERGY SERVICES, INC.

DATA SHEET NO. 1223-035
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ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM 51
ISO/DWG. NO. 5379-7382 REV. 35
THERMOMETER S/N CCHBR 16016
COMPONENT TEMP. 77 ° F

EXAM ITEM

Weld 3

SCAN 0 ° SCAN dB 40				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	NA	YES	NO	YES	NO	YES	NO	ACC.	REJ.
X	NA	NA	NA	X	NA	NA	X	NA	X	X	NA

REMARKS: Elbow to Flange

SCAN 45 ° SCAN dB *				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	NA	YES	NO	YES	NO	YES	NO	ACC.	REJ.
NA	X	X	NA	X	NA	NA	X	NA	X	X	NA

REMARKS: * 48 dB for axial scan; 50 dB for circ scan. Elbow to flange scanned from elbow side only. See attached for obstruction.

SCAN 60 ° SCAN dB *				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
N/A	X	X	N/A	N/A	X	N/A	X	N/A	X	X	N/A

REMARKS: * 52 dB for axial scan; 54 dB for circ scan. Elbow to flange scanned from elbow side only. See attached for scan path obstruction.

SCAN ° SCAN dB				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.
							NI				

REMARKS:

A

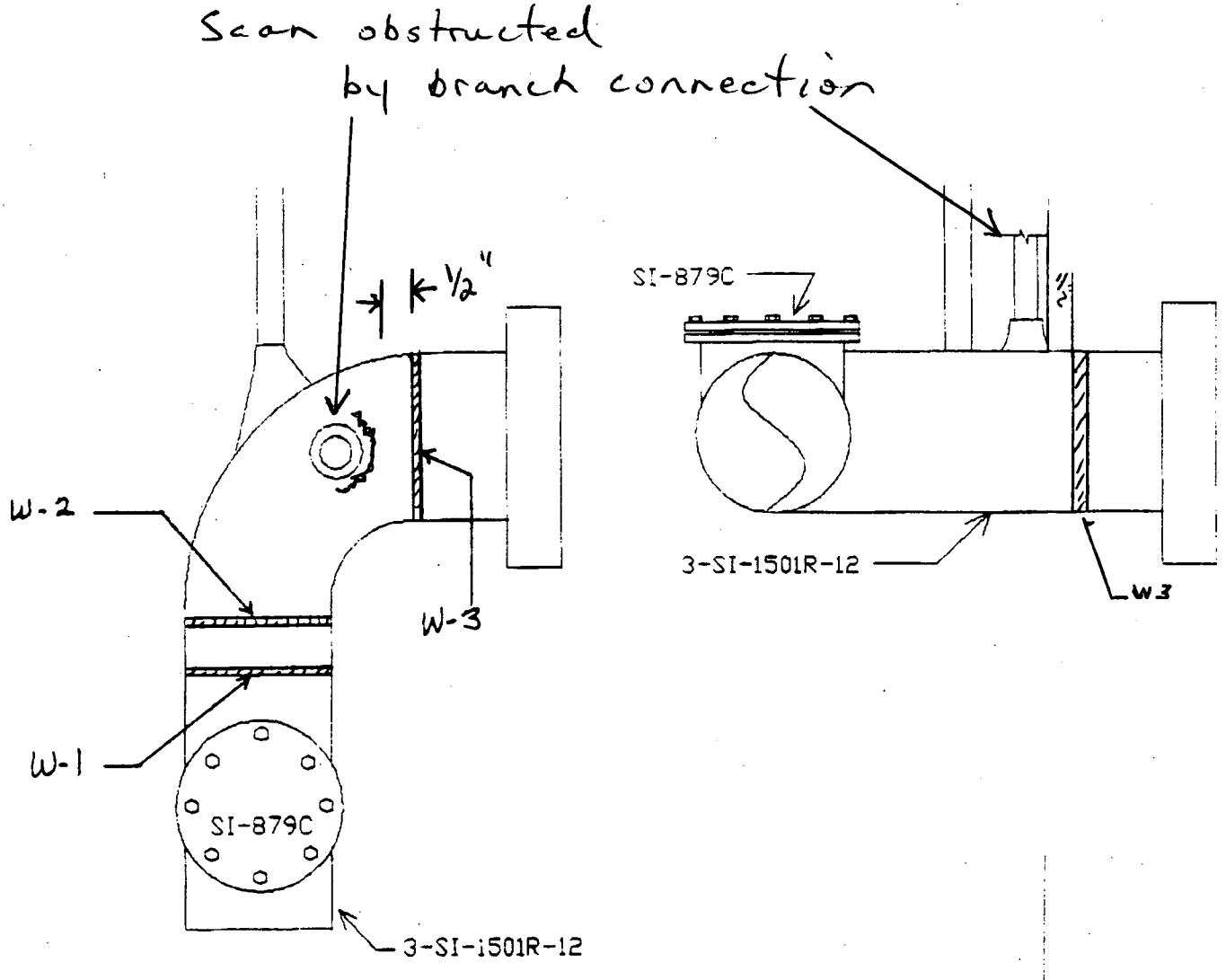
EXAMINERS:
1 [signature] LEVEL III DATE 10-19-93
2 [signature] LEVEL I DATE 10/19/93

REVIEWERS:
1 Richard B. Weber LEVEL N/A DATE 10/20/93
2 R Balladares LEVEL AN II DATE 10/20/93
3 _____ LEVEL _____ DATE _____

NES 9/90 – REV. 1

NES NUCLEAR ENERGY SERVICES, INC.

1223-035
8 of 8



Scott Lewis LIII 10-19-93

QC Level I 10/19/93

To: DICK WEBER@PLANT@CPL RNP
Cc: Ray Hanford@RNP@CPL NED,John Sanders@PLANT@CPL RNP
Bcc:
From: Charlie Griffin@RNP@CPL NED
Subject: EVAL./REMOVAL OF PT INDICATION ON SI ACCUMULATOR NOZZLE "A-6"
Date: Monday, October 4, 1993 23:37:13 EDT
Attach:
Certify: Y
Forwarded by:

WHILE PERFORMING LIQUID PENETRANT (PT) EXAMINATIONS ON THE SI ACCUMULATOR NOZZLES, A LINEAR INDICATION WAS DETECTED EXTENDING APPROXIMATELY 360 DEGREES AROUND NOZZLE A-6 (1" NITROGEN GAS INLET CONNECTION AT TOP OF ACCUMULATOR "A"). SINCE THE INTERGRANNULAR STRESS CORROSION CRACKS WHICH WERE DISCOVERED IN TWO OF THE RNP ACCUMULATOR NOZZLES IN RFO-13 WERE "AXIAL" INDICATIONS (AS WERE THOSE IGSCC CRACKS DISCOVERED AT OTHER UTILITIES ON ACCUMULATOR NOZZLES), THE CIRCUMFERENTIAL INDICATION DETECTED THIS OUTAGE ON A-6 WAS BELIEVED TO BE SOMETHING DIFFERENT. UPON CLOSE OBSERVATION OF THE NOZZLE, IT WAS OBVIOUS TO ME THAT THE INDICATION WAS ACTUALLY A "VIBRATORY TOOL ENGRAVING MARK". THE "VIBRATORY TOOL MARK" HAD BEEN APPLIED ON THE NOZZLE SOMETIME SUBSEQUENT TO A BASE METAL REPAIR THAT WAS PERFORMED ON THE NOZZLE DURING RFO-13 (THE REPAIR HAD BEEN PERFORMED IN RFO-13 TO RESTORE BASE METAL WHICH HAD BEEN REMOVED IN AN EFFORT TO ACQUIRE BASE METAL FILINGS FOR CHEMISTRY ANALYSIS).

RECENT TESTS CONDUCTED AT THE HARRIS E&E CENTER (SPRING 1993) HAVE DEMONSTRATED THAT "VIBRATORY TOOL ENGRAVING MARKS," SUCH AS THE ONES OBSERVED ON A-6, DO NOT PENETRATE STAINLESS STEEL MATERIALS DEEPER THAN APPROX. 0.006 INCH.

THE MAJORITY OF THE VIBRATORY TOOL MARK ON A-6 WAS REMOVED BY LIGHT POLISHING (VERY LIGHT FILING AND EMORY CLOTH), ALTHOUGH SOME LIGHT TRACES COULD STILL BE SEEN VISUALLY. THE SUBSEQUENT PT EXAMINATION WAS "ACCEPTED."

WHEN ULTRASONIC EXAMINATIONS ARE PERFORMED ON THE NOZZLE, THE NDE INSPECTOR SHOULD VERIFY THE WALL THICKNESS OF THE NOZZLE TO FURTHER DEMONSTRATE THAT THE LIGHT POLISHING DID NOT REMOVE SIGNIFICANT WALL THICKNESS.

DATA SHEET NO. _____
THERMOMETER S/N MR92-03
TEMPERATURE 65 ° F
NOMINAL THICKNESS .1" INCHES
MATERIAL S/S
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 2

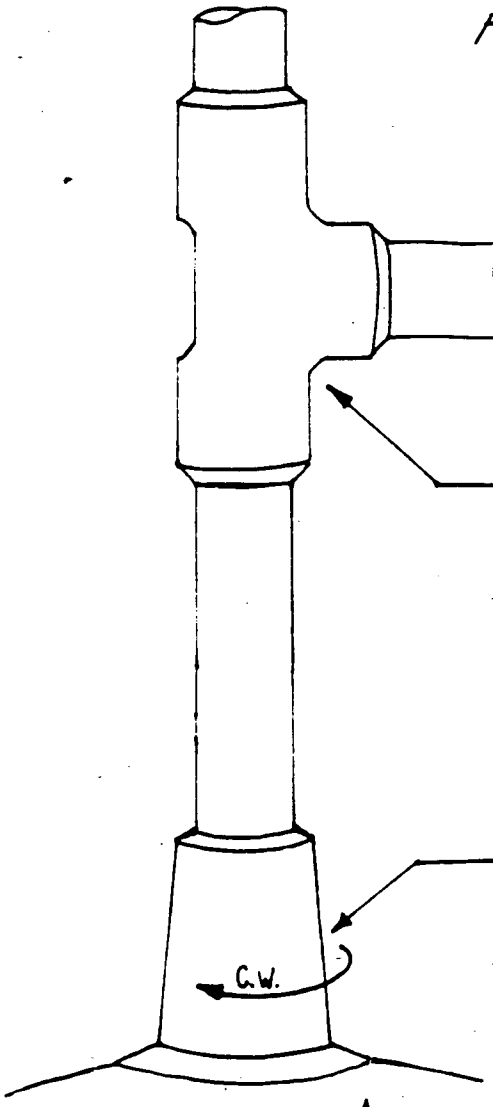
SYSTEM EXAMINED LOW PRESSURE SAFETY INJECTION ISO/DWG/SK. # ACCUMULATOR A REVISION N/A
DATUM POINT REFERENCE IN LINE WITH INSIDE RADIUS OF TEE ABOVE

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
A-6 1"-GAS INLET CONN.	LINEAR INDICATIONS (SEE ATTACHED SKETCH)	N/A	X
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 9-18-93
EXAMINER [signature] LEVEL I DATE 9-18-93
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER _____ DATE _____
REVIEWER _____ DATE _____

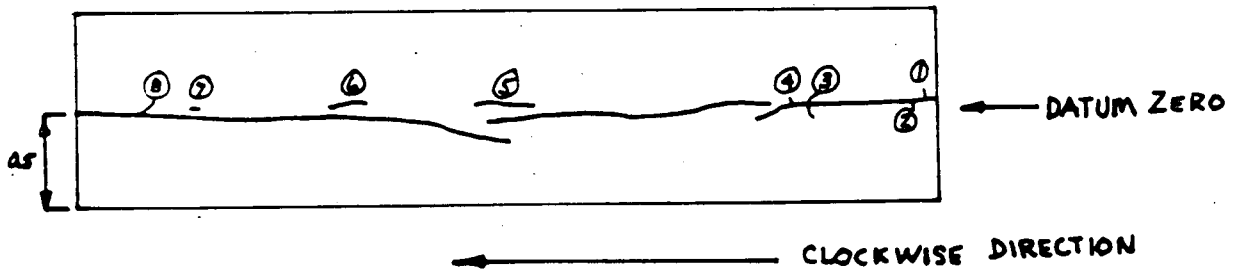
ACCUMULATOR H
1" GAS INLET CONN.



ACCUMULATOR A

- NOTE -

DATUM ZERO IN LINE WITH INSIDE RADIUS OF TEE ABOVE



1. 0.050	5. 0.400
2. 0.050	6. 0.250
3 0.100	7. 0.050
4. 0.050	8. 0.100

INTERMITTEN LINEAR INDICATION 360° AROUND THE CIRCUMFERENCE OF INLET CONN.

EXAMINER Steve Wollum LEVEL II DATE 9-18-93
9.16.93

RECV 1.6.92 Y.Y.

2HBR-91-006

Form 244

R0595

10 2090
12040

CP&L

Carolina Power & Light Company

HBR 91 011535 0

JAN 11 1991

Company Correspondence

File: R9X-XXX-CA-A528

NED-R-5225

MEMORANDUM TO: Mr. Marvin F. Page

FROM: R. M. Parsons

SUBJECT: Future Inservice Inspection Requirements for the H. B. Robinson Safety Injection Accumulator Nozzle Couplings

On September 14, 1990, hydrostatic testing of the Safety Injection accumulators revealed a leak in one of the stainless steel Level Transmitter nozzle couplings in the "C" Accumulator (nozzle C-3 on attached sketches). The Nuclear Engineering Department (NED) was requested to coordinate the root cause evaluation for this leaking coupling and to provide technical support for the necessary repairs (reference RET RNP-90-140).

The results of the subsequent investigation indicated that the coupling was leaking due to intergrannular stress corrosion cracking (IGSCC). IGSCC can only initiate when the following three conditions exist simultaneously: tensile stresses, sensitized base material, and a corrosive environment. According to Code data package records, each of the accumulator couplings was manufactured from a low carbon ("L") grade of stainless steel (i.e., SA 182 F304L with 0.035% max. reported carbon content). However, the failure analysis results on nozzle C-3 indicated that this coupling was manufactured from standard grade stainless steel material. It was also determined that this coupling had been furnace sensitized from the post weld heat treatment (PWHT) conducted by the tank manufacturer (Delta Southern Corp.). It should be noted that "L" grade stainless steels are less susceptible to sensitization than the standard grades which allow 0.08% max. reported carbon content.

Evaluation of the remaining 26 nozzles within the three (3) accumulators - including carbon analyses, liquid penetrant (PT), and ultrasonic (UT) testing - revealed one additional cracked nozzle coupling (A-4 on attached sketches). Nozzle couplings C-3 and A-4 were replaced during the current outage, Refueling No. 13. In addition to the two (2) cracked couplings (C-3 and A-4), carbon analysis results indicated that Delta Southern had installed eleven (11) other standard grade stainless steel couplings into the tanks (A-1, A-2, A-6, A-7, B-1, B-2, B-3, B-4, B-5, C-1, C-7). These eleven couplings are considered to be furnace sensitized and are therefore susceptible to IGSCC.

RFO 14 SCOPE →

Page 1 of 6

JAN 1 1 1991

Since these sensitized couplings are considered susceptible to future IGSCC, the following options were considered:

1) **Replacement of the Sensitized Couplings Using 'L' Grade Material During Future Outages.** Using the 'L' grade stainless steel materials with no required PWHT, these new couplings should not be susceptible to IGSCC. Future augmented inservice inspections of these couplings would not be required. Welding procedure specifications, engineering evaluations that implement the ASME Section XI repair program, and special procedures would be available to support future replacement activities. Pre-outage planning and preparation work could minimize the impact of such replacement activities on the outage schedule (e.g., machining of new couplings, mock-up welding, etc.).

   If time constraints prevented the replacement of all the sensitized couplings during the outage, efforts could be directed towards replacing those with the highest carbon contents first (see reported carbon contents on the attached sketches). Couplings which are not replaced would require augmented inservice inspection, as discussed below.

2) **Inspection of each Sensitized Coupling During Future Refueling Outages and Replace Those Determined to be Cracked.** Inspection would include as a minimum the same techniques used during the current outage to examine (e.g., UT, PT) that portion of each coupling accessible from the tank outside diameter (OD) surface. UT reference/calibration standards, developed during the current outage, would be available from the Metallurgical Services Section (MSS) NDE Unit. Coordination with the MSS NDE Unit might permit further refinement of these inspection techniques to allow improved detection of cracks. One example of this refinement might be the use of a water sensitive PT dye to permit the OD inspection of lower couplings without draining the tanks.

   If no additional cracks were detected during the next two (2) refueling cycles, it would be proposed that the UT/PT inspection frequency be reduced to every second subsequent refueling outage. This frequency would continue for an additional two inspections over the course of four refueling cycles. Provided no other cracks were detected, the UT/PT inspections would then be dropped and future inspection would be limited to the Code required 10-year hydrostatic test.

JAN 1 1 1991

After careful consideration of both options, NED has chosen to recommend the second which would have the remaining couplings inspected in future years. During this period of time, if cracks were detected in any of the remaining eleven couplings, further consideration could be given to reverting back to the first option. NED should be notified if further engineering support is needed.

If there are any questions or need for further discussion, please contact me at (919)546-6351 or Ray Hanford at (919)546-7003.

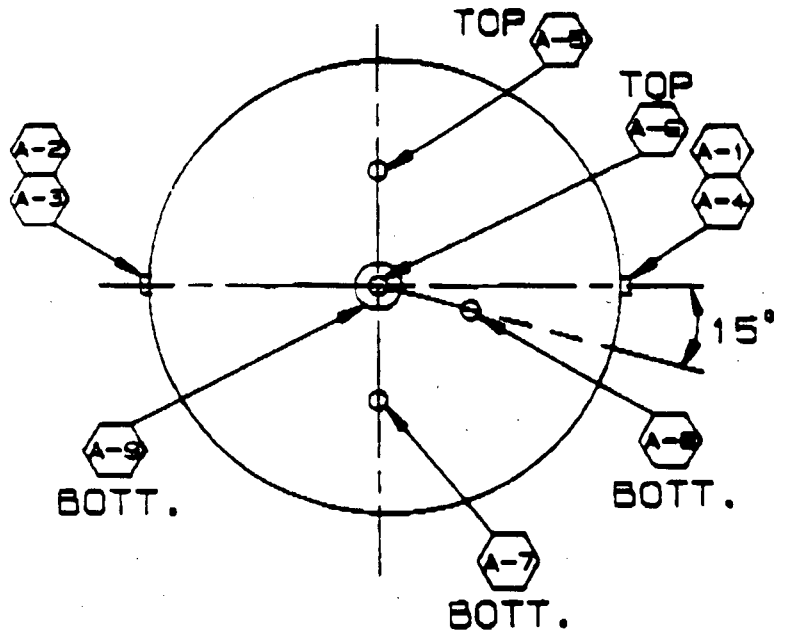
ORIGINAL SIGNED BY
R. M. PARSONS

CHG/jal

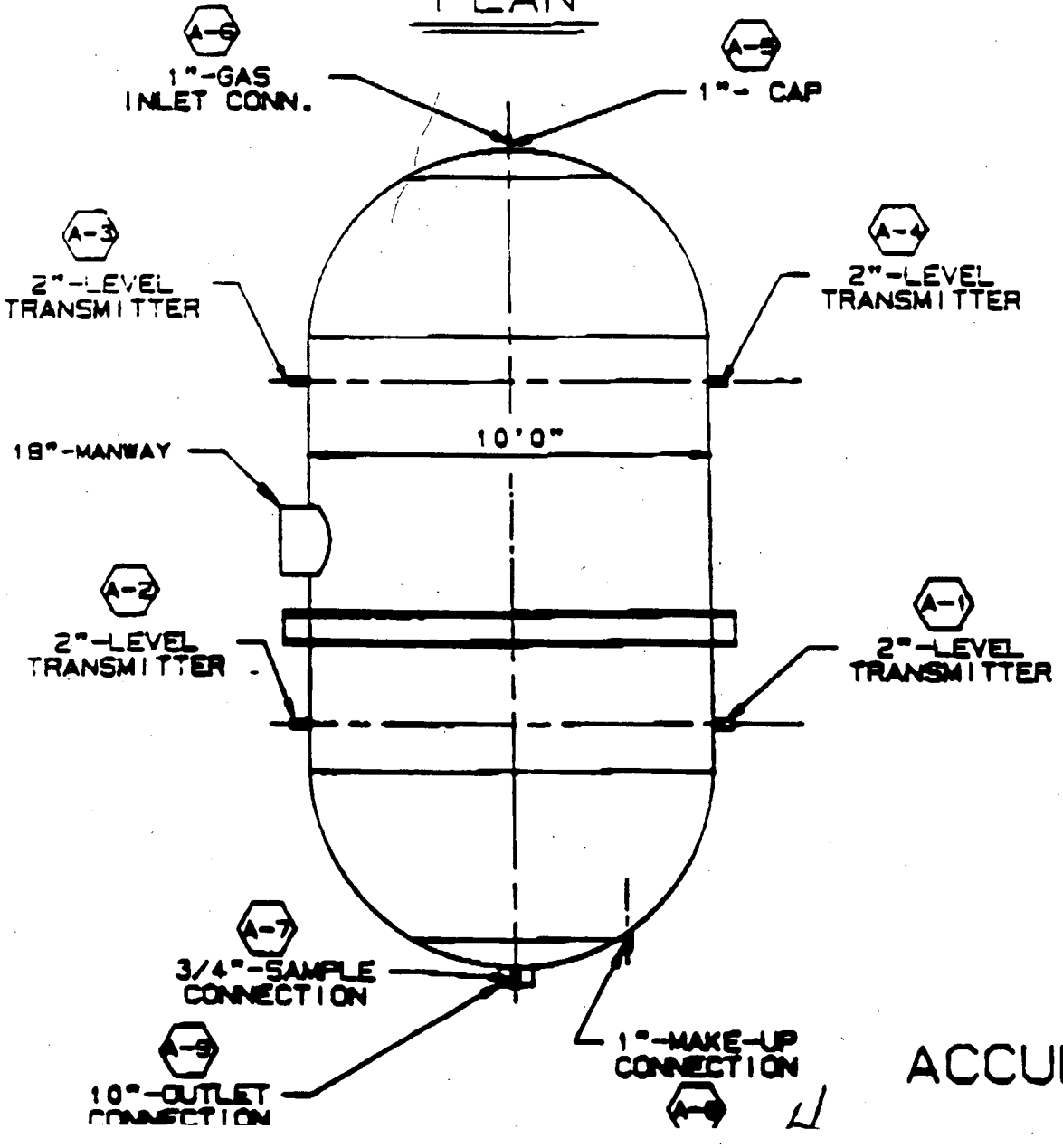
Attachments

cc: Mr. W. M. Biggs
Mr. G. K. Chappell
Mr. R. Hanford
Mr. A. M. Lucas
Mr. C. Osman

Carbon	Contents
A-1	.070%
A-2	.072%
A-6	.044%
A-7	.040%

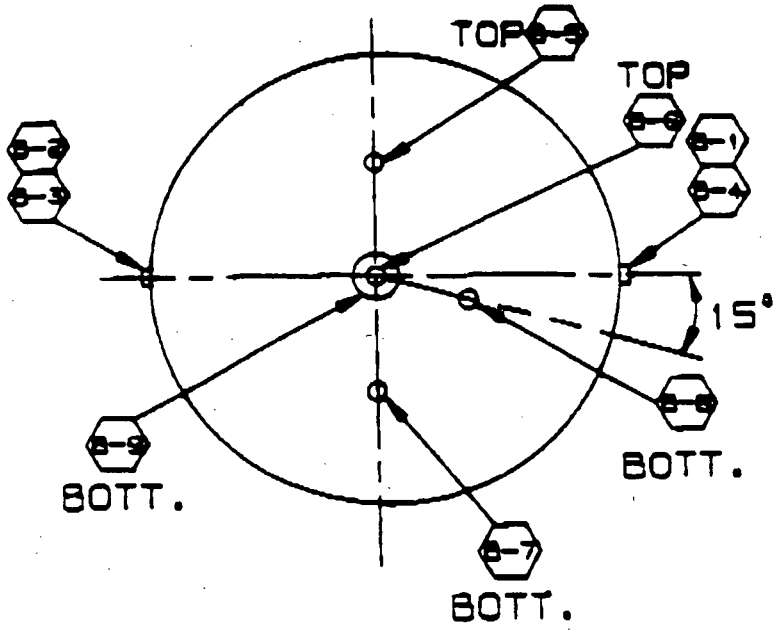


PLAN

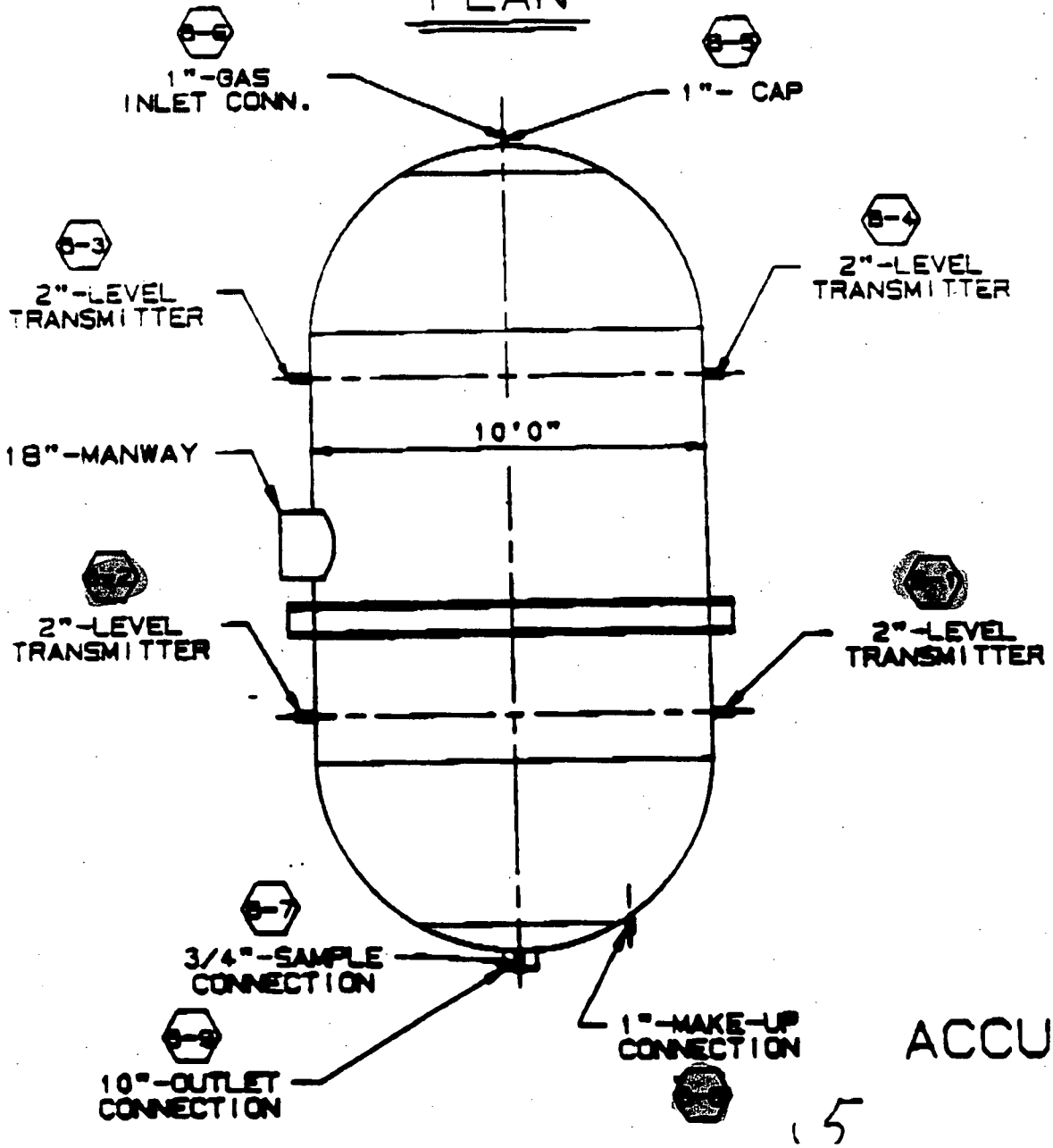


ACCUMULATO
A

Carbon	Contents
B-1	.044%
B-2	.095%
B-3	.072%
B-4	.068%
B-6	.042%

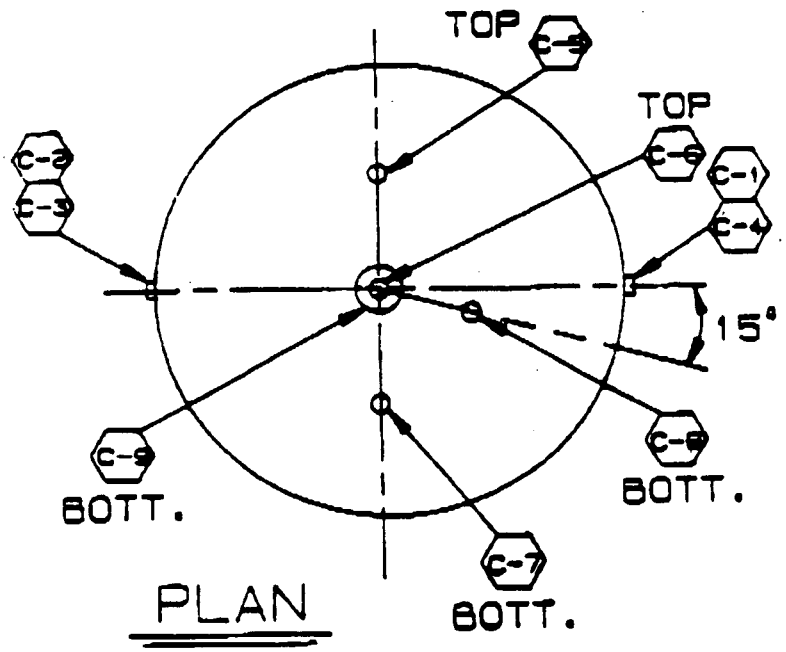


PLAN

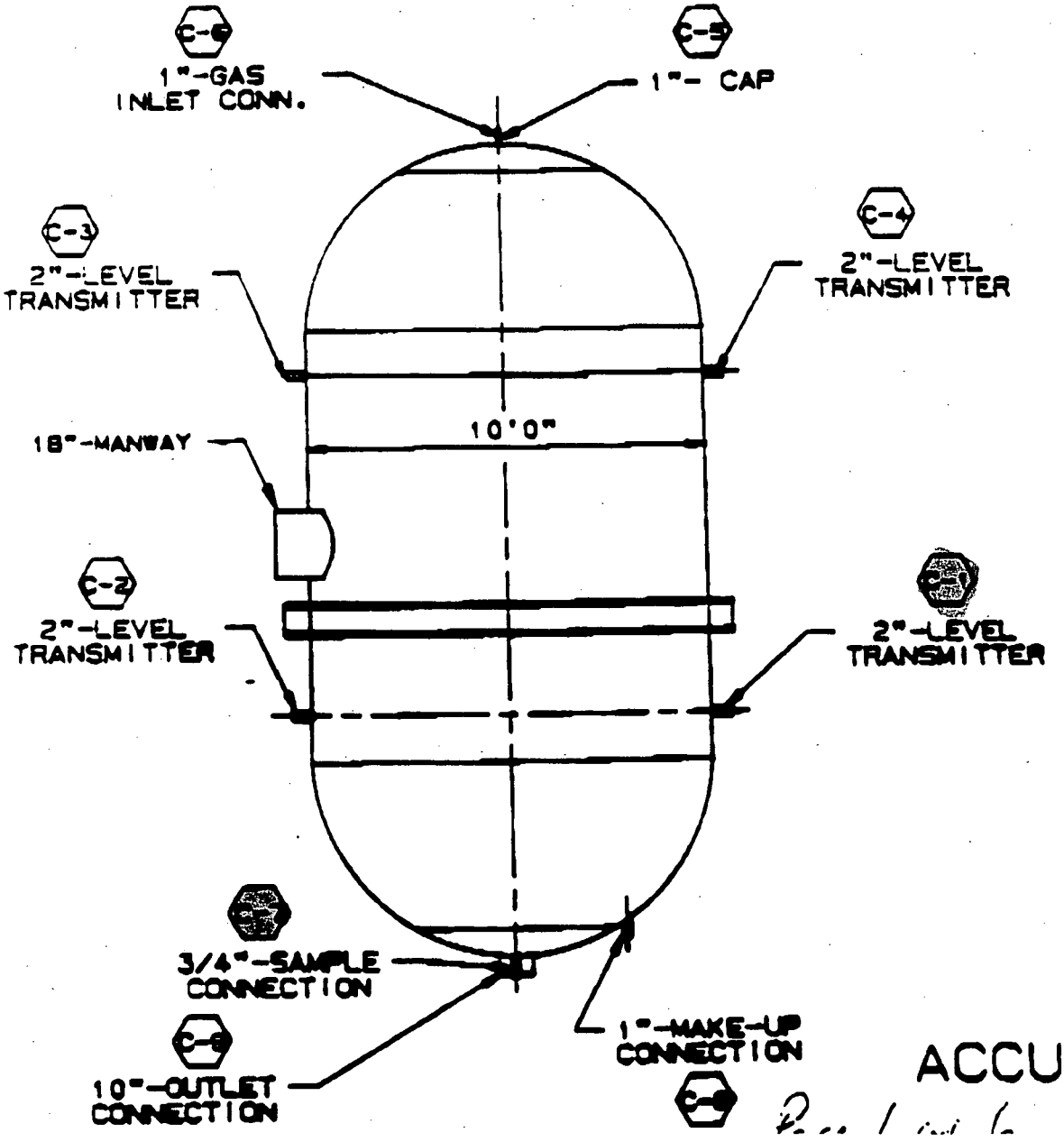


ACCUMULATO
B

Carbon	Contents
C-1	.038%
C-7	.049%



PLAN



ACCUMULATO

C

DATA SHEET NO. 1217-001
THERMOMETER S/N MR92-03
TEMPERATURE 85 ° F
NOMINAL THICKNESS .125"+.175" INCHES
MATERIAL S/S
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOW PRESSURE SAFETY INJECTION ISO/DWG/SK. # ACCUMULATOR A REVISION N/A
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93EDIK	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
A-1 2" LEVEL TRANSMITTER	NO RECORDABLE INDICATIONS	X	N/A
A-2 2" LEVEL TRANSMITTER	NO RECORDABLE INDICATIONS	X	N/A
A-7 3/4" SAMPLE CONNECTION	NO RECORDABLE INDICATIONS	X	N/A
	N/A		

EXAMINER Steve Wallum LEVEL II DATE 9-18-93
EXAMINER [signature] LEVEL I DATE 9-18-93
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 9/21/93
REVIEWER [signature] DATE ANII 9.21.93

DATA SHEET NO. 1217-003
THERMOMETER S/N MR92-03
TEMPERATURE 85 ° F
NOMINAL THICKNESS .1" INCHES
MATERIAL S/S
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 23
for 10-13-93

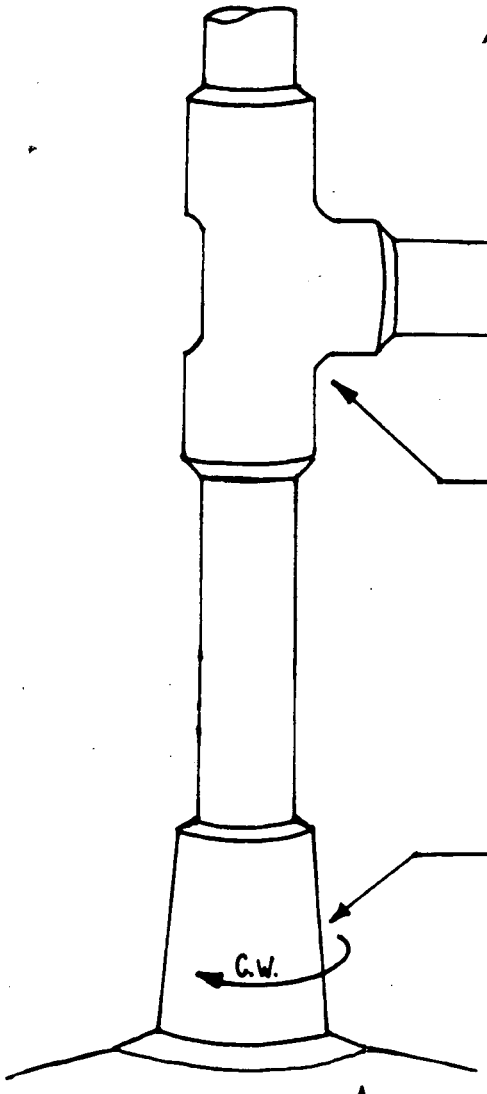
SYSTEM EXAMINED LOW PRESSURE SAFETY INJECTION ISO/DWG/SK. # ACCUMULATOR A REVISION N/A
DATUM POINT REFERENCE IN LINE WITH INSIDE RADIUS OF TEE ABOVE

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
A-6 1"-GAS INLET CONN.	LINEAR INDICATIONS (SEE ATTACHED SKETCH)	N/A	X
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 9-18-93
EXAMINER [signature] LEVEL I DATE 9-18-93
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER [signature] DATE 9/21/93
REVIEWER [signature] DATE ANII 9/21/93

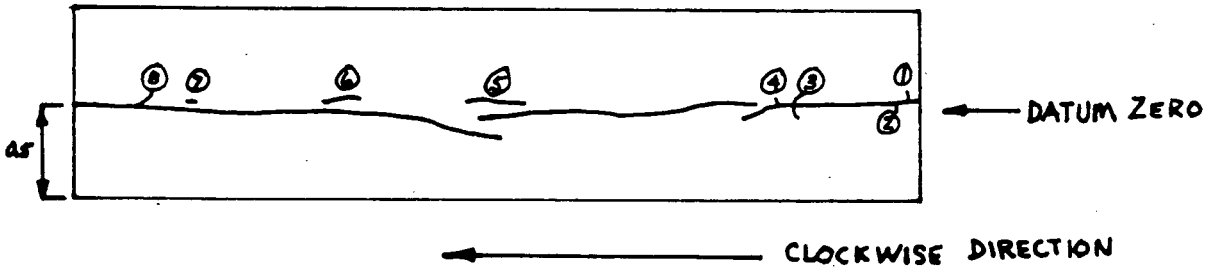
ACCUMULATOR A
1" GAS INLET CONN.



ACCUMULATOR A

- NOTE -

DATUM ZERO IN LINE WITH INSIDE RADIUS OF TEE ABOVE



1. 0.050
2. 0.050
3. 0.100
4. 0.050
5. 0.400
6. 0.250
7. 0.050
8. 0.100

INTERMITTEN LINEAR INDICATION 360° AROUND THE CIRCUMFERENCE OF INLET CONN.

EXAMINER Steve Wollum LEVEL II DATE 9-18-93

EXAMINER [illegible] LEVEL I DATE 9-18-93

SL 10-13-93
3

DATA SHEET NO. 1217-003
THERMOMETER S/N JL91-03
TEMPERATURE 83 ° F
NOMINAL THICKNESS 0.1 INCHES
MATERIAL 5/5
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 23 OF 43
SA 10-13-93

SYSTEM EXAMINED LOW PESSURE SAFETY INJECTION ISO/DWG/SK. # ACCUMULATOR A REVISION N/A
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
A-6 1" GAS INLET	RE EXAMINED AFTER REWORK	X	N/A
	N/A		

EXAMINER Steve Wollum LEVEL II DATE 9-21-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-21-93
REVIEWER Scott Moore LEVEL III DATE 10-13-93
REVIEWER _____ DATE _____
REVIEWER _____ DATE _____

DATA SHEET NO. 1217-034
THERMOMETER S/N JL91-03
TEMPERATURE 76 ° F
NOMINAL THICKNESS .344 2"INCHES .250" 1"
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED Accumulator B ISO/DWG/SK. # Accumulator B REVISION N/A
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	20 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld, B1	No Recordable Indications	X	N/A
Weld, B2	No Recordable Indications	X	N/A
Weld, B6	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd/Chris D. Judd LEVEL II DATE 10-3-93
EXAMINER [signature] LEVEL I DATE 10-3-93
REVIEWER [signature] LEVEL III DATE 10-4-93
REVIEWER [signature] DATE 10/5/93
REVIEWER [signature] DATE 10/5/93

DATA SHEET NO. 1217-002
THERMOMETER S/N MA92-03
TEMPERATURE 84° ° F
NOMINAL THICKNESS .175" INCHES
MATERIAL S/S
CLASS 2

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 1

SYSTEM EXAMINED LOW PRESSURE SAFETY INJECTION ISO/DWG/SK. # ACCUMULATOR B REVISION N/A
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
B-3 2" LEVEL TRANSMITTER	NO RECORDABLE INDICATIONS	X	N/A
B-4 2" LEVEL TRANSMITTER	NO RECORDABLE INDICATIONS	X	N/A
	N A		

EXAMINER Steve Wollum LEVEL II DATE 9-18-93
EXAMINER [signature] LEVEL I DATE 9-18-93
REVIEWER [signature] LEVEL III DATE 9-18-93
REVIEWER Richard B. Weber DATE 9/21/93
REVIEWER R P Wallace ANII DATE 9-21-93

DATA SHEET NO. 1217-035
THERMOMETER S/N JL91-03
TEMPERATURE 81 ° F
NOMINAL THICKNESS .344,2" INCHES 3/4", .219
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE _____ OF _____

SYSTEM EXAMINED Accumulator C ISO/DWG/SK. # Accumulator C REVISION N/A
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME	
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5	MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20	MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5	MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10	MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld C1	No Recordable Indications	X	N/A
Weld C7	No Recordable Indications	X	N/A
	N/A		

EXAMINER Chris D. Judd / Chris D. Judd LEVEL II DATE 10-3-93
EXAMINER Benjamin Sanders LEVEL I DATE 10-3-93
REVIEWER Scott Lane LEVEL III DATE 10-4-93
REVIEWER Richard B. Weber DATE 10/5/93
REVIEWER Anil C. Valladares DATE 10/5/93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-001
Page 1 of 4

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: UDEP-428 Rev.: 0 Couplant Brand: ULTRAGEL II

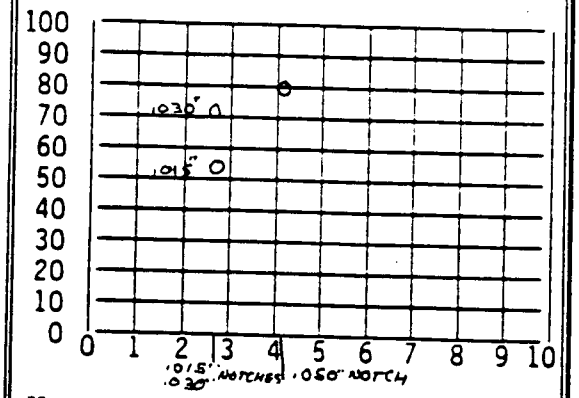
Instrument Mfg.: KRAUTKRAMER Model: USK-7 S/N: 27276-807

Search Unit Mfg.: AEROTECH Size: .25" Freq.: 5 mhz Angle/Mode: 45°/SHEAR S/N: K08505 Single/Dual

Cable Type: RG-174/U Length: 6' Connectors: BNC/mo Wedge Index to Front Meas.: .3"

Basic Block S/N: HBR-ACCUM-1 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.125"

Instrument Settings

DAC Construction

Gain - Axial Scan N/A dB
Gain - Circ. Scan 38 dB

Freq. BB
Range .5"
Sweep 9.51
Delay 7.63
Filter FIXED

Sensitivity

Gain - Axial Scan N/A dB
Gain - Circ. Scan 38 dB

Rep Rate FIXED
Resolution RESL
Damping FIXED
Reject OFF

Jack ☒ R ☐ T

Welds Examined	Calibration Verification		
A2, B3, B4	Initial Calibration Time	1330	Verification Times: N / A
	Final Verification Time	1515	

Comments

N/A

Examiner: [signature] Level: III Date: 9/29/93

Examiner: Daniel M Mantz Level: II Date: 9/29/93

Reviewed: Scott Lamm Level: III Date: 10/1/93

CPL-UT-13, Rev. 1 Richard O. Weber 10/2/93 ANII Abdallah 10/5/93

FORM NO. 8754.6
REV. 9/86

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 9/29/93

DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "A" (10/1/93 A...)	N/A	A-2

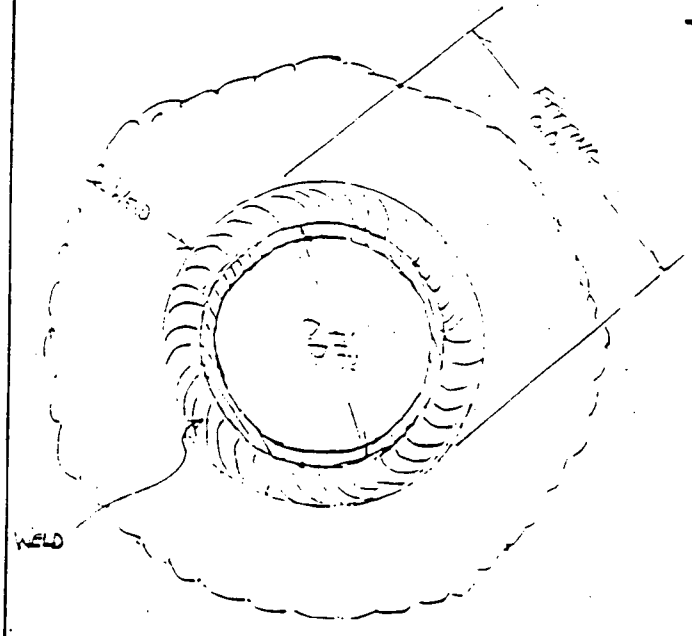
REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2
ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID "A" NOZZLE FITTING ID A-2

EXAMINATION PROCEDURE NDEP-428 REV 0

No Indications Noted.

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER [signature] LEVEL III EXAM DATE 9/29/93
EXAMINER David G Martin LEVEL II REPORT DATE
Richard B. Weber 10/2/93 ANII [signature] 10/5/93

FORM NO. 80516
REV. 9/86

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 9/29/93

DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "B"	N/A	B-3

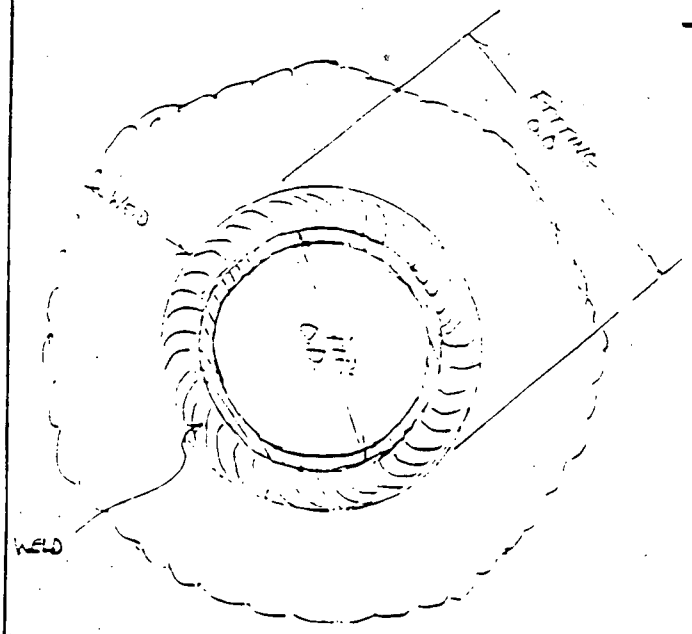
REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID "B" NOZZLE FITTING ID B-3

EXAMINATION PROCEDURE NDEP-428 REV 0

No Indications Noted

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER [signature] LEVEL III EXAM DATE 9/29/93
EXAMINER David M Martin LEVEL II REPORT DATE
Richard C Selver 10/2/93 ANII RP Balladares

FORM NO. 80516
REV. 9/86

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 9/29/93

DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "B"	N/A	B-4

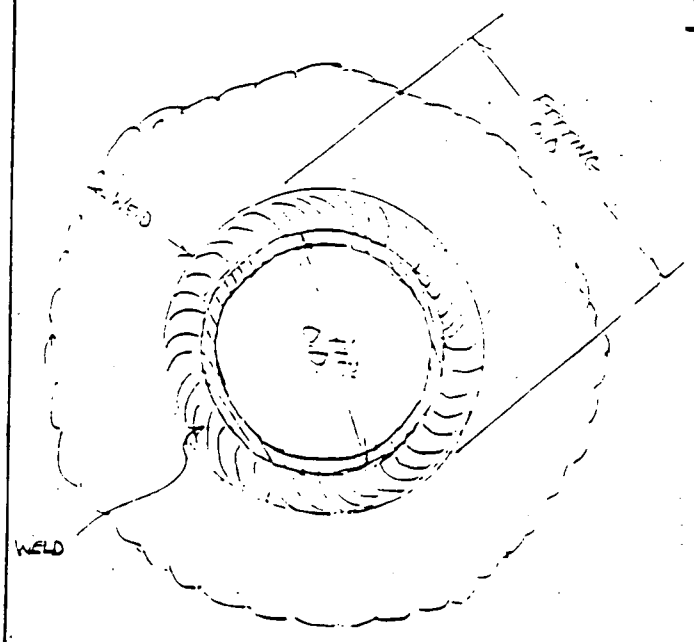
REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID "B" NOZZLE FITTING ID B-4

EXAMINATION PROCEDURE NDEP-428 REV 0

No Indications Noted.

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER [signature] LEVEL III EXAM DATE 9/29/93

EXAMINER David M Martin LEVEL II REPORT DATE

Richard B. Wilson 10/5/93

ANII Reviewed dates

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-002
Page 1 of 2

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: NDEP 428 Rev.: 0 Couplant Brand: Ultragel II

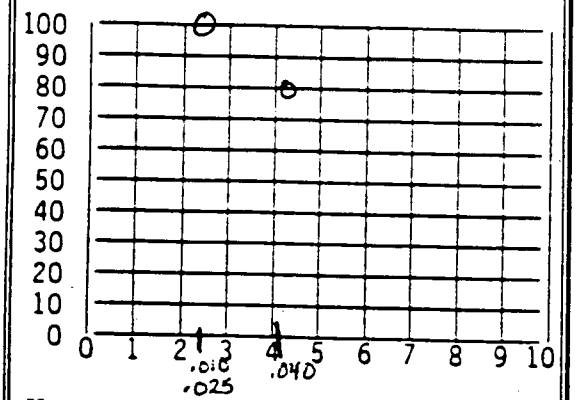
Instrument Mfg.: Krautkramer Model: USK-7 S/N: 27276-749

Search Unit Mfg.: Aerotech Size: .25" Freq.: 5MHz Angle/Mode: 45° Shear S/N: F11506 (Single)/Dual

Cable Type: RG174/U Length: 6' Connectors: BNC/MDT Wedge Index to Front Meas.: .3"

Basic Block S/N: HBR ACCUM 2 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.0"

Instrument Settings

DAC Construction

Gain - Axial Scan N/A dB
Gain - Circ. Scan 52 dB

Freq. BB
Range .5"
Sweep 8.74
Delay 7.46
Filter Fixed

Sensitivity

Gain - Axial Scan N/A dB
Gain - Circ. Scan 52 dB

Rep Rate Fixed
Resolution RESL
Damping Fixed
Reject OFF

Jack ☒ R ☐ T

Welds Examined	Calibration Verification			
A6			Verification Times	
	Initial Calibration Time	1110	1330	N/A
	Final Verification Time	1515	N/A	N/A
			N/A	N/A

Comments

N/A

Examiner: [signature] Level: III Date: 9/29/93

Examiner: David M Martin Level: II Date: 9/29/93

Reviewed: Scott Lamm Level: III Date: 10/1/93

CPL-UT-13, Rev. 1 Richard B. Weber 10/2/93 ANII R Wallace 10/5/93

FORM NO. 80516
REV. 9/86

CP&L
Carolina Power & Light Company
NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 9/29/93

DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "A"	N/A	A-6

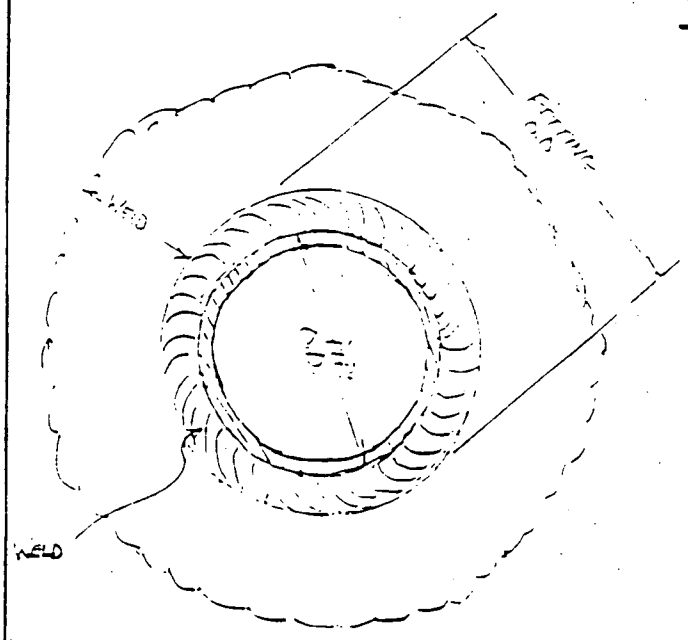
REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID A NOZZLE FITTING ID A6

EXAMINATION PROCEDURE NDEP 428 REV 0

No Indications Noted.

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER [signature] LEVEL III
EXAMINER David M Martin LEVEL II
Richard B. Weber 10/2/93

EXAM DATE 9/29/93 REPORT DATE

ANII A Valladares 10/5/93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-004
Page 1 of 4

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: NDEP-428 Rev.: 0 Couplant Brand: ULTRAGEL II

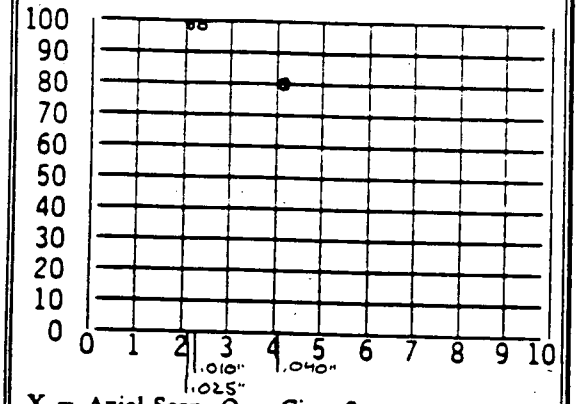
Instrument Mfg.: KRAUTKRAMER Model: USK-7 S/N: 27276-4172

Search Unit Mfg.: AREOTECH Size: .25" Freq.: 5.0 Angle/Mode: 45°/S S/N: F11506 Single/Du

Cable Type: RG-174/U Length: 6' Connectors: BNC/MD Wedge Index to Front Meas.: .3"

Basic Block S/N: HBR ACCUM-2 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.025"

Instrument Settings

DAC Construction

Gain - Axial Scan N/A dB
Gain - Circ. Scan 50 dB

Freq. FIXED
Range .5"
Sweep 8.10
Delay 7.36
Filter FIXED

Sensitivity

Gain - Axial Scan N/A dB
Gain - Circ. Scan 56 dB

Rep Rate FIXED
Resolution RESL.
Damping FIXED
Reject OFF

Jack ☑ R ☐ T

Welds Examined	Calibration Verification		
B-6 Initial Exam	Initial Calibration Time	1420	Verification Times
	Final Verification Time	1815	N/A

Comments .025" NOTCH = 100% FSH +8 dB
.010" NOTCH = 100% FSH +2 dB

Examiner: David M Martin Level: II Date: 10/4/93

Examiner: Tim Oddy Level: II Date: 10/4/93

Reviewed: Scott Lam Level: III Date: 10/6/93

CPL-UT-13, Rev. 1

Richard B. Usher N/A 10/12/93
ANN RP Valladares 10-13-93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-004
Page 2 of 4

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: NDEP-428 Rev.: 0 Couplant Brand: ULTRAGEL II

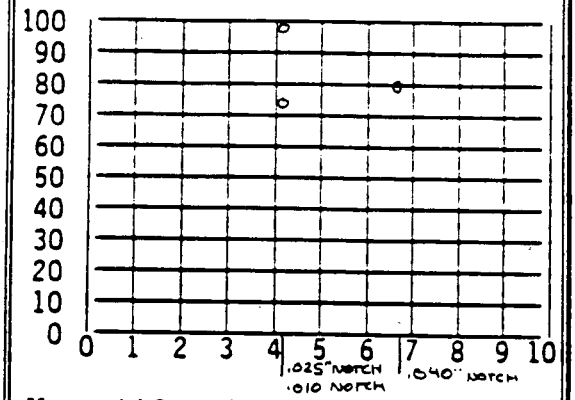
Instrument Mfg.: KRAUTKRAMER Model: USK-7 S/N: 27276-749

Search Unit Mfg.: AEROTECH Size: .125" Freq.: 5.0 Angle/Mode: 60°/S S/N: K18909 Single/Dual

Cable Type: RG-174/U Length: 6' Connectors: BNC/MD Wedge Index to Front Meas.: .3"

Basic Block S/N: HBR ACCUM-2 IIW S/N: 86-3254 Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.00"

Instrument Settings

DAC Construction		Sensitivity	
Gain - Axial Scan	N/A dB	Gain - Axial Scan	N/A dB
Gain - Circ. Scan	48 dB	Gain - Circ. Scan	54 dB
Freq.	FIXED	Rep Rate	FIXED
Range	.5"	Resolution	RESL.
Sweep	7.84	Damping	FIXED
Delay	7.40	Reject	OFF
Filter	FIXED		

Jack ☒ R ☐ T

Welds Examined	Calibration Verification		
B-6	Initial Calibration Time	0800	Verification Time: N/A
	Final Verification Time	1040	

Comments: SUPPLEMENTAL EXAM. VERIFIED RESULTS OF 45° EXAM.

Examiner: [signature] Level: II Date: 10/5/93

Examiner: [signature] Level: II Date: 10/5/93

Reviewed: [signature] Level: III Date: 10/6/93

CPL-UT-13, Rev. 1 Richard B. Weber N/A 10/12/93
Wallace AN II 10/13/93

FORM NO. 80516
REV. 9/86

CP&L
Carolina Power & Light Company
NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 10/4/93

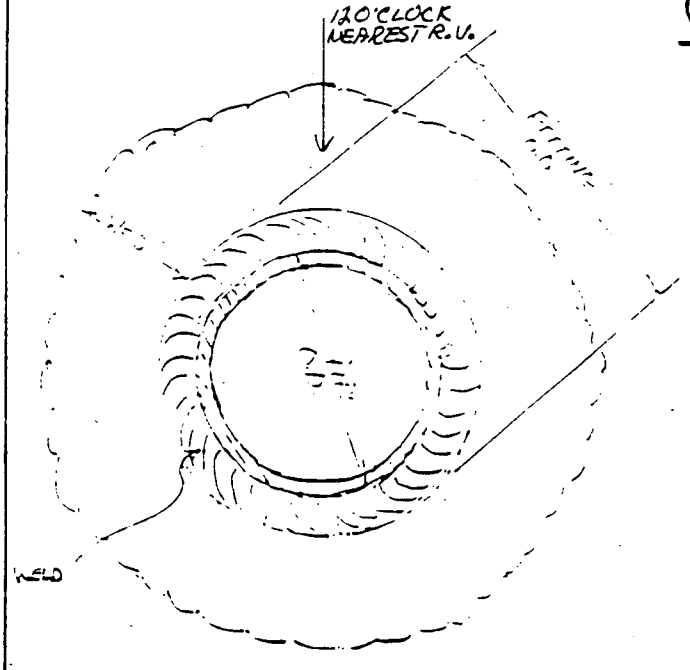
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "B"	N/A	B6

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID B NOZZLE FITTING ID B6

EXAMINATION PROCEDURE NDEP-428 REV 0

TOP VIEW

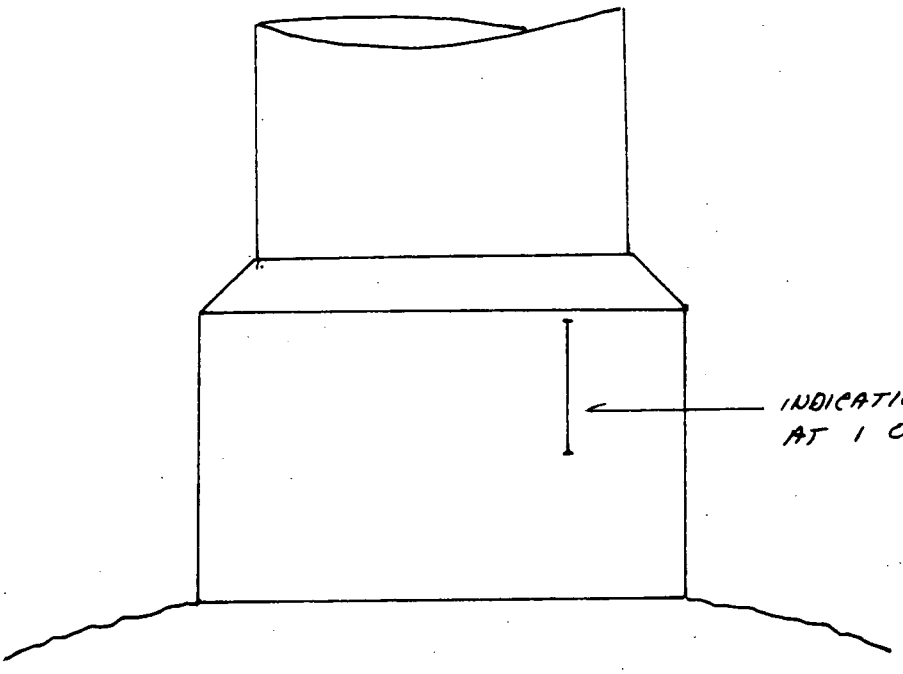


REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
10°CLOCK	100% DSC	4.0	CCW

EXAMINER David M Martin LEVEL II EXAM DATE 10/4/93 REPORT DATE _____
EXAMINER Tim Adelson LEVEL II
David B Weber N/A 10/12/93

ACCUMULATOR "B" NOZZLE B-6



David M Martin L. II 10/4/93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-005
Page 1 of 5

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: NDEP-428 Rev.: 0 Couplant Brand: ULTRAGEL II

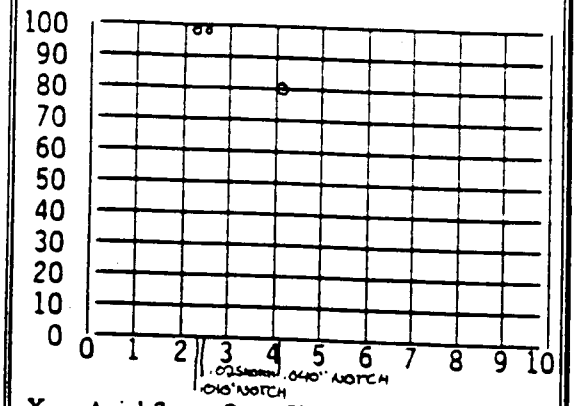
Instrument Mfg.: KRAUTKRAMER Model: USK-7 S/N: 27276-749

Search Unit Mfg.: AEROTECH Size: .25" Freq.: 5.0 Angle/Mode: 45°/~~SHEAR~~ S/N: K18909 (Single)/D

Cable Type: RG-174/U Length: 6' Connectors: BNC/MD Wedge Index to Front Meas.: .35

Basic Block S/N: HBR-ACCUM 2 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.025"

Instrument Settings

DAC Construction

Gain - Axial Scan N/A dB
Gain - Circ. Scan 48 dB

Freq. FIXED
Range 2.5
Sweep 0.95
Delay 7.50
Filter FIXED

Sensitivity

Gain - Axial Scan N/A dB
Gain - Circ. Scan 54 dB

Rep Rate FIXED
Resolution RESL.
Damping FIXED
Reject OFF

Jack ☒ R ☐ T

Welds Examined	Calibration Verification		
B-6 Reexamination see page 4 for additional information	Initial Calibration Time	1445	Verification Time
	Final Verification Time	1730	N/A

Comments .025" NOTCH = 100% FSH + 2 DB

Examiner: David M Martin Level: II Date: 10/8/93

Examiner: Steve Wollum Level: I Date: 10/8/93

Reviewed: Scott [illegible] Level: III Date: 10/12/93

Richard B. Walker N/A 10/12/93
M Wallendorf ANII 10/13/93

FORM NO. 80516
REV. 9/86

428-005

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

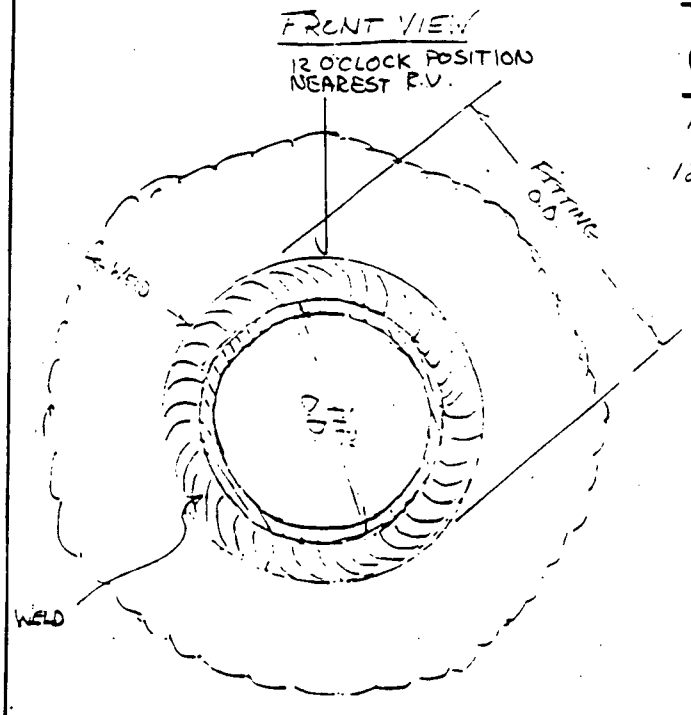
PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 10/8/93

DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "B"	N/A	B-6

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2
ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID "B" NOZZLE FITTING ID B-6

EXAMINATION PROCEDURE NDEP-428 REV 0



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
1 O'CLOCK	70%	.348" MP	CCW
12 O'CLOCK	10%	.379" MP	CW

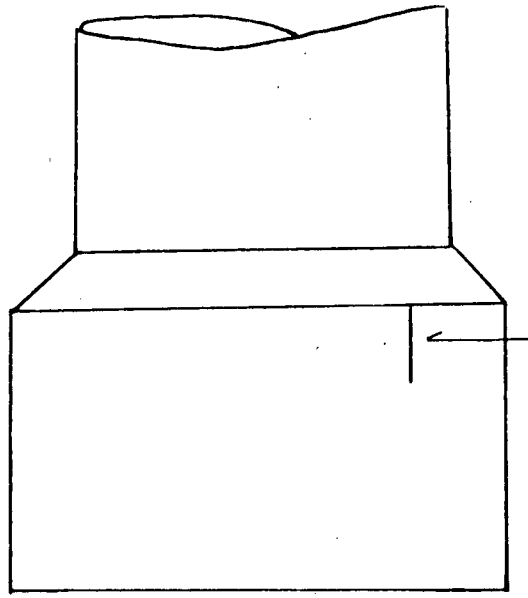
EXAMINER David M Martin LEVEL II EXAM DATE 10/8/93 REPORT DATE

EXAMINER Steve Wollum LEVEL I

Richard B. Weber N/A 10/12/93

ACCUMULATOR "B"
NOZZLE B-6

428-005
3 of 5



.4" LONG INDICATION AT 1 O'CLOCK POSITION. *

12 O'CLOCK POSITION NEAREST R.V.

* .25" CAL. BLOCK NOTCH LENGTH PRODUCES .4" INDICATION LENGTH.

David M Martin LEVEL II 10/8/93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-005
Page 4 of 5

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: NDEP-428 Rev.: 0 Couplant Brand: ULTRAGEL II

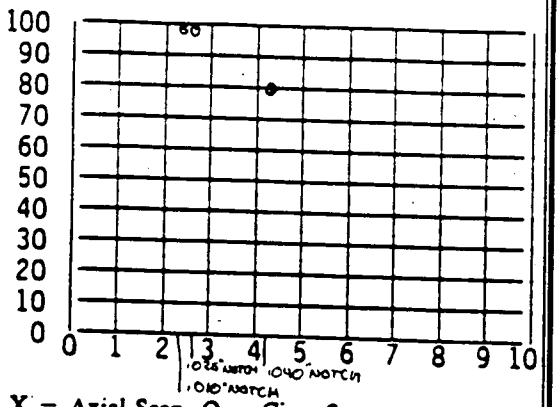
Instrument Mfg.: KRAUTKRAMER Model: USK-7 S/N: 31459-1499

Search Unit Mfg.: AEROTECH Size: .25" Freq.: 5.0 Angle/Mode: 45°/SHEAR S/N: NB909 Single/D

Cable Type: RG-174/U Length: 6' Connectors: BNC/MD Wedge Index to Front Meas.: .35"

Basic Block S/N: NBE ACCUM-2 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.025

Instrument Settings

DAC Construction		Sensitivity	
Gain - Axial Scan	N/A dB	Gain - Axial Scan	N/A dB
Gain - Circ. Scan	40 dB	Gain - Circ. Scan	50 dB
Freq.	FIXED	Rep Rate	FIXED
Range	2.5	Resolution	RESL.
Sweep	3.09	Damping	FIXED
Delay	9.99	Reject	OFF
Filter	FIXED		

Jack ☒ R ☐ T

Welds Examined	Calibration Verification		
B-6	Initial Calibration Time	0810	Verification Time
	Final Verification Time	1005	N/A

Comments .025" NOTCH = 100% FSH + 2 dB

Note: Re-examined after ID made Accessible

Examiner: David M Mantz Level: II Date: 10 / 11 / 93

Examiner: [signature] Level: III Date: 10 / 11 / 93

Reviewed: [signature] Level: III Date: 10 / 12 / 93

CPL-UT-13, Rev. 1

Richard B Weber Level: N/A Date: 10/12/93
Wallace Lane Level: ANII Date: 10/13/93

FORM NO. 80516
REV. 9/86

428-005

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HBR | JOB NO. N/A | UNIT 1☐ 2☒ 3☐ 4☐ | DATE 10/11/93

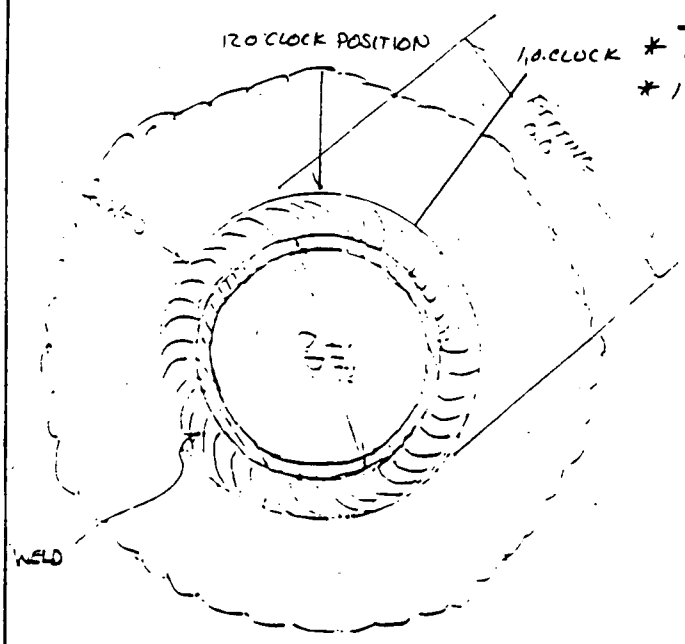
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "B"	N/A	B-6

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID "B" NOZZLE FITTING ID B-6

EXAMINATION PROCEDURE NDEP-428 REV 0

R.V. SIDE



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
* 10 CLOCK	70%	.350"	CCW
* 120 CLOCK	10%	.375"	CW

* INDICATION DAMPS FROM I.D.
Reexam after ID made Accessible

EXAMINER David H Martin LEVEL II EXAM DATE 10/11/93 REPORT DATE 10/11/93
EXAMINER [signature] LEVEL III
Richard B. Weber N/A 10/12/93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-002
Page 1 of 5

Plant: HB Robinson Unit: 2 Data Sheets:

Procedure No.: NDEP-428 Rev.: 0 Couplant Brand: Ultragel II Batch# 093050

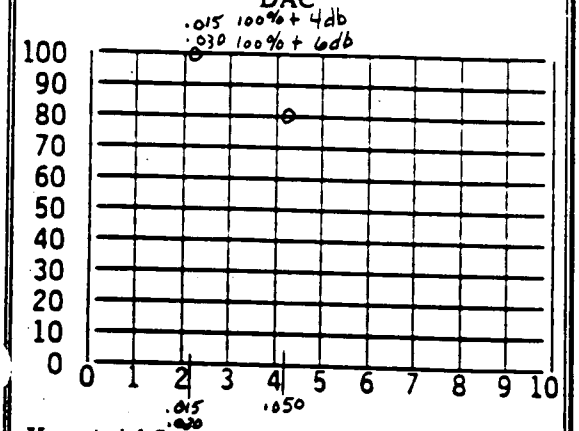
Instrument Mfg.: Krautkramer Branson Model: USK-7 S/N: 27276-3784

Search Unit Mfg.: Aeratech Size: .25" Freq.: 5.0 mHz Angle/Mode: 45°/Shear S/N: K08505 (Single)/Dual

Cable Type: RG-174/U Length: 6' Connectors: BNC to MDT Wedge Index to Front Meas.: .35"

Basic Block S/N: HBR-Accum-1 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 1.59"

Instrument Settings

DAC Construction

Gain - Axial Scan N/A dB
Gain - Circ. Scan 38 dB

Freq. Fixed
Range .5
Sweep 8.02
Delay 7.12
Filter N/A

Sensitivity

Gain - Axial Scan N/A dB
Gain - Circ. Scan 52 dB

Rep Rate Fixed
Resolution N/A
Damping Fixed
Reject Off

Jack N/A R ☒ T

Welds Examined	Calibration Verification		
Accumulator welds A-1, B-1, B-2, C-1		Verification Times	
N/A	Initial Calibration Time: 0758	1038	1247
	Final Verification Time: 1558	N/A	N/A

Comments

.050 Notch 4.2 DIV @ 80% 42 db
.030 Notch 2.2 DIV @ 100% + 6 db
.015 Notch 2.2 DIV @ 100% + 4 db

Examiner: Tim Addison Level: II Date: 10/5/93

Examiner: David M Martin Level: II Date: 10/5/93

Reviewed: Scott Lam Level: III Date: 10/6/93

CPL-UT-13, Rev. 1 Initial B. Weber 10/9/93

FORM NO. 80516
REV. 9/86

CP&L
Carolina Power & Light Company
NDE DRAWING ATTACHMENT

PROJECT HB Robinson JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE _____

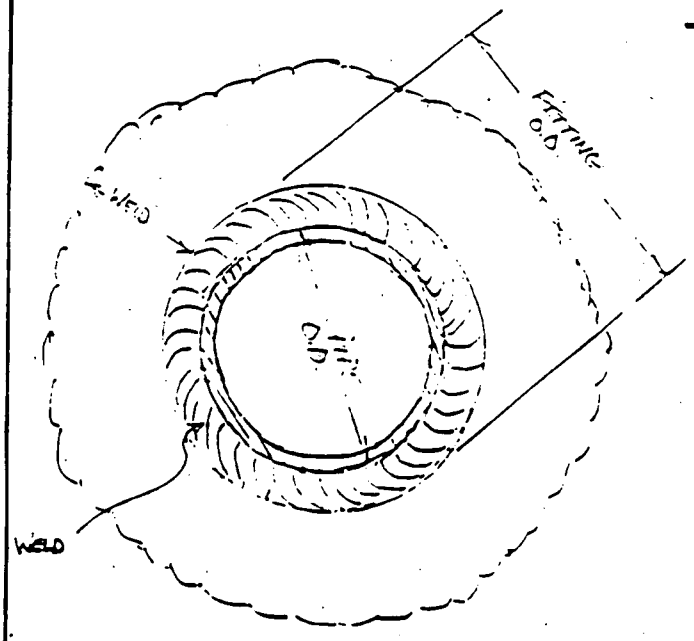
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	Accumulator	N/A	A-1

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID A NOZZLE FITTING ID A1

EXAMINATION PROCEDURE NDEP-428 REV 0

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER Tim Addam LEVEL II EXAM DATE 10-5-93
EXAMINER David M Martin LEVEL II REPORT DATE _____
Richard A. Weber 10/6/93

FORM NO. 80516
REV. 9/86

CP&L
Carolina Power & Light Company
NDE DRAWING ATTACHMENT

PROJECT HB Robinson JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE

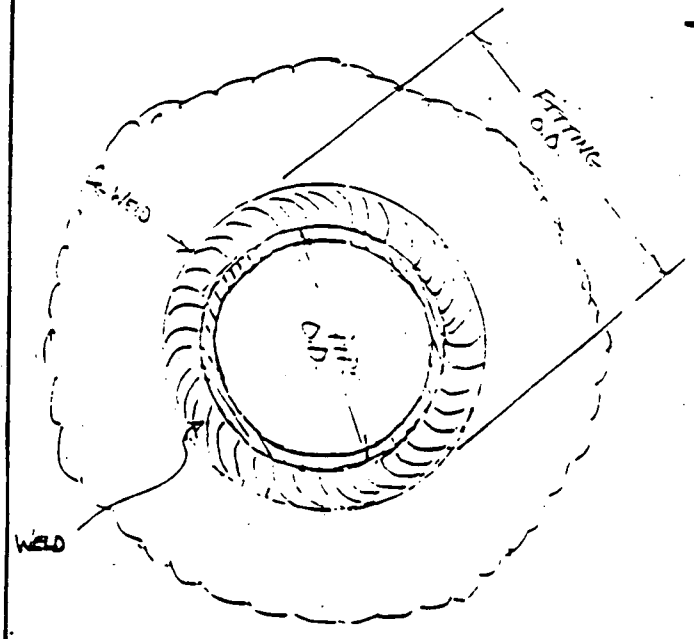
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	Accumulator	N/A	B-1

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID B NOZZLE FITTING ID B1

EXAMINATION PROCEDURE NDEP-428 REV 0

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER Tim Oldham LEVEL II EXAM DATE 10-5-93 REPORT DATE

EXAMINER David M Martin LEVEL II

Richard B. Weber 10/9/93

ULTRASONIC EXAMINATION OF NOZZLES ON HBR UNIT 2 ACCUMULATOR TANK

FORM NO. 80516
REV. 9/86

CP&L
Carolina Power & Light Company
NDE DRAWING ATTACHMENT

PROJECT HB Robinson JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE

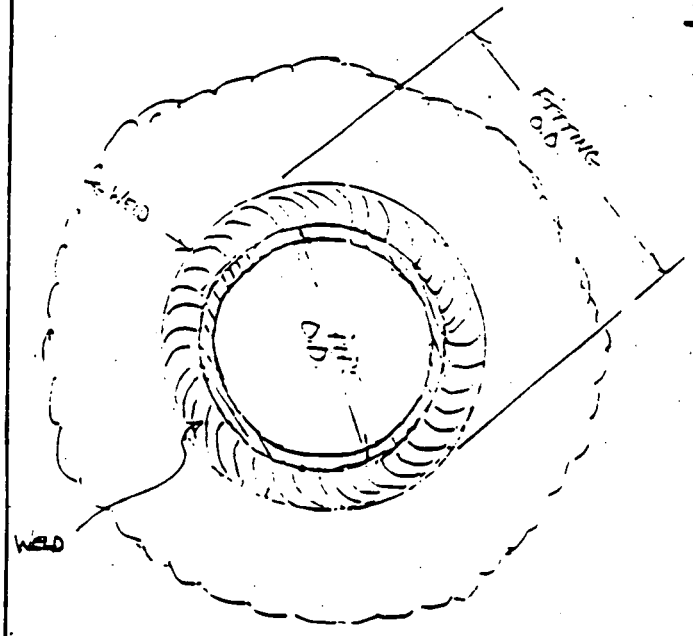
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	Accumulator	N/A	B-2

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2
ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID B NOZZLE FITTING ID B2

EXAMINATION PROCEDURE NDEP-428 REV 0

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER Jim Adams LEVEL II EXAM DATE 10-5-93
EXAMINER David G Martin LEVEL II REPORT DATE
Richard B. Webb 10/6/93

QA NDE CS 1 Rev. 0 6/83

FORM NO. 88516
REV. 9/86

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HB Robinson JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE

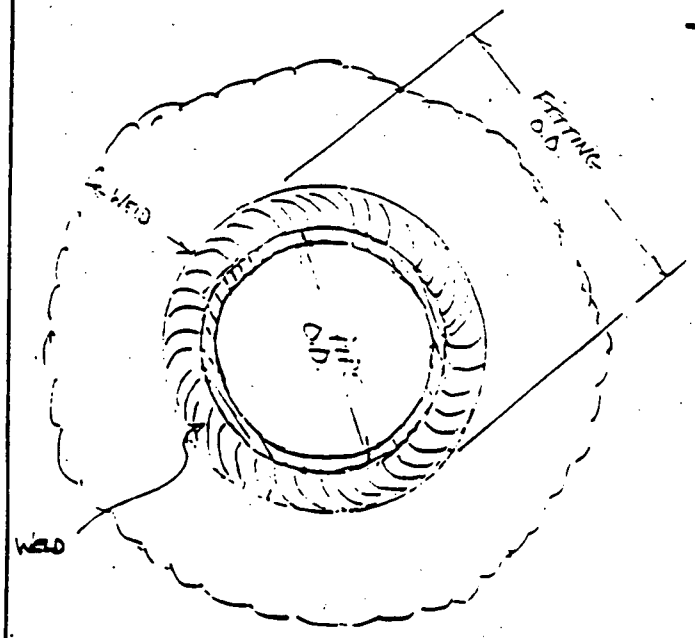
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	Accumulator	N/A	C-1

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID C NOZZLE FITTING ID C1

EXAMINATION PROCEDURE NDEP-428 REV 0

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER Tim Addison LEVEL II EXAM DATE 10-5-93

EXAMINER David G Mantz LEVEL II REPORT DATE

Richard B. Weber 10/9/93

CAROLINA POWER & LIGHT COMPANY
ULTRASONIC CALIBRATION DATA SHEET

Cal. Sheet No. 428-003
Page 1 of 3

Plant: HBR Unit: 2 Data Sheets:

Procedure No.: NDEP-428 Rev.: 0 Couplant Brand: ULTRAGEL II

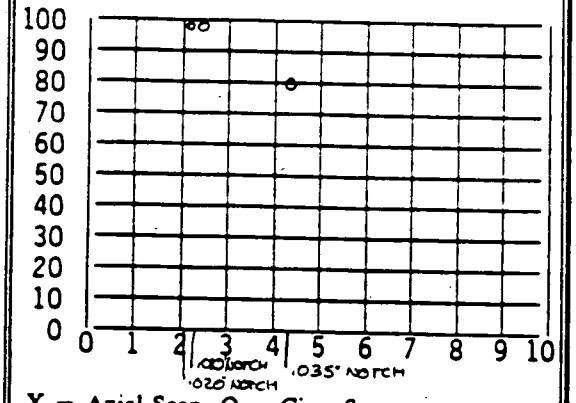
Instrument Mfg.: KRAUTKRAMER Model: USM-7 S/N: 27276-4172

Search Unit Mfg.: AEROTECH Size: .25" Freq.: 5.0 Angle/Mode: 45°/S S/N: ~~F11508~~ F11506 (Single) Dual

Cable Type: RG-174/U Length: 6' Connectors: BNC/MQ Wedge Index to Front Meas.: .3"

Basic Block S/N: HBRACCUM-3 IIW S/N: N/A Miniature Blk. S/N: N/A Others: N/A

DAC



X = Axial Scan, O = Circ. Scan
Scale Range: 0 - 10 = Metal Path 0.80"

Instrument Settings

DAC Construction

Gain - Axial Scan N/A dB
Gain - Circ. Scan 44 dB

Freq. FIXED
Range .5
Sweep 8.20
Delay 7.47
Filter FIXED

Sensitivity

Gain - Axial Scan N/A dB
Gain - Circ. Scan 50 dB

Rep Rate FIXED
Resolution RESL.
Damping FIXED
Reject OFF

Jack ☒ R ☐ T

Welds Examined	Calibration Verification			
A-7, C-7	Initial Calibration Time	0800	Verification Times 1030	1250
	Final Verification Time	1600		N/A

Comments .020" NOTCH = 100% FSH +6 dB

Examiner: David M Martin Level: II Date: 10/5/93

Examiner: Tim Gibson Level: II Date: 10/5/93

Reviewed: Scott Lan Level: IIC Date: 10/6/93

CPL-UT-13, Rev. 1 Richard D Weber 10/4/93 ANII R Palladares 10/11/93

FORM NO. 80516
REV. 9/86

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 10/5/93

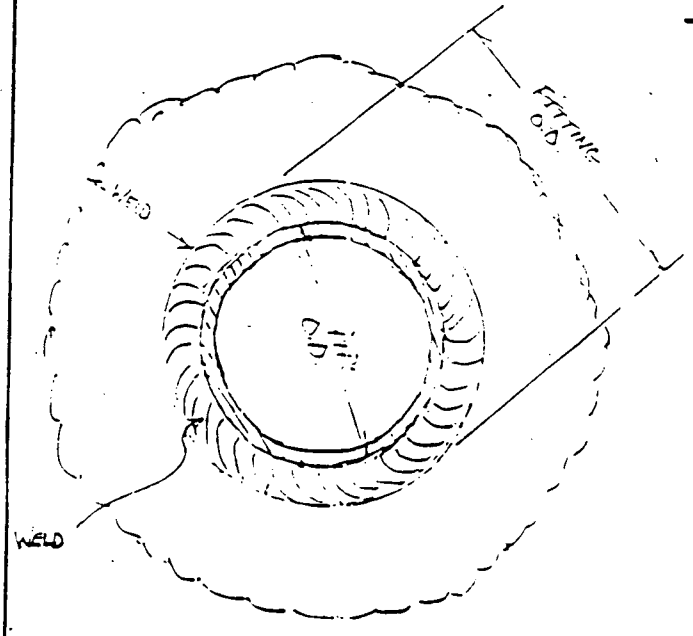
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "C"	N/A	C-7

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2
ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID "C" NOZZLE FITTING ID C-7

EXAMINATION PROCEDURE NDEP-428 REV 0

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER David M Master LEVEL II EXAM DATE 10/5/93 REPORT DATE

EXAMINER Tom Addison LEVEL II

Richard B. Weber 10/9/93

FORM NO. 80516
REV. 9/86

Carolina Power & Light Company

NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 10/5/93

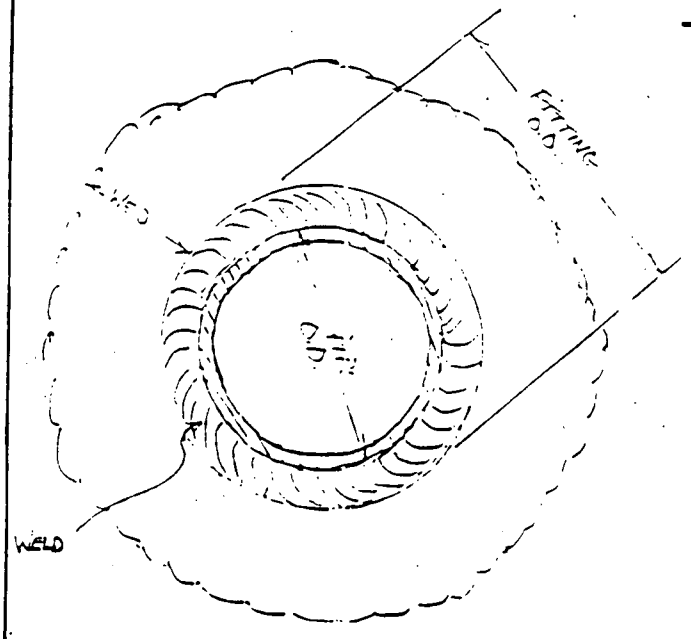
DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
N/A	ACCUMULATOR "A"	N/A	A-7

REPORT OF ULTRASONIC EXAMINATION OF H.B. ROBINSON, UNIT 2 ACCUMULATOR TANK NOZZLE FITTINGS

ACCUMULATOR TANK ID A NOZZLE FITTING ID A-7

EXAMINATION PROCEDURE NDEP-428 REV 0

FRONT VIEW



REFLECTORS

LOCATION (CLOCK POSITION)	AMPLITUDE	SWEEP POSITION	SCAN DIRECTION (CW or CCW)
N/A	N/A	N/A	N/A

EXAMINER Donald M Martin LEVEL II
EXAMINER Tim Oldham LEVEL II
Richard B. Weber 10/9/93

EXAM DATE 10/5/93 REPORT DATE

CP&L

To: Mr. Charles Griffin

From: Carl Osman

Date: January 11, 1994

Subject: H. B. Robinson RFO-15 Steam Generator Girth Weld Reexamination Results

Attached are two sets of Ultrasonic Examinations Indication Reporting forms for the six indications in Weld 5, Steam Generator "A". The forms annotated Preliminary reflect the evaluations and dimensions of the indications provided to us verbally by Yousuf Khan, Siemens, Level III, during the on-site discussion of preliminary examination report. Using these preliminary indication dimensions, we evaluated the indications against the "tolerable flaw diagrams" and concluded the indications were acceptable in accordance with ASME Section XI, IWB/IWC-3500.

The forms annotated Final show indication evaluation results based on the Siemen's Final Report which I received the third week in December.

There are some differences between the Preliminary and Final results for three of the indications. These differences are in the "favorable" direction and the three indications remain acceptable in accordance with IWB/IWC-3500 as we concluded when we evaluated them using the Preliminary report dimensions.

Specifically, the differences are:

P-Scan #3
Preliminary Report - Recordable Indication; L = 2.0", Thru-wall = .108"
Final Report - Recordable Indication; L = 1.574", Thru-wall = .108"

P-Scan #4
Preliminary Report - Recordable Indication; L = .625", Thru-wall = .22"
Final Report - Non-recordable Indication; L = N/A, Thru-wall = N/A

P-Scan #6
Preliminary Report - Recordable Indication; L = 1.57", Thru-wall = .108"
Final Report - Recordable Indication; L = .787", Thru-wall = .108"

I talked by telephone with Yousuf Khan about the P-Scan #4 indication change from Recordable to Non-recordable status. In the preliminary evaluation and reporting, the "dimensioning" was done at a level corresponding to the higher P-Scan system gain level used during scanning and data collection on the generator. When final evaluation of data was done at a level corresponding to Code-specified recording level for UT indications in vessel welds (50% DAC and greater), the maximum amplitude for Indication #4 did not reach equivalent 50% DAC level. Thus, the indication is Non-recordable.

I told Khan even though Indication #4 is evaluated/reported as non-recordable in RFO-15, it is likely we will still want to compare dimensions from RFO-14 and RFO-15 examinations to demonstrate our "no growth" conclusion. Thus, what dimensions should we use? Khan indicated we should use the Preliminary dimensions.

Concerning length change, Khan essentially reiterated the discussion we had during on-site preliminary report review. In that discussion, Khan indicated his conclusion that the difference in reported length and thru-wall dimensions were not the result of flaw growth but rather resulted from variations in the overall inspection process. He mentioned such variations as contact/scanning surface irregularities (e.g., pits, gouges) which can effect sound beam incident angle on the indication and signal amplitude, not being able to position the scanning fixture in the same exact locations as in RFO-14, the elevated temperature of the generator/scanning areas (100°F + vs. 70 - 80°F in RFO-14) and overall poorer working conditions inside the bioshield wall than in RFO-14. Of most signifance to the conclusion of no actual change in indication dimensions is that the echodynamic characteristics of the signals from the reflectors are not indicative of physical changes. As I commented in the on-site meeting, I agree with Khan's conclusions.

Results of NRC Inspector Crowley's review of our examination process, examination results and conclusions were "positive". As you remember, we showed him an informal tabular comparison of UT indication dimensions from RFO-14 and RFO-15 Preliminary and explained the various points of "evidence" we considered in reaching our conclusion that the indications have not changed in size. His verbal comments during our examination review meeting with him, his verbal comments during the exit meeting and the "words" in his written report of the site visit agree/support our conclusion of no change.

Conclusion and Recommendation

The results and report of the RFO-15, P-Scan reexamination conducted on selected locations of Weld 5, Steam Generator "A" indicate no significant dimensional changes for the six UT indications examined/sized. These "no change" results provide evidence for a reasonable conclusion that the UT indications are not caused by service related flaws.

It is recommended that subsequent examination activities for this Code class and category of weld be in accordance with the specified Code inspection frequency.

Carl Osman

CRO/nkm
Attachment

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

PRELIMINARY

STEAM GENERATOR (check one): ☒ A, ( ) B, ( ) C

REPORT DATE: 9 / 22 / 93

INDICATION NUMBER: P-SCAN #1 → Note: Non-recordable indication.

"L" DIMENSION AT START OF INDICATION *
(azimuthal location relative to feedwater nozzle): 12'-2" to 12'-7"
* SCAN dimensions (RANGE).

UT TRANSDUCER BEAM ANGLE (check one): (✓) 45°, ( ) 60°, ( ) Other _____ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: _____ inches, t: _____ (thickness) inches, a/t: _____

Embedded => 2a: _____ inches, t: _____ (thickness) inches, 2a/t: _____

INDICATION LENGTH: _____ inches

INDICATION POSITION (check one) (see notes): ( ) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: N/A inches

Carl R. Osmm Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

PRELIMINARY

STEAM GENERATOR (check one): (X) A, ( ) B, ( ) C

Acceptable per IWB/IWC-3500.

REPORT DATE: 9 / 22 / 93

INDICATION NUMBER: P-SCAN #2

"L" DIMENSION AT START OF INDICATION (azimuthal location relative to feedwater nozzle): 17'-10.4"

UT TRANSDUCER BEAM ANGLE (check one): (X) 45°, ( ) 60°, ( ) Other _____ (specify)

INDICATION ORIENTATION (check one): (X) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: .0629 inches, t: 3.62 (thickness) inches, a/t: .0174

Embedded => 2a: _____ inches, t: _____ (thickness) inches, 2a/t: _____

INDICATION LENGTH: .669 inches

INDICATION POSITION (check one) (see notes): (X) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: _____ inches

Carl R. Osman Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

PRELIMINARY

STEAM GENERATOR (check one): (X) A, ( ) B, ( ) C

REPORT DATE: 9 / 22 / 93

INDICATION NUMBER: P-Scan #3 — Acceptable per IWB/IWC -3500

"L" DIMENSION AT START OF INDICATION (azimuthal location relative to feedwater nozzle): 28' 1.3"

UT TRANSDUCER BEAM ANGLE (check one): (X) 45°, ( ) 60°, ( ) Other ____ (specify)

INDICATION ORIENTATION (check one): (X) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: .108 inches, t: 3.55 (thickness) inches, a/t: .030

Embedded => 2a: _____ inches, t: _____ (thickness) inches, 2a/t: _____

INDICATION LENGTH: 2 inches (See P-Scan data for 4-30-92 examination for explanation/comment on length.)

INDICATION POSITION (check one) (see notes): (X) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: _____

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: N/A inches

Carl R. Dennon Level III

MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

PRELIMINARY

STEAM GENERATOR (check one): X A, B, ( ) C

REPORT DATE: 9 / 22 / 33

Acceptable per IWB/IWC-3500

INDICATION NUMBER: P-Scan #4

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): 2.5' 2.5"

UT TRANSDUCER BEAM ANGLE (check one): X 45°, 60°, Other ____ (specify)

INDICATION ORIENTATION (check one): X Circumferential, Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: _____ inches, t: _____ (thickness) inches, a/t: _____

Embedded => Da: .44 inches, t: 3.662 (thickness) inches, Da/t: .061

a/t = .083

INDICATION LENGTH: 0.22 inches

INDICATION POSITION (check one) (see notes): Surface, X Embedded

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: 1.6 inches

Paul S. Carman Level III
MSS - NDE Services Unit

I. B. ROBINSON STEAM GENERATOR
NIC EXAMINATION INDICATION REPORTING

PRELIMINARY

one) [redacted] (X) A, ( ) B, ( ) C

2 / 93

SCAN #5

Acceptable per IWB/IWC-3500

OF INDICATION
ative to feedwater nozzle): 28' 6.25"

E (check one): (X) 45°, ( ) 60°, ( ) Other ____ (specify)

(check one): (X) Circumferential, ( ) Axial

MENSION:

2 inches, t: 3.62 (thickness) inches, a/t: .034

____ inches, t: ____ (thickness) inches, 2a/t: ____

66 inches

eck[redacted]) (see notes): (X) Surface[1], ( ) Embedded[2]

ations - Provide the following additional information
ent surface indications located within 2.6 inches of
ne above reported indication:

Indication Number: N/A

nd spacing between indications: ____ inches

indication length: ____ inches

dimension: a/t: ____ inches

Indication Number: N/A

nd spacing between indications: ____ inches

indication length: ____ inches

dimension: a/t: ____ inches

ations - Provide the existing ligament between the UT
d the steam generator inside (I.D.) surface.

: [redacted] N/A inches

Carl R. Cowan Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

PRELIMINARY

STEAM GENERATOR (check one): (X) A, ( ) B, ( ) C

REPORT DATE: 9 / 22 / 93

INDICATION NUMBER: P-Scan #6

Acceptable Per IWB/IWC-3500

"L" DIMENSION AT START OF INDICATION (azimuthal location relative to feedwater nozzle): 38° 2.17"

UT TRANSDUCER BEAM ANGLE (check one): ( ) 45°, (X) 60°, ( ) Other ____ (specify)

INDICATION ORIENTATION (check one): (X) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: _____ inches, t: _____ (thickness) inches, a/t: _____

Embedded => 2a: .108 inches, t: 3.62 (thickness) inches, 2a/t: .030

a/t = .015

INDICATION LENGTH: 1.57 inches

INDICATION POSITION (check one) (see notes): ( ) Surface[1], (X) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: .618 inches

Carl R. Carmen Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

FINAL

STEAM GENERATOR (check one): (✓) A, ( ) B, ( ) C

Non-Recordable Indication

REPORT DATE: ___ / ___ / 93

INDICATION NUMBER: P-Scan #1

Based on Siemens Power Corp. Final Report of examination.

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): 12'2" - 12'6"

UT TRANSDUCER BEAM ANGLE (check one): (✓) 45°, ( ) 60°, ( ) Other ____ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: _____ inches, t: _____ (thickness) inches, a/t: _____

Embedded => 2a: _____ inches, t: _____ (thickness) inches, 2a/t: _____

INDICATION LENGTH: _____ inches

INDICATION POSITION (check one) (see notes): ( ) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: N/A inches

Carl R. Damon UT Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

FINAL

Based on Siemens Power Corp. Final Report of examination.

STEAM GENERATOR (check one): (✓) A, ( ) B, ( ) C

REPORT DATE: ____ / ____ / 93

INDICATION NUMBER: P-Scan #2

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): 17' 10.4"

UT TRANSDUCER BEAM ANGLE (check one): (✓) 45°, ( ) 60°, ( ) Other ____ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: .0629 inches, t: 3.62 (thickness) inches, a/t: .0174

Embedded => 2a: ____ inches, t: ____ (thickness) inches, 2a/t: ____

INDICATION LENGTH: .669 inches

INDICATION POSITION (check one) (see notes): ( ) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: ____ inches

   Adjacent indication length: ____ inches

   Thru-wall dimension: a/t: ____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: ____ inches

   Adjacent indication length: ____ inches

   Thru-wall dimension: a/t: ____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: ____ inches

Carl R. Osmon UT Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

STEAM GENERATOR (check one): (✓) A, ( ) B, ( ) C

FINAL

REPORT DATE: ___ / ___ / 93

Based on Siemens Power Corp. Final Report of exam.

INDICATION NUMBER: P-Scan #3

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): 28' 1.3"

UT TRANSDUCER BEAM ANGLE (check one): (✓) 45°, ( ) 60°, ( ) Other ___ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: .108 inches, t: 3.55 (thickness) inches, a/t: .030

Embedded => 2a: ___ inches, t: ___ (thickness) inches, 2a/t: ___

INDICATION LENGTH: 1.574 inches

INDICATION POSITION (check one) (see notes): (✓) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: ___ inches

   Adjacent indication length: ___ inches

   Thru-wall dimension: a/t: ___ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: ___ inches

   Adjacent indication length: ___ inches

   Thru-wall dimension: a/t: ___ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: ___ inches

Carl R. Osmon UT Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

STEAM GENERATOR (check one): (✓) A, ( ) B, ( ) C

REPORT DATE: ____ / ____ / 93

Non-Recordable Indication

INDICATION NUMBER: P-Scan #4

FINAL

Based on Siemens Power Corp. Final Report of examination.

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): 28' 2.5"

UT TRANSDUCER BEAM ANGLE (check one): (✓) 45°, ( ) 60°, ( ) Other ____ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: _____ inches, t: _____ (thickness) inches, a/t: _____

Embedded => 2a: _____ inches, t: _____ (thickness) inches, 2a/t: _____

INDICATION LENGTH: _____ inches

INDICATION POSITION (check one) (see notes): ( ) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: _____ inches

Carl R. Osman UT Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

STEAM GENERATOR (check one): (✓) A, ( ) B, ( ) C

FINAL

Based on Siemens Power Corp. Final Report of examination.

REPORT DATE: ____ / ____ / 93

Acceptable per IWB/IWC-3500

INDICATION NUMBER: P-Scan #5

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): 28'-6.25"

UT TRANSDUCER BEAM ANGLE (check one): (✓) 45°, ( ) 60°, ( ) Other ____ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: .122 inches, t: 3.62 (thickness) inches, a/t: .034

Embedded => 2a: ____ inches, t: ____ (thickness) inches, 2a/t: ____

INDICATION LENGTH: .566 inches

INDICATION POSITION (check one) (see notes): (✓) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: N/A

   End-to-end spacing between indications: ____ inches

   Adjacent indication length: ____ inches

   Thru-wall dimension: a/t: ____ inches

   (B) Adjacent Indication Number: N/A

   End-to-end spacing between indications: ____ inches

   Adjacent indication length: ____ inches

   Thru-wall dimension: a/t: ____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: ____ inches

Carl R. Osmm UT Level III
MSS - NDE Services Unit

H. B. ROBINSON STEAM GENERATOR
ULTRASONIC EXAMINATION INDICATION REPORTING

STEAM GENERATOR (check one): (✓) A, ( ) B, ( ) C

FINAL

REPORT DATE: ___ / ___ / 93

Acceptable per IWB/IWC-3500

Based on Siemens Power Corp. Final Report of examination.

INDICATION NUMBER: P-Scan #6

"L" DIMENSION AT START OF INDICATION
(azimuthal location relative to feedwater nozzle): _____

UT TRANSDUCER BEAM ANGLE (check one): ( ) 45°, (✓) 60°, ( ) Other _____ (specify)

INDICATION ORIENTATION (check one): (✓) Circumferential, ( ) Axial

INDICATION THRU-WALL DIMENSION:

Surface => a: _____ inches, t: _____ (thickness) inches, a/t: _____

Embedded => 2a: .108 inches, t: 3.62 (thickness) inches, 2a/t: .030

a/t = .015

INDICATION LENGTH: .787 inches

INDICATION POSITION (check one) (see notes): ( ) Surface[1], ( ) Embedded[2]

NOTES:

1. Surface Indications - Provide the following additional information for any adjacent surface indications located within 2.6 inches of the ends of the above reported indication:

   (A) Adjacent Indication Number: _____

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

   (B) Adjacent Indication Number: _____

   End-to-end spacing between indications: _____ inches

   Adjacent indication length: _____ inches

   Thru-wall dimension: a/t: _____ inches

2. Embedded Indications - Provide the existing ligament between the UT indication and the steam generator inside (I.D.) surface.

   Ligament: .700 inches

Carl R. Osman UT Level III
MSS - NDE Services Unit

SIEMENS

FINAL REPORT

CAROLINA POWER & LIGHT

H. B. ROBINSON

P-SCAN UT OF S/G "A"

SEPTEMBER, 1993

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

December 8, 1993

Mr. Carl Osman
Carolina Power& Light
3932 New Hill-Holleman Road
New Hill, N. C. 27562-0327

Subject: Final Report of P-Scan Ultrasonic examination of S/G "A", Girthweld # 5 at H. B. Robinson

Dear Mr. Osman:

As per your request, please find enclosed a copy of the final report of subject examination and a diskette containing all the data.

Please accept my apology for the delay in delivery of this report. Should you require further assistance, please do not hesitate to call me at (615) 499-1733.

Sincerely,

Y. Khan 12/8/93

Yousuf Khan
Project Manager, Field Services

YK:svs

Attachments

cc: R. O. Harris
J. Cipriani
Scott Larsen, Nuclear Energy Services

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

INDEX

Certificate of Compliance

Activities described in the Ultrasonic Inspection Report (HBRSGA#5.P93) were conducted in accordance with the Siemens Power Corporation Quality Assurance Program Manual, (Revision 14, Dated 07/15/92) and the applicable requirements of Nuclear Energy Service P.O.# N21213 dated 6/10/93.

John E. Cipriani
Manager of Quality Assurance

12/8/93
Date

Valid for Inspection Reports

Report No.	Weld Identification	Report No.	Weld Identification
HBRSGA#5.P93	SG-A /#5		

Calibration Block No.: CP&L 50A

Material : Carbon Steel

Drawing No.: N/A

Temperature Range : 103°- 113°F

Calibration Reflectors

No.	Type	Dimension	Location	Orientation	Remarks
1	SDH	ϕ 3mm	¼ T	circumferential	
2	SDH	ϕ 3mm	½ T	circumferential	
3	SDH	ϕ 3mm	¾ T	circumferential	
4	SDH	ϕ 3mm	1¼ T	circumferential	
5	radius	∞	1.0"	N/A	EIS007

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

J. Smedley

Y. Khan 12/9/93

Instrument Linearity Verification (Initial)

UT Equipment S/N : 325
Date : 09/17/93 Time : 14:00 Temperature : 72°F

Vertical Screen Linearity

Signal #1 (FSH)	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
Signal #2 (FSH)	51	45	41	35	30	26	19	15	10	5

Attenuator Linearity

Gain Setting	80%	-6dB	-12dB	40%	+6dB	20%	+12dB
Amplitude Reading		41	20		80		81
Tolerance		32%-48%	16%-24%		64%-96%		64%-96%

Inspector : J. Smedley UT-IIA Date : 12/07/93 J. Smedley

Instrument Linearity Verification (Final)

UT Equipment S/N : 325
Date : 09/21/93 Time : 13:00 Temperature : 72 °F

Vertical Screen Linearity

Signal #1 (FSH)	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
Signal #2 (FSH)	50	44	41	36	30	26	20	16	10	5

Attenuator Linearity

Gain Setting	80%	-6dB	-12dB	40%	+6dB	20%	+12dB
Amplitude Reading		40	20		80		80
Tolerance		32%-48%	16%-24%		64%-96%		64%-96%

Inspector : J. Smedley UT-IIA Date : 12/07/93 J. Smedley

Reviewed by : Y. Khan UT-III Date : 12/07/93 Y. Khan 12/8/93

DAC- Data

Transducer	Reference Reflector				Soundpath [mm]		Amplitude [dB]		Cal-Block or Ref.-Block No.	Remarks
	Type	Dimension	Location	Orientation	Initial	Final	Initial	Final		
1	SDH	ϕ 3mm	¼ T	circumf.	26.7	26.4	81	81	CP&L 50A	
1	SDH	ϕ 3mm	½ T	circumf.	56.7	57.0	78	78	CP&L 50A	
1	SDH	ϕ 3mm	¾ T	circumf.	92.0	92.6	72	71	CP&L 50A	
1	SDH	ϕ 3mm	1¼ T	circumf.	155.0	148.0	57	56	CP&L 50A	
1	radius	∞	1.0"	N/A	25.9	25.6	73	74	EIS007	recheck
2	SDH	ϕ 3mm	¼ T	circumf.	39.9	40.0	72	71	CP&L 50A	
2	SDH	ϕ 3mm	½ T	circumf.	84.0	84.0	66	66	CP&L 50A	
2	SDH	ϕ 3mm	¾ T	circumf.	130.0	130.0	61	61	CP&L 50A	
2	SDH	ϕ 3mm	1¼ T	circumf.	208.0	206.3	49	49	CP&L 50A	
2	radius	∞	1.0"	N/A	27.6	27.4	69	70	EIS007	recheck

Initial Calibration: 09/17/93 14:00 Cal-Block Temperature : 113°F
Final Calibration: 09/21/93 13:40 Cal-Block Temperature: 103°F

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

J. Smedley

Y. Khan
12/8/93

Beam-Spread Measurements

MWB 45 Serial #: 07904

Reflector	Amplitude	Soundpath	Surface Distance
¼T SDH	-6 dB foreward	24.6mm	19.0mm
	peak	27.3mm	22.0mm
	-6 dB backward	28.8mm	25.0mm
½T SDH	-6 dB foreward	54.6mm	37.0mm
	peak	56.8mm	43.0mm
	-6 dB backward	61.9mm	50.0mm
¾T SDH	-6 dB foreward	85.4mm	60.0mm
	peak	90.9mm	67.0mm
	-6 dB backward	95.4mm	74.0mm
1¼T SDH	-6 dB foreward	114.0mm	96.0mm
	peak	118.8mm	103.0mm
	-6 dB backward	127.3mm	112.0mm

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

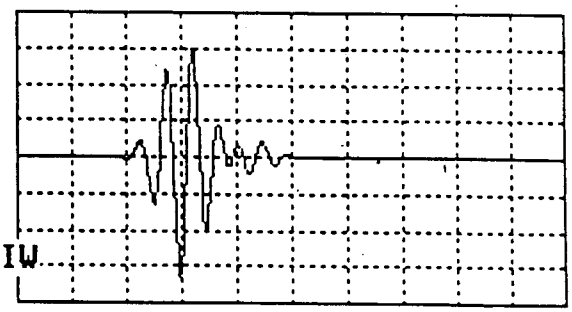
J. Smedley

Y. Khan 12/8/93

Aerotech

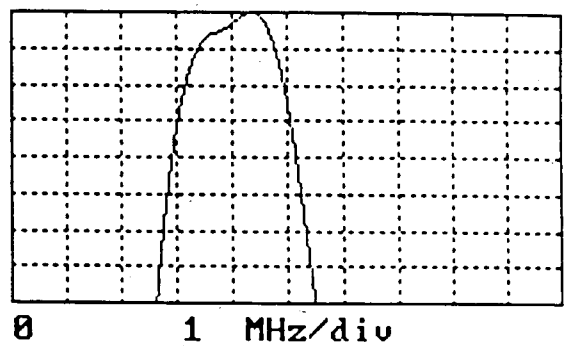
Transducer Certification

DATE: 10-31-1989
MODEL 083-056-927
SERIES: STYLE: MWB45-4
SERIAL #07904
DIAMETER: 8X9 in. CONNECTOR: LEMO
NOMINAL FREQUENCY: 4 MHz



TEST SETUP--
TEST BLOCK THICKNESS: 4.000 MATERIAL: STEEL IIW
ENERGY SETTING: 2
IMPEDANCE SETTING: 50 OHMS

TEST DATA--
PEAK FREQUENCY: 4.30 MHz
RELATIVE SENSITIVITY: 29 dB
INSPECTOR: B.BENNETT



EQUIPMENT USED:
UTA-4 (S/N 103 CAL THRU 10-89)
TEK 2430 SCOPE (S/N B012909 CAL THRU 10-89)
TEK PEP301 CONTROLLER
PROCEDURE: WAVEFORM SHOWN IS THE FIRST RETURN ECHO FROM THE INDICATED TARGET

THE ACCURACY OF THE INSTRUMENT DESCRIBED ABOVE HAS BEEN CONFIRMED BY FACTORY STANDARD TEST EQUIPMENT AND LABORATORY REFERENCE STANDARDS TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS.

Krautkramer Branson
P.O. Box 350, Lewistown, PA 17044
(717) 242-0327 Fax: 717-242-2606

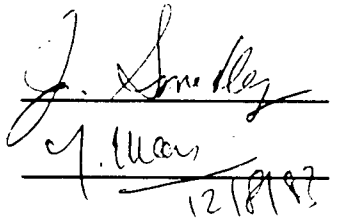
Beam-Spread Measurements

MWB 60 Serial #: 06902

Reflector	Amplitude	Soundpath	Surface Distance
¼T SDH	-6 dB foreward	36.4mm	32.0mm
	peak	41.2mm	37.0mm
	-6 dB backward	46.5mm	43.0mm
½T SDH	-6 dB foreward	75.3mm	65.0mm
	peak	88.3mm	80.0mm
	-6 dB backward	100.9mm	93.0mm
¾T SDH	-6 dB foreward	110.8mm	104.0mm
	peak	127.7mm	115.0mm
	-6 dB backward	145.0mm	133.0mm
1¼T SDH	-6 dB foreward	197.2mm	135.0mm
	peak	205.4mm	154.0mm
	-6 dB backward	232.0mm	171.0mm

Inspector : J. Smedley UT-IIA Date : 12/07/93

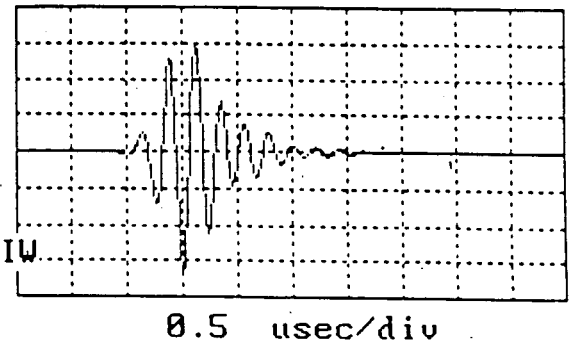
Reviewed by : Y. Khan UT-III Date : 12/07/93



Aerotech

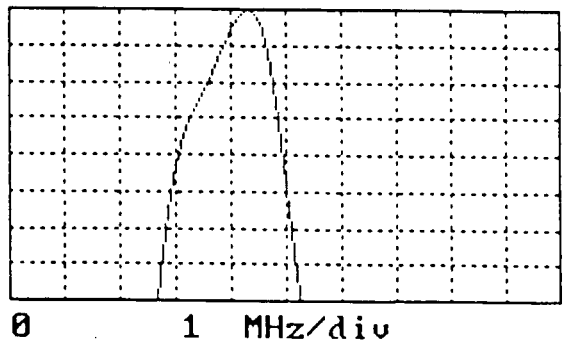
Transducer Certification

DATE: 01-02-1990
MODEL 083-056-928
SERIES: STYLE: MWB60-4
SERIAL #06902
DIAMETER: 8X9 in. CONNECTOR: LEMO
NOMINAL FREQUENCY: 4 MHz



TEST SETUP--
TEST BLOCK THICKNESS: 4.000 MATERIAL: STEEL IIW
ENERGY SETTING: 2
IMPEDANCE SETTING: 50 OHMS

TEST DATA--
PEAK FREQUENCY: 4.30 MHz
RELATIVE SENSITIVITY: 23 dB
INSPECTOR: B.BENNETT



EQUIPMENT USED:
UTA-4 (S/N 103 CAL THRU 10-90)
TEK 2430 SCOPE (S/N B012909 CAL THRU 10-90)
TEK PEP301 CONTROLLER
PROCEDURE: WAVEFORM SHOWN IS THE FIRST RETURN ECHO FROM THE INDICATED TARGET

THE ACCURACY OF THE INSTRUMENT DESCRIBED ABOVE HAS BEEN CONFIRMED BY FACTORY STANDARD TEST EQUIPMENT AND LABORATORY REFERENCE STANDARDS TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS.

Krautkramer Branson
P.O. Box 350, Lewistown, PA 17044
(717) 242-0327 Fax: 717-242-2606

Client: Carolina Power & Light
Location: H.B. Robinson, Hartsville, SC

System: Steamgenerator "A"
Weld ID No.: #5

Inspected Area:

Indication #1: 12' 2" - 12' 6"	Indication #4: 28' 0" - 28' 4"
Indication #2: 17' 7" - 17'11"	Indication #5: 28' 3" - 28' 7"
Indication #3: 28' 0" - 28' 4"	Indication #6: 38' 0" - 38' 4"

Reference Point: Circumferential positions taken clockwise from centerline of feedwater nozzle, axial positions taken from weld center-line.

Conclusion of Inspection Results:

In comparing the 1992 and the 1993 ultrasonic inspection data, the six indications analyzed in steamgenerator "A" show only minor differences. All differences noted are insignificant in either amplitude, length and thru-wall dimension and are inconsistent when related to the general pattern of indication growth. All indications were analyzed at noise level to provide a common basis for comparison.

In the opinion of the undersigned, there have been no significant dimensional changes of the indications between the April 1992 and September 1993 inspection.

CRD
12/16/93

Y. Khan 12/8/93

Responsible Inspector : Yousuf Khan Level: UT-III Date: 12/07/93

SIEMENS

December 21, 1993

Mr. Carl Osman
Carolina Power & Light
P. O. Box 327
New Hill, NC 27562

Dear Mr. Osman:

Reference: Your letter dated 12/16/93

Subject: Ultrasonic Examination of weld 5 S/G "A"
at H. B. Robinson, September, 1993

In response to your above referenced letter and subject matter additional comments are given in the attached Addendum to the Ultrasonic Inspection Report #HBRSGA #5.P93 dated 12/7/93.

I hope that the comments given are enough to satisfy your Engineering Department. All comments given were discussed with you at the Robinson site during discussions that took place at the time of the preliminary report review.

If I may be of any further assistance, please let me know.

Sincerely,

Y. Khan 12/21/93

Yousuf A. Khan
Project Manager
Level III UT

YAK:930285:skt

Attachment

cc: R.O. Harris
M. Tagliamonte
J.E. Cipriani

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

December 21, 1993

ADDENDUM

ULTRASONIC INSPECTION REPORT
HBRSGA #5.P93 DATED 12/7/93

Given below are additional comments explaining the dimensional changes that appear between the 1992 and 1993 ultrasonic examination data.

1. The 1992 manipulator installation positions could not be duplicated in 1993, which changed the relationship between the orientation of the indication and the impinging ultrasonic energy, hence the slight projectional change.

2. Uneven scanning surface consisting of gouges and depressions in which transducer contact can change from scan to scan, this situation is common to all scanned areas, however in some areas it is more pronounced than others.

3. General working conditions inside the bioshield were unfavorable because of which 50% of the areas had to be re-scanned.

Yousuf A. Khan
Level III UT

12/21/93
Date

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

CP&L

Carolina Power & Light Company
P. O. Box 327
New Hill, NC 27562

December 16, 1993

Mr. Yousuf Khan
Siemens Power Corporation
5959 Shallowford Road, Suite 531
Chattanooga, TN 357421

Dear Mr. Khan:

I have reviewed the Siemens report for this latest ultrasonic examination of the Robinson Plant Unit 2 Steam Generator "A", Weld 5 and noticed there has not been included any explanations/ comments as to why the reported dimensions of some of the indications have changed. As mentioned, some explanation will be expected by our Nuclear Engineering Department personnel so that they conclude the examination effort is complete, the indications resolved and the issue can be closed out.

Please provide some written "words" as soon as possible.

Yours truly,

Carl Osman

Carl R. Osman
Principle NDE Specialist

CRO/nkm

Weld Identification : SG-A /#5 Drawing No. : N/A
Diskette Name : HBRSGA#5_P93 Report File No. : HBRSGA#5.P93 [WP60]
Type of Weld : Butt-weld
Base Material : Carbon Steel
Diameter : 13' 10" Thickness : 3.543" Circumference : 43' 5"
Condition of Scanning Surface : ground Temperature : 104°F

Inspection Method : P-Scan /semi auto
Procedure No. : SPC-AUT-20 Revision : 0 Dated : 03/10/92
System Calibration Report No. : HBRSGCAL.P93

Inspection Equipment

Transducers	# 1	# 2	# 3	# 4	# 5	# 6
Manufacturer	KKB	KKB				
Type	MWB	MWB				
Serial No.	07904	06902				
Crystal Size [mm]	8x9	8x9				
Frequency [MHz]	4.0	4.0				
Actual Angle α [°]	45.0	60.0				
Exit Point [mm]	12.6	12.6				

	UT Equipment	Scanner	UT Cables	Couplant
Manufacturer	FORCE	FORCE	Belden 20'	ECHO
Type	PSP-3	MWS-2	RG-174U	Ultragel II
Serial No.	325	507	N/A	N/A
Calibration Date	N/A	N/A	N/A	N/A

Inspector : P. Shamblin UT-IIA Date : 12/07/93

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

Weld Identification : SG-A /#5
System Calibration Report No. : HBRSGCAL.P93

Calibration Block : N/A
Reference Block : EIS007
UT Equipment S/N : 325

Ref. Reflector : N/A
Ref. Reflector : 1" radius
Thermometer S/N: CPL-R-242-R

Temperature: N/A°F
Temperature: 72°F

System Recheck

Name	Date		#1	#2	#3	#4	#5	#6
J. Smedley	09/19	Amplitude [dB]	73	69				
	11:00	Soundpath [mm]	25.9	27.6				
J. Smedley	09/19	Amplitude [dB]	73	69				
	17:00	Soundpath [mm]	25.9	27.6				
J. Smedley	09/20	Amplitude [dB]	73	68				
	09:30	Soundpath [dB]	25.9	27.6				
J. Smedley	09/21	Amplitude [dB]	73	70				
	08:00	Soundpath [mm]	25.9	27.6				
J. Smedley	09/21	Amplitude [dB]	73	70				
	10:50	Soundpath [mm]	25.6	27.4				
J. Smedley	09/12	Amplitude [dB]	73	69				
	12:30	Soundpath [mm]	25.9	27.6				
		Amplitude [dB]						
		Soundpath [mm]						
		Amplitude [dB]						
		Soundpath [mm]						
		Amplitude [dB]						
		Soundpath [mm]						

Inspector : P. Shamblin UT-IIA Date : 12/07/93

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

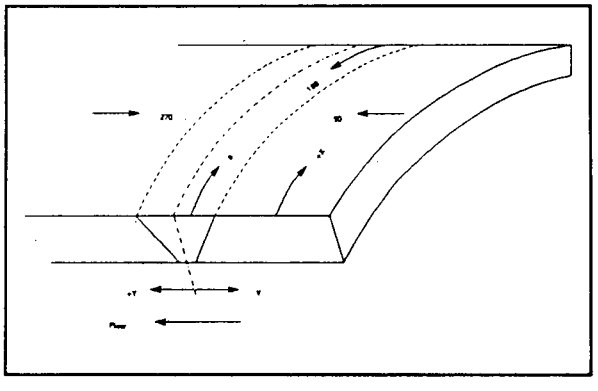
Weld Identification : SG-A /#5

Weld Crown Width : N/A Main Zone Width : 100.0mm (3.94")

Transducer / Setup Parameters

#	Type	Mode	Crystal	Freq.	Angle	X-Start	X-End	Y-Start	Y-End	Scan	File Name
1	MWB	shear	single	4.0	45°	0"	4.0"	-.086"	-4.3"	90°	AxB45.1
1	MWB	shear	single	4.0	45°	0"	4.0"	.086"	4.3"	270°	AxT45.1
2	MWB	shear	single	4.0	60°	0"	4.0"	-1.5"	-7.5"	90°	AxB60.1

Scanning Coordinates



Top Bottom

Recording Level

Transducer #	Reference	Recording Level
1	DAC	-6 dB
2	DAC	-6 dB

Inspector : P. Shamblin UT-IIA Date : 12/07/93

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

Weld Identification : SG-A /#5

Indication List

Scan	Probe No.	Indication No.	X Pos.			Y Pos.					
			Start	Max.	End	Start	Max.	End	Size *	DAC	Remarks
90°	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10%	non recordable
90°	1	2	1.89	2.11	2.52	N/A	.738	N/A	.063"	80%	recordable
90°	1	3	2.1	2.33	3.68	N/A	-.738	N/A	.108"	63%	recordable
270°	1	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	32%	non recordable
90°	1	5	.85	1.16	1.64	N/A	-.246	N/A	.122"	80%	recordable
90°	2	6	1.13	1.38	1.73	N/A	.062	N/A	.108"	56%	recordable

* denotes Thru-Wall dimension
X-positions in reference to inspection areas

Inspector : P. Shamblin UT-IIA Date : 12/07/93

Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

Data Comparison of Weld Identification: SG-A /#5

Indication #	Amplitude (of DAC)		Length in inches		Thru-Wall in inches	
	1992	1993	1992	1993	1992	1993
1	45%	11%	N/A	N/A	N/A	N/A
2	70%	90%	.560	.669	.068	.063
3	90%	70%	2.000	1.574	.138	.108
4	56%	20%	.610	N/A	.200	N/A
5	80%	90%	.590	.566	.180	.122
6	63%	63%	1.180	.787	.090	.108

Note: To evaluate indication length, all comparison were made at noise level.

Inspector : P. Shamblin UT-IIA Date : 12/07/93

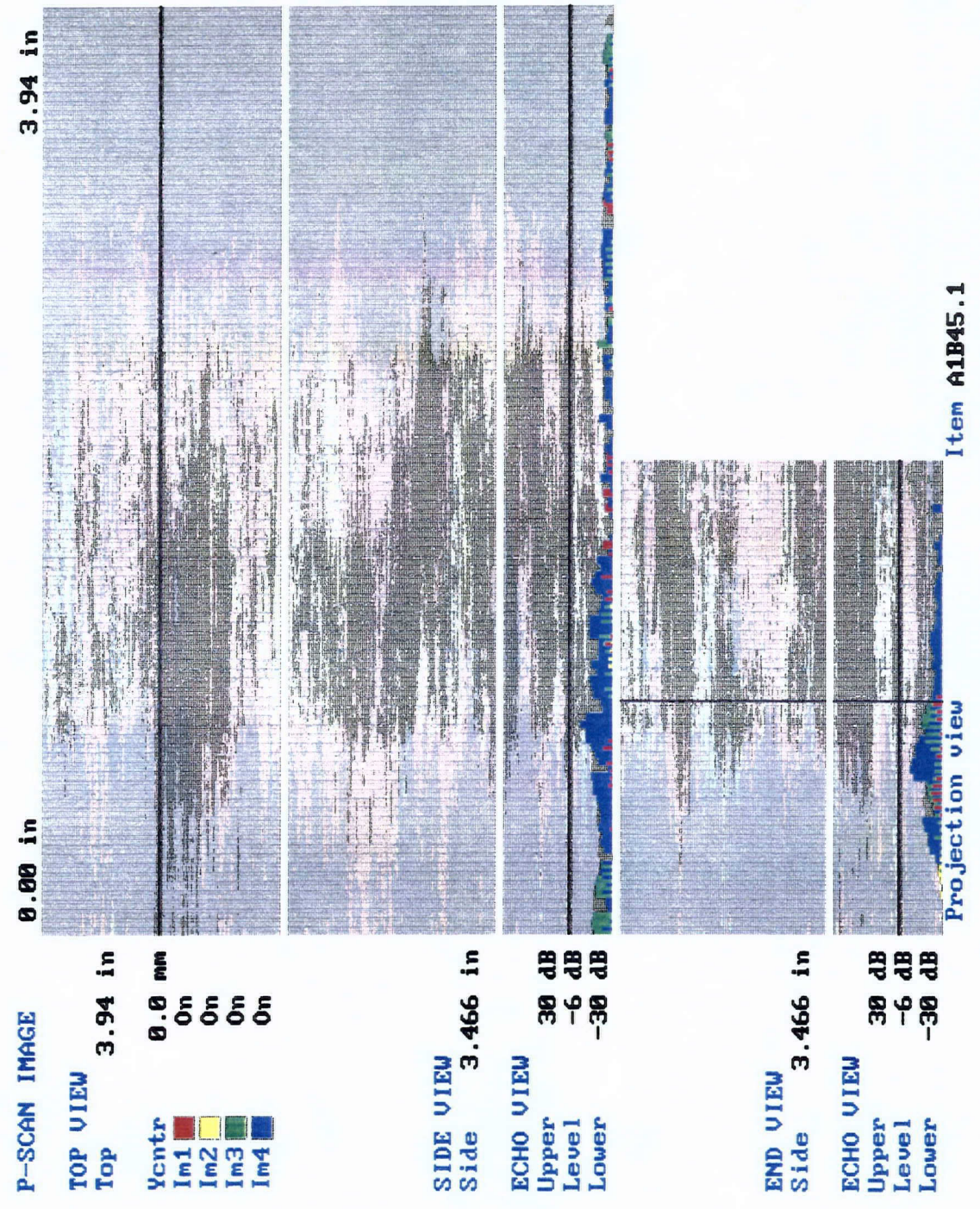
Inspector : J. Smedley UT-IIA Date : 12/07/93

Reviewed by : Y. Khan UT-III Date : 12/07/93

12/8/93

SG-A /#5

Indication #1
Image at -6 dB (50% DAC)

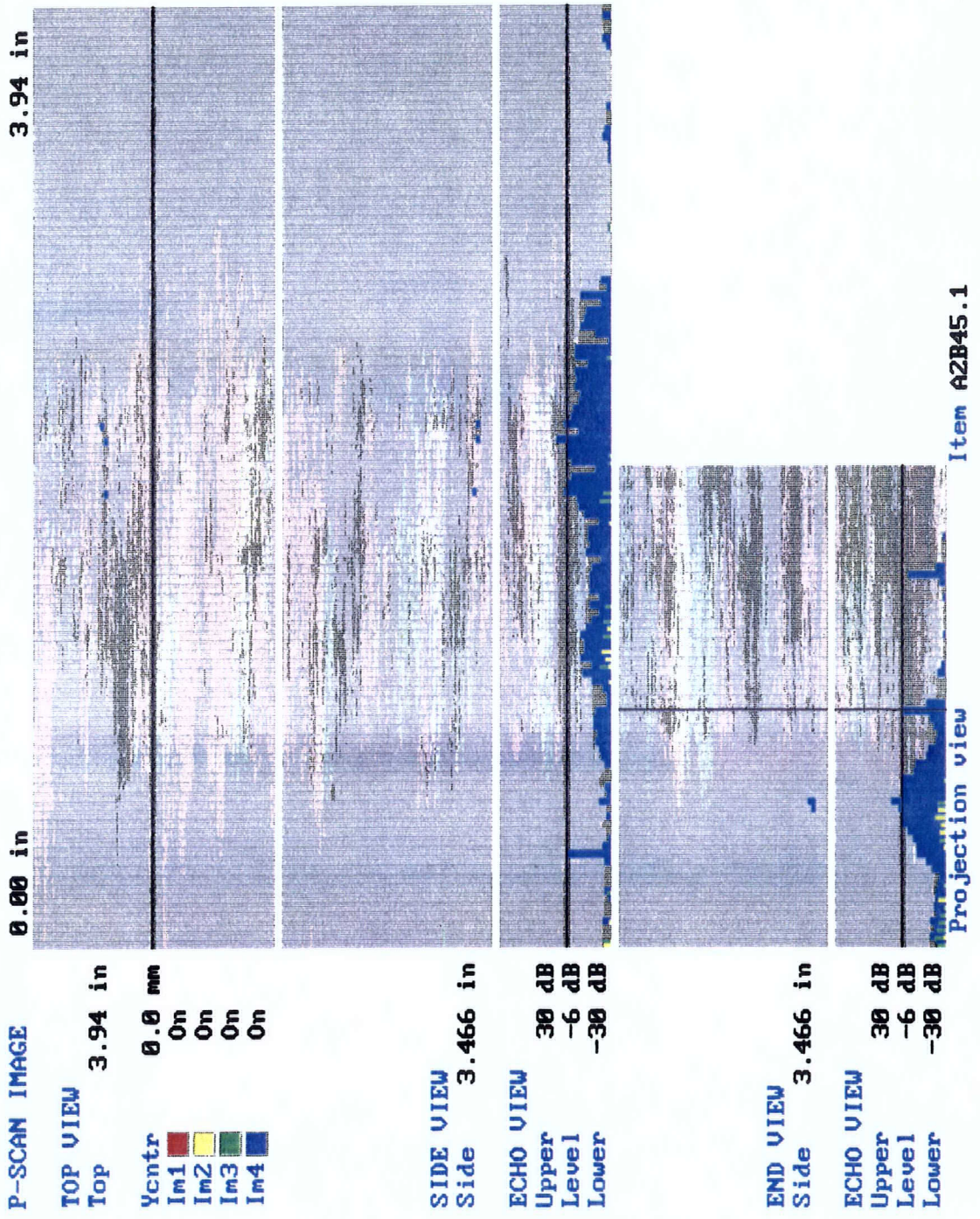


Reviewed by : Y. Khan UT-III Date : 12/07/93

Y. Khan 12/8/93

SG-A /#5

Indication #2
Image at -6 dB (50% DAC)

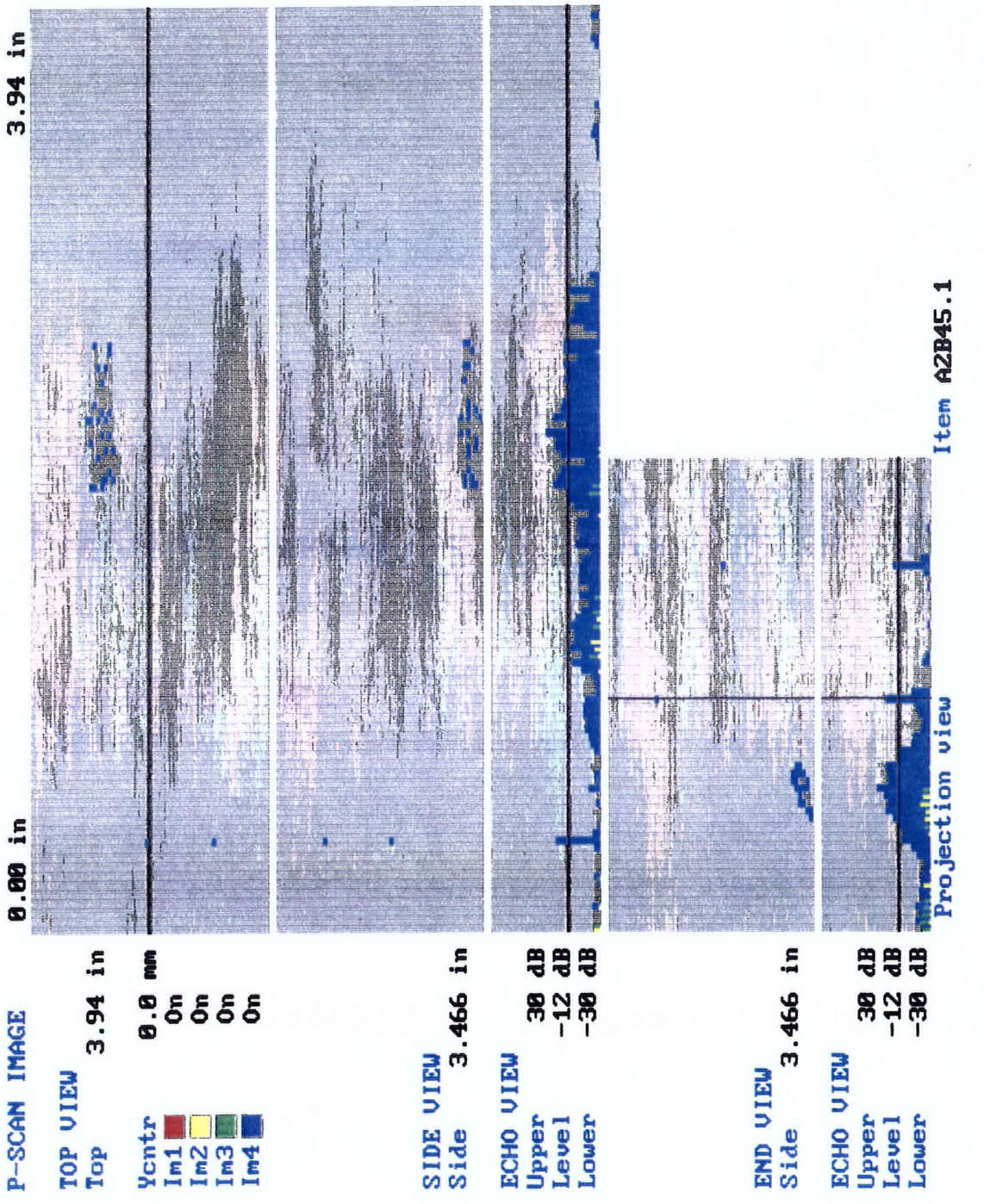


Reviewed by : Y. Khan UT-III Date : 12/07/93

Y. Khan 12/8/93

SG-A /#5

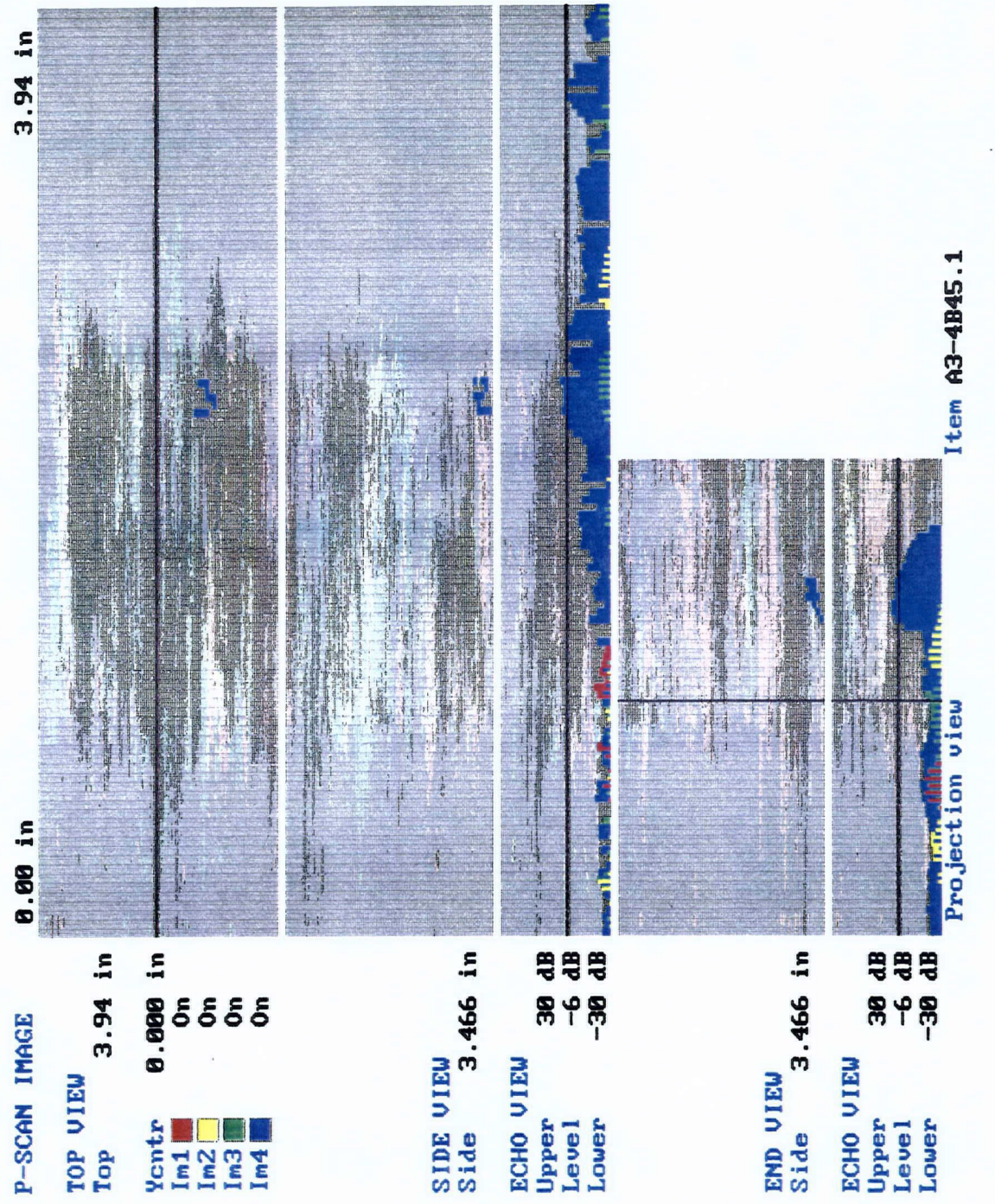
Indication #2
Image at -12 dB (25% DAC)



Reviewed by : Y. Khan UT-III Date : 12/07/93

SG-A /#5

Indication #3
Image at -6 dB (50% DAC)

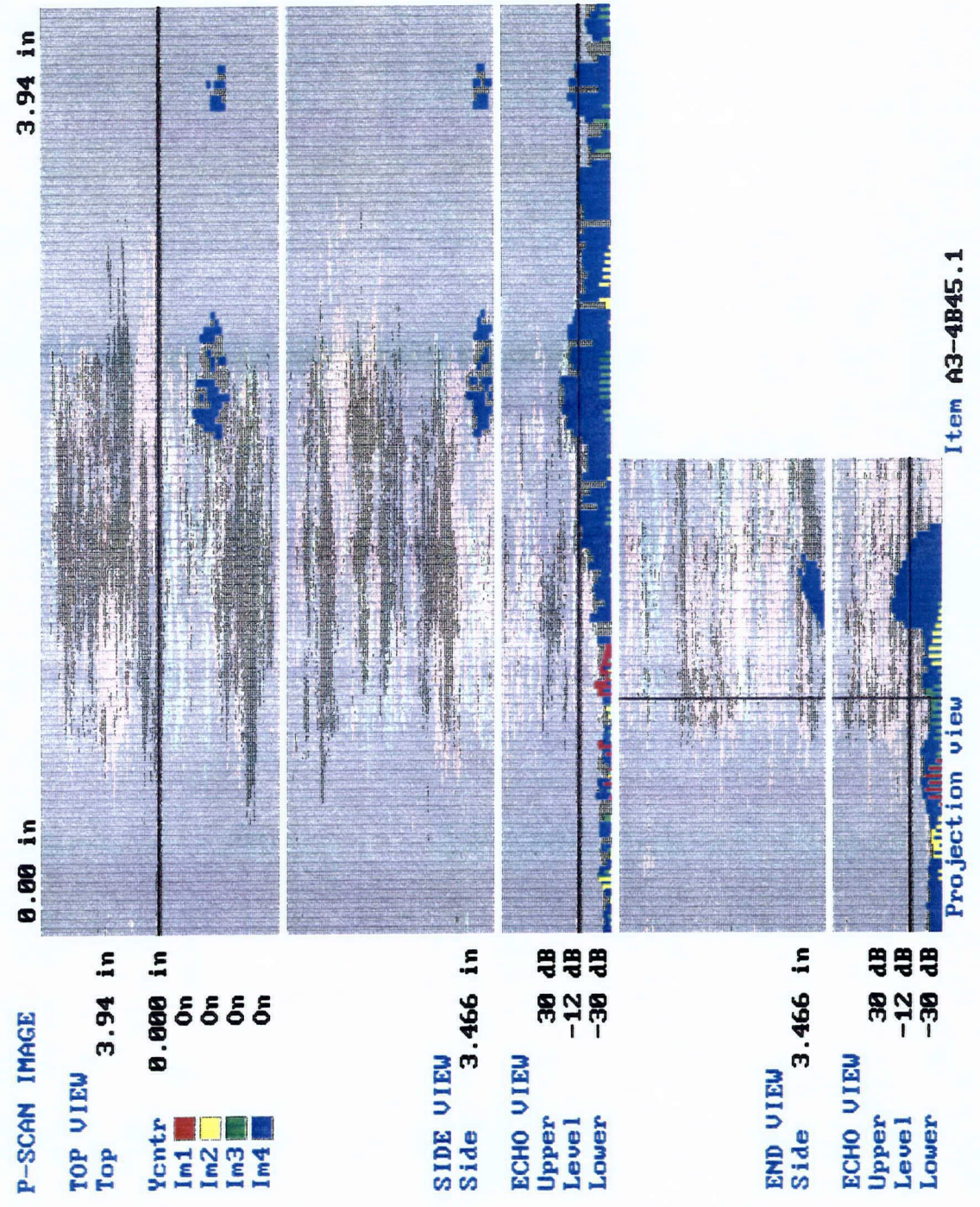


Reviewed by : Y. Khan UT-III Date : 12/07/93

12/8/93

SG-A /#5

Indication #3
Image at -12 dB (25% DAC)

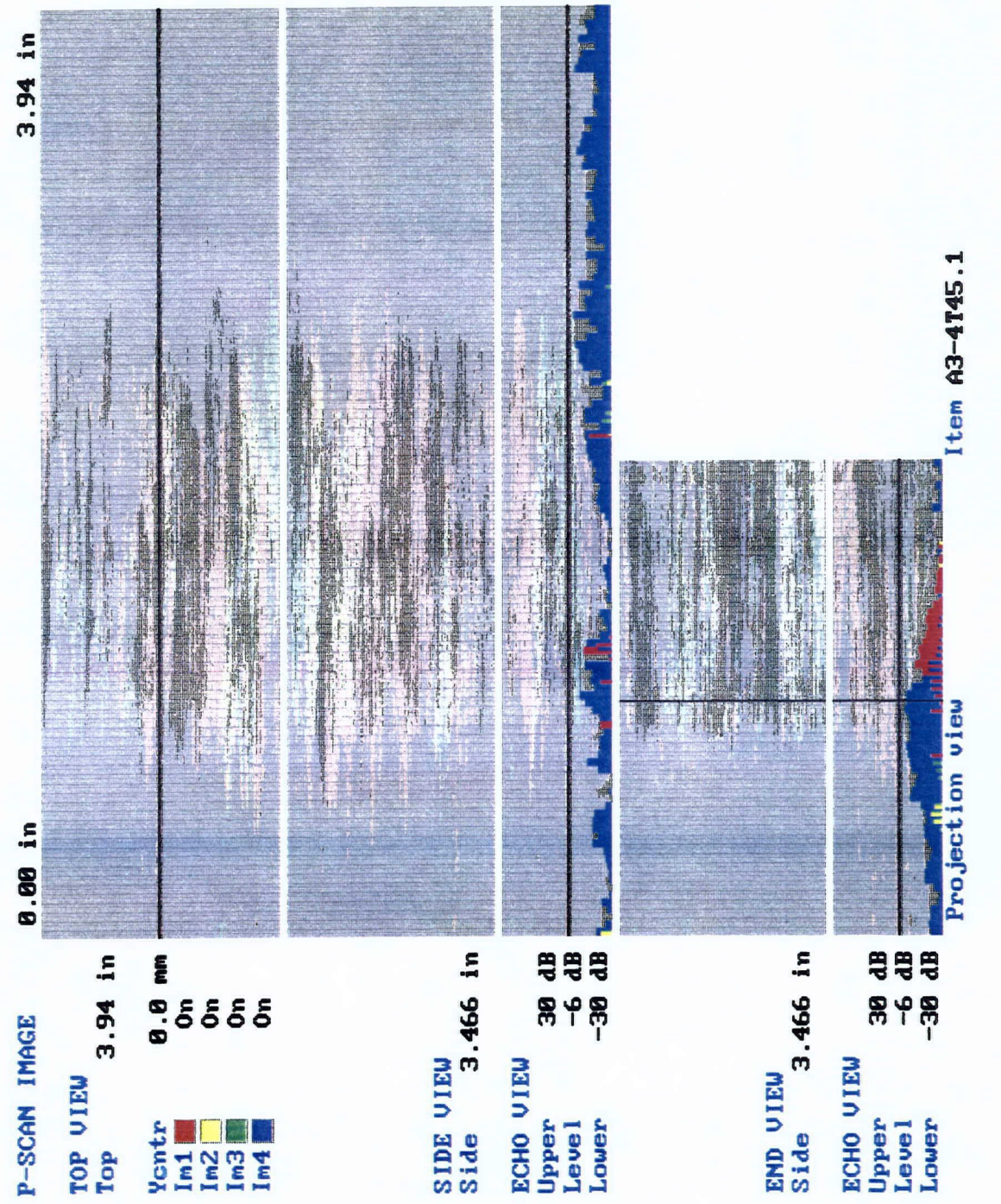


Reviewed by : Y. Khan UT-III Date : 12/07/93

12/8/93

SG-A /#5

Indication #4
Image at -6 dB (50% DAC)

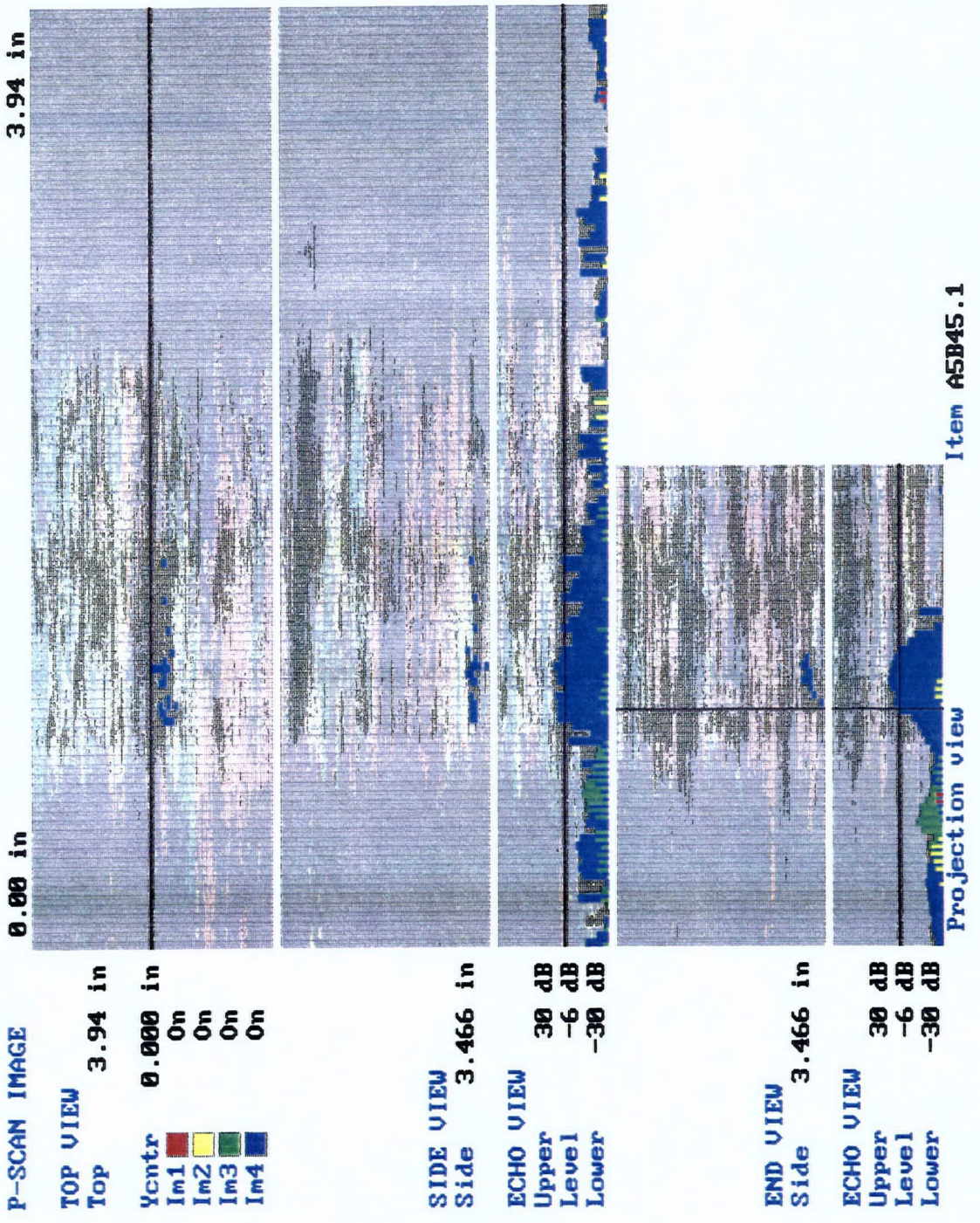


Reviewed by : Y. Khan UT-III Date : 12/07/93

SG-A /#5

Indication #5

Image at -6 dB (50% DAC)



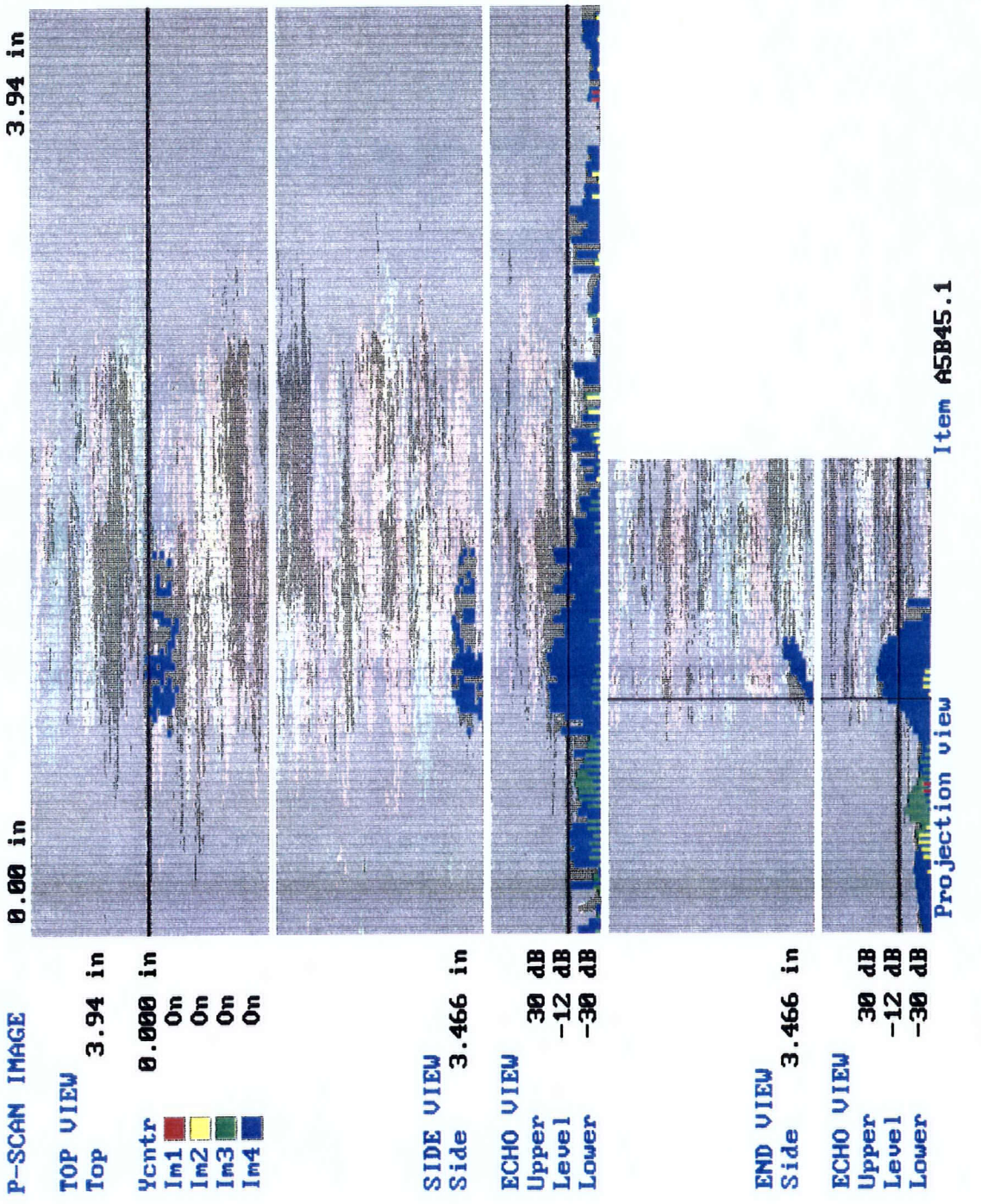
Reviewed by : Y. Khan UT-III Date : 12/07/93

12/8/93

SG-A /#5

Indication #5

Image at -12 dB (25% DAC)

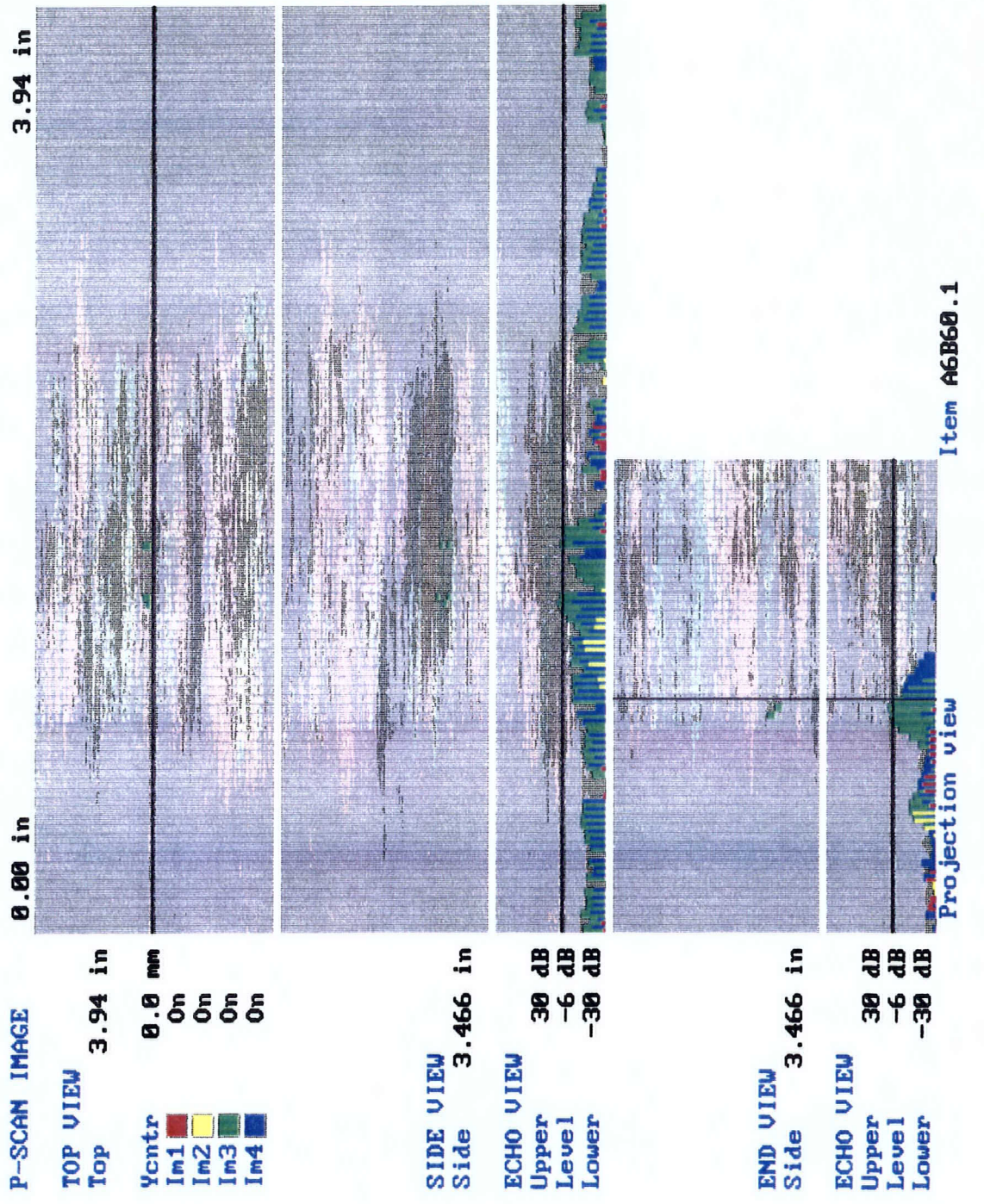


Reviewed by : Y. Khan UT-III Date : 12/07/93

12/8/93

SG-A /#5

Indication #6
Image at -6 dB (50% DAC)

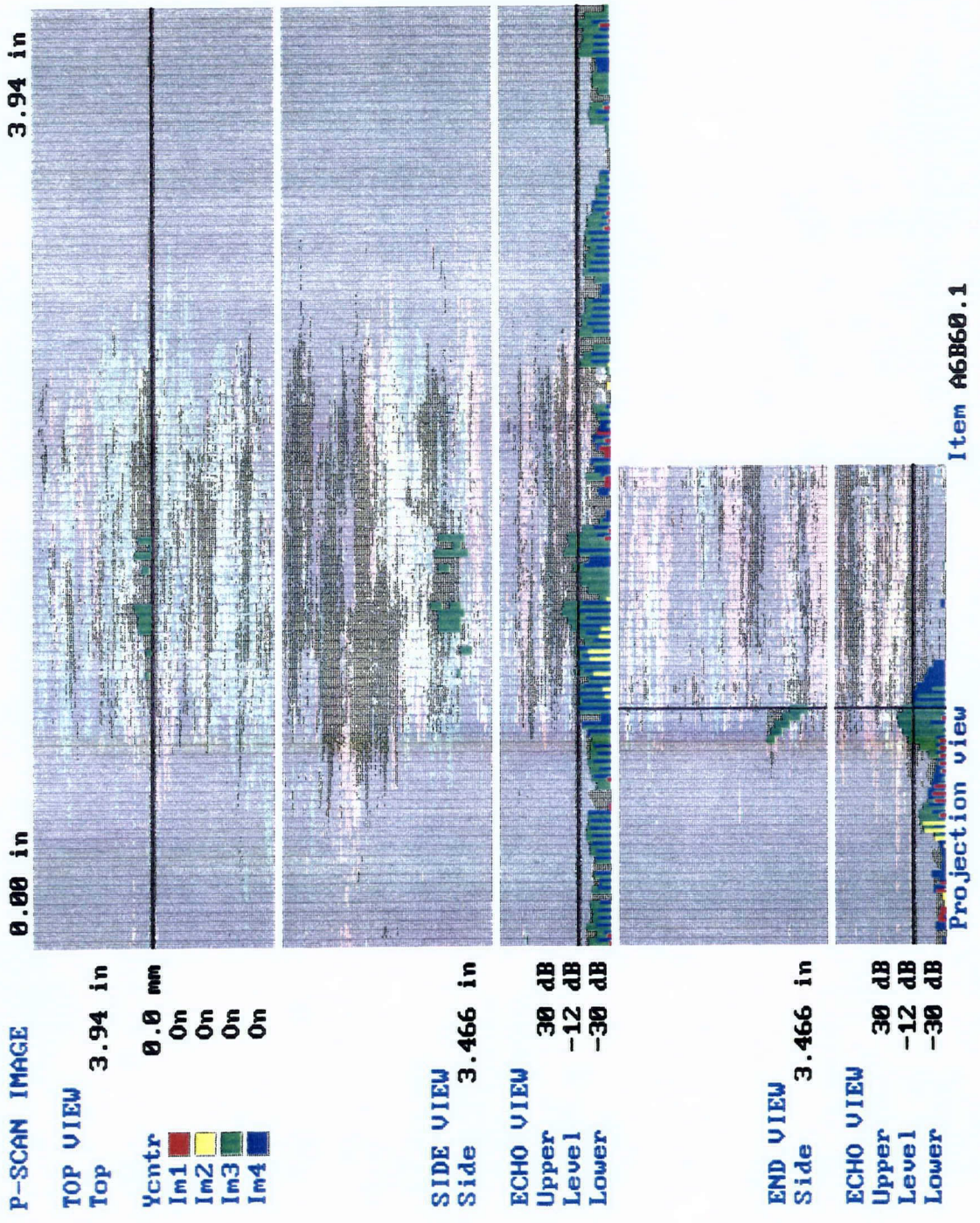


Reviewed by : Y. Khan UT-III Date : 12/07/93

12/8/93

SG-A /#5

Indication #6
Image at -12 dB (25% DAC)



Reviewed by : Y. Khan UT-III Date : 12/07/93

Y. Khan 12/8/93

SIEMENS

PERSONAL RESUME PROFILE

NAME: James E. Smedley

SOCIAL SECURITY #: 410-80-6112

FORMAL EDUCATION: University of Tennessee - Business Administration, 1974-1975; Cleveland State Community College - Business Administration, 1969-1971; Ooltewah High School, Ooltewah, TN - Diploma, 1967

ADDITIONAL TRAINING: See Below

TRAINING COURSE	HOURS	DATE	EMPLOYER/SCHOOL
UT I	21	12/74	Combustion Engineering
UT II	21	06/75	Combustion Engineering
PT I	4	05/75	Combustion Engineering
PT II	6	05/76	Combustion Engineering
MT II	40	03/84	TVA
MT II	32	12/86	TVA
PT II	36	11/83	TVA
PT II	32	10/86	TVA
VT II	24	08/87	TVA
VT II	36	05/87	TVA
VT II	56	05/84	TVA
UT II	80	11/83	TVA
UT II	32	12/83	TVA
UT II	48	12/86	TVA
QA/QC Mechanical	88	02/84	TVA
Q/C General Training	30.5	09/87	TVA
UT IGSCC Detection	40	04/84	EPRI NDE Center
UT Weld Overlay	32	05/86	EPRI NDE Center
UT IGSCC Sizing	40	02/89	EPRI NDE Center
Contract Management	16	05/89	Bechtel Construction, Inc.
Reactor/Vessel Visual	2	10/89	Universal Testing Laboratories
Rees Camera System	8	10/89	Rees Instruments, Inc.
UT CGWT	8	09/87	TVA
Visual Examination	7	10/89	Universal Testing Laboratories
P-Scan Operator Training/Rev. 1	160	02/90	Universal Testing Laboratories
UT Manipulator Operator/Operating Procedure Set up Training	102	03/90	Siemens
Phased Array Ultrasonic Testing	280	09/90	Universal Testing Laboratories
UT - P-Scan System	40	06/91	Swain NDT Technology Center
MT II	2	12/91	Siemens Nuclear Power Services, Inc.
PT II	2	12/91	Siemens Nuclear Power Services, Inc.
UT II	4	12/91	Siemens Nuclear Power Services, Inc.
P-Scan - Specific	4	04/92	Siemens Nuclear Power Services, Inc.

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
08/02/88	Present	UT, MT, PT Level II UT IGSCC Detect. UT IGSCC Overlay UT Level IIA	Siemens Power Corporation NDE Technician assigned to the Chattanooga, Tennessee Office. 11/30/92 - 12/22/92 Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT on feedwater and CRDU nozzles using the phased array UT system. Duties included establishing inspection parameters using the 3D modeling program for nozzle inspections (CATS); data collection and check for acceptance. Documentation of final report, and performance of NRC requested TGC verification. 04/20/92 - 04/30/92 Assigned to H. B. Robinson, Hartsville, SC to perform automated ultrasonic examinations. 05/05/91 HRD Reactor located in Karlstein, Germany. Performed phased array examination on the "F" and "S" nozzles to detect thermal fatigue cracks located in the inner radius (area 1) area of the nozzles. Performed analysis to locate and size all defects. 02/21/91 - 03/03/91 Assigned to GPU Nuclear Oyster Creek Nuclear Plant to perform data acquisition. Performed phased array examinations on CRDR nozzle. 10/10/90 - 11/19/90 Assigned to Cleveland Electric Illuminating, Perry Nuclear Plant for UT examination utilizing phased array

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			evaluation on reactor vessel/recir. safe end indications utilizing the L-SAFT system. 11/14/88 - 11/23/88 Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT on feedwater nozzles using the phased array UT system and mechanized inspection system. 10/10/88 - 10/28/88 Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT on reactor vessel/feedwater safe ends using USD-10. 9/19/88 - 10/1/88 Assigned to South Carolina Electric and Gas Company, V. C. Summer Unit 1. NDE Technician. Performed Section XI visual examinations. 8/28/88 - 9/9/88 Assigned to Niagara Mohawk Power Corporation, Nine Mile Point Unit 1. Performed UT document review.
05/07/88	08/01/88		Unemployed
04/29/88	05/06/88	UT, PT Level II	Combustion Engineering NDE Field Inspector - Assigned to Penelec Utility, Keystone 1 Appalachian Power Corporation, Louisa, KY - Performed UT and MT on hot reheat piping systems.
04/18/88	04/28/88		Unemployed

NAME: James E. Smedley SOCIAL SECURITY #: 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION

technology on seven (7) nozzles, in accordance with ASME XI, Reg Guide 1.150 and NUREG 0619. Duties included establishing procedure for job; Preparation of inspection parameters using the 3D modeling program for nozzle examination (CATS); Data collection and check for acceptance; Data evaluation on site; Documentation of final report on MacIntosh computer.

10/18/89 - 10/25/89
Furnas - Angra Nuclear Power Plant - Section XI VT examination on RPV upper internals utilizing remote underwater equipment.

06/16/89 - 07/10/89
Ringhals Nuclear Power Plant - Performed UT on reactor coolant narrow groove welds, main steam, feedwater, and instrumentation lines during steam generator replacement utilizing USD-10 ultrasonic instrument.

03/27/89 - 03/31/89
04/03/89 - 04/07/89
Utility Power Corp. - Grand Gulf - KWU Turbine work - MT and PT. Approximately 49 hrs.

02/08/89 - 02/12/89
Assigned to CP & L Corporation, Brunswick Steam Electrical Plant. Performed UT evaluation on overlay reactor vessel/recir. safe end of IGSCC indications, utilizing mechanized scanner and USD-10 UT instrument.

12/7/88 - 12/15/88
Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT.

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
03/27/88	04/17/88	UT, PT Level II	Combustion Engineering NDE Field Inspector. Utilized PT and UT on high energy piping systems.
11/26/87	03/26/88		Unemployed
05/83	11/25/87	See Description	Tennessee Valley Authority Nondestructive Testing Inspector. Supervisor of ten to fifteen inspectors. Liaison between the NRC and ANI. Lead responsibility for review of Watts Bar Nuclear Plant pre-service data. Conducted initial training and operation of Virginia Corporation at Richmond automated ultrasonic testing at Browns Ferry Nuclear Plant, Unit 2 for detection of IGSCC. Training Coordinator of nondestructive examination classes through TVA Nuclear Training Branch. Gave pre-certification nondestructive examination classes to trainees. Performed UT on PPV closure head bolts. Level II - Electric Power Research Institute, Charlotte, NC for detection of Intergranular Stress Corrosion Cracking (IGSCC). Level II - Electric Power Research Institute, Charlotte, NC for Detection of Intergranular Stress Corrosion Cracking through Overlay. Level II - Tennessee Valley Authority for ultrasonic testing.

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			Level II - Tennessee Valley Authority for liquid penetrant testing. Level II - Tennessee Valley Authority for magnetic particle testing. Level II - Tennessee Valley Authority for visual Section XI. Turbine Experience: MT on turbine diaphragms at Brown's Ferry NPS (June 1983) - 2 days Underwater Visual: Underwater visual at Brown's Ferry Nuclear Plant (Novemb er 1985)
10/02/82	05/11/83		Unemployed
1974	10/01/82	PT, MT, UT Level II	Combustion Engineering Inspector for Quality Control. Nondestructive and dimensional examinations of components for fossil fuel and nuclear power systems. performed inspection of nuclear waste containers. Served as liaison between manufacturing and contract inspectors and DCAS (government inspectors). Qualifications: Level II of ASNT Navy Nuclear Penetrant Testing. Level II of ASNT Magnetic Particle Testing, Spark Testing and Boroscope. Familiarity with reading x-ray films.

NAME: James E. Smedley

SOCIAL SECURITY #: 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
1975	1980	UT Level II	Industrial Laboratories (PART-TIME) Level II ASNT Consultant. Ultrasonic examination of various metal components; i.e., structural steel for bridges for Mississippi Valley Steel, steam dry rollers for Lucey Boiler, steam dry rollers for Tennessee Paper Mills and machine wheel drums for Dodge, Inc.

The employee signature for original resume is on file.

Sandra K. Brewitt
Siemens Power Corporation

8/10/93
Date

SIEMENS

NDE QUALIFICATION RECORD

___ **Initial Certification** _X_ **Recertification**

NAME: James E. Smedley **SOCIAL SECURITY NUMBER:** 410-80-6112

METHOD: Ultrasonics **CERTIFICATION LEVEL:** Level II

CERTIFICATION DATE: December 17, 1991 **EXPIRATION DATE:** December 3, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

GENERAL	SPECIFIC	PRACTICAL	COMPOSITE
DATE 12/04/91	DATE 12/04/91	DATE 12/17/91	95.1%
SCORE 92.5%	SCORE 100.0%	SCORE 93.0%	
[.3]*	[.3]*	[.4]*	

*Percentile Weight

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____
Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

SPECIALIZED NDE QUALIFICATION ENDORSEMENT

___ Initial Certification _X_ Recertification

NAME: James E. Smedley SOCIAL SECURITY NUMBER: 410-80-6112

METHOD: P-Scan Data Acquisition and Analysis

CERTIFICATION LEVEL II CERTIFICATION DATE 09/10/93 EXPIRATION DATE 9/09/96

EXAMINATION RESULTS:

SPECIFIC	PRACTICAL
DATE 09/10/93	DATE 09/10/93
PERCENT 90.0%	PERCENT 95.0%

NOTE: *No percentile weight factor is used to determine an endorsement. The only requirement is a minimum of 80% on both the specific and practical examinations.*

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____
Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

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Tel: (615) 499-0961
Fax: (615) 894-2456

CERTIFICATE OF EYE EXAMINATION

NAME James Sinclair SOCIAL SECURITY NUMBER 410-48-6110

EXAMINATION DATE 11-11-92

EXAMINATION CONDUCTED SHALL INCLUDE THE FOLLOWING:

NEAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ]

Natural or corrected near distance acuity in at least one eye to J-1 at not less than 12 inches (30.5 cm). Ortho Rater number ten (10) test pattern shall also be acceptable.

Jaeger 1+

Corrective Lenses Required Yes [✓] No [ ]

FAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ]

Natural or corrected far distance acuity in at least one eye to Titmus Snellen test equivalent of 20/30.

Corrective Lenses Required Yes [ ] No [✓]

COLOR VISION

Acceptable Yes [✓] No [ ]

Satisfactory color vision as demonstrated by Ishihara Test patterns or equivalent.

Gloria J Stott R.T. 11-11-92

Examiner's Signature Date

Gloria J Stott R.T.

Examiner's Name (Please Print)

PLEASE RETURN TO:

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

REVISED 07/18/91

SIEMENS

PERSONAL RESUME PROFILE

NAME: Yousuf A. Khan

SOCIAL SECURITY #: 099-64-9683

FORMAL EDUCATION: University of Karachi (Pakistan) - B. S. Degree in Physics, 1967.

ADDITIONAL TRAINING: See Below

TRAINING COURSE	HOURS	DATE	EMPLOYER/SCHOOL
Advanced Industrial Radiography Training	200	04/68	Atomic Energy Centre
UT, MT, PT	120 EA.	07/68	Vitosonics Ltd., England
UT IGSCC Detection	64	06/88	EPRI
Radiation Safety	40	11/81	Tech/Ops, Burlington, MA
RT, UT, PT	40 EA.		Alliance Tool Corp.
P-Scan Operator Training/Rev. 1	160	02/90	Universal Testing Laboratories
Operator UT Manipulator/ Manipulator Operating Procedures Training	90	03/90	Siemens
Phased Array Ultrasonics Testing Training	272	09/90	Universal Testing Laboratories

Siemens Power Corporation

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Chattanooga, TN 37421

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PERSONAL RESUME PROFILE (CONTINUED)

NAME: Yousuf A. Khan

SOCIAL SECURITY #: 099-64-9683

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
05/16/88	Present	RT, UT Level III RSO Phased Array UT	Siemens Power Corporation 12/01/92 - 12/22/92 Assigned to GPUN Oyster Creek Plant for Phased Array Ultrasonic inspections of four FW and one CRDRL nozzles in accordance with NUREG 0619. Duties included job preparation, design and manufacturing of all robotic tooling to realize the automated ultrasonic inspection. Also provided UT Lead Level III support. 04/20/92 - 04/30/92 Assigned to H.B. Robinson, Hartsville, SC to perform automated ultrasonic examinations. 02/22/91 - 02/28/91 Assigned to Oyster Creek Nuclear Station. 10/10/90 - 11/17/90 Assigned to Cleveland Electric Illuminating, Perry Nuclear Plant for CEI - UT examination utilizing phased array technology on seven (7) nozzles, in accordance with ASME XI, Reg Guide 1.150 and NUREG 0619. Duties included job preparation and scheduling; preparation of inspection parameters and data collection and check for acceptance. 05/16/88 - 10/09/90 Assigned to Corporate Offices as Radiation Safety Officer.

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Yousuf A. Khan **SOCIAL SECURITY #:** 099-64-9683

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			Responsible for the functional operation of the Radiation Safety Program and the management of the technical and administrative tasks encompassing the program. Responsible for the training and certification of RT personnel. Part of the team responsible for Americanization of Phased Array UT Technology. Developed procedure for Phased Array UT of BWR F/W Nozzles at Oyster Creek and Perry I. Developed scan plans and other nozzle specific data required for Phased Array examination of BWR F/W Nozzles at Oyster Creek and Perry.
04/13/88	05/15/88		Employment Change
04/08/86	04/12/88	UT, PT, Examiner Level III MIL-STD-2132 (Navy Nuclear)	Monroe Forgings Rochester, NY - Supervision and manual performance of ultrasonic, dye-penetrant and visual inspection of high temperature alloy forgings, in three different stages: in-process, as-forged and machines. Components manufactured for civil and military aircraft engines and nuclear submarines.
10/85	04/86		Unemployed

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Yousuf A. Khan **SOCIAL SECURITY #:** 099-64-9683

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
08/81	10/85	RT, PT, UT Level II	Alliance Tool Corporation Radiographics both X-ray and Gamma Ray. Ultrasonic, both contact and immersion, in addition to dye penetrant inspection of a wide variety of weldments, castings and forgings.
01/81	08/81		Immigration
04/74	01/81		Karachi Gas Company, Inc. Karachi, Pakistan - Managed the construction and nondestructive inspection of natural gas distribution mains, in both urban and rural areas.
07/15/69	04/74	RT, UT, MT, PT, Hydraulic Testing	Suparco Karachi, Pakistan - Performed and supervised radiographic, ultrasonic, magnetic, hydraulic and dye tests of weather rocket components.
02/21/68	05/31/69	RT, MT, UT, PT	Inspection & Reclamation Services, Inc. West Wharf Karachi, Pakistan - Performed RT, MT, PT, UT and gas pipeline and ships in dry docks.

The employee signature for original resume is on file.

Siemens Power Corporation

8/10/93
Date

SIEMENS

NDE QUALIFICATION RECORD

__ Initial Certification X Recertification

NAME: Yousuf A. Kahn SOCIAL SECURITY NUMBER: 099-64-9683

METHOD: Ultrasonics CERTIFICATION LEVEL: Level III

CERTIFICATION DATE: April 13, 1992 EXPIRATION DATE: August 4, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

BASIC	METHOD	SPECIFIC	COMPOSITE
DATE 08/05/91	DATE 04/13/92	DATE 04/13/92	
SCORE 97.7%	SCORE 88.0%	SCORE 94.2%	92.4%
[.33]*	[.33]*	[.33]*	

*Percentile Weight

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____

Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

SPECIALIZED NDE QUALIFICATION ENDORSEMENT

___ Initial Certification __X__ Recertification

NAME: Yousuf A. Kahn SOCIAL SECURITY NUMBER: 099-64-9683

METHOD: P-Scan Data Acquisition and Analysis

CERTIFICATION LEVEL II CERTIFICATION DATE 09/10/93 EXPIRATION DATE 09/09/96

EXAMINATION RESULTS:

SPECIFIC	PRACTICAL
DATE 09/10/93	DATE 09/10/93
PERCENT 90.0%	PERCENT 89.0%

NOTE: *No percentile weight factor is used to determine an endorsement. The only requirement is a minimum of 80% on both the specific and practical examinations.*

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____
Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

NDE CERTIFICATION RECORD

____ Initial Certification (SNPS) X Recertification

NAME: Yousuf A. Khan **SOCIAL SECURITY NUMBER:** 099-64-9683

METHOD: Radiography **CERTIFICATION LEVEL:** Level III

CERTIFICATION DATE: August 5, 1991 **EXPIRATION DATE:** June 12, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

BASIC	METHOD	SPECIFIC	COMPOSITE
DATE 08/05/91	DATE 06/13/91	DATE 06/13/91	
SCORE 97.7%	SCORE 83.0% *	SCORE 89.0% *	89.9%

COMMENTS:

* Exams administered by Hellier Associates, Inc.

EDUCATION, EXPERIENCE AND TRAINING:

The SNPS Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SNPS's Chattanooga office and may be reviewed or audited by appropriate indivdiuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Nuclear Power Services, Inc. certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SNPS-QAP-02.6 and is hereby certified to the level listed.

Dan K. Perry
Quality Assurance, Manager

Jeffery L. Landrum
Manager, Training & Certification

RT-101

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531 Chattanooga, TN 37421 TEL: (615) 499-0961 FAX: (615) 894-2456

CERTIFICATE OF EYE EXAMINATION

NAME Yousaf, Khan SOCIAL SECURITY NUMBER 099-64-9683

EXAMINATION DATE 8/10/93

EXAMINATION CONDUCTED SHALL INCLUDE THE FOLLOWING:

NEAR DISTANCE ACUITY J-1+

Acceptable Yes [✓] No [ ] *Natural or corrected near distance acuity in at least one eye to J-1 at not less than 12 inches (30.5 cm). Ortho Rater number ten (10) test pattern shall also be acceptable.*

Corrective Lenses Required Yes [✓] No [ ]

FAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ] *Natural or corrected far distance acuity in at least one eye to Titmus Snellen test equivalent of 20/30.*

Corrective Lenses Required Yes [✓] No [ ]

COLOR VISION

Acceptable Yes [✓] No [ ] *Satisfactory color vision as demonstrated by Ishihara Test patterns or equivalent.*

Marty Massengale
Examiner's Signature

8/10/93
Date

MARTY MASSENGALE
Examiner's Name (Please Print)

PLEASE RETURN TO:

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

REVISED 07/18/91

SIEMENS

PERSONAL RESUME PROFILE

NAME: Philip G. Shamblin

SOCIAL SECURITY #: 408-90-9339

FORMAL EDUCATION: University of Tennessee, Knoxville, TN - 1969 - 1972;
Tennessee Wesleyan College, Athens, TN - 1972;
Hiwassee College, Madisonville, TN - Summer, 1970

ADDITIONAL TRAINING: See Below

TRAINING COURSE	HOURS	DATE	EMPLOYER/SCHOOL
UT I & II	152	08/85	TVA
UT IGSCC Detection	32	08/84	TVA
UT IGSCC Detection	64	10/86	TVA
RT MINAC IGSCC	40	06/86	EPRI
UT IGSCC Sizing	40	02/89	EPRI
UT IGSCC Sizing	32	02/91	EPRI
UT Weld Overlay Training	32	08/90	EPRI
UT I Nozzle Inner Rad	14		Nuclear Energy Services
PT I & II	74	05/87	TVA
MT I & II	56	03/85	TVA
RT I	40	03/85	TVA
VT Section XI	104	07/84	TVA
Intro to NDE	40		TVA
Visual Welding Inspection	40	04/84	TVA
RT	16	03/86	TVA
RT (MINAC Radiography)	32		Arnold Engineering
Mechanical	40	12/84	TVA
QC	30.5	08/87	TVA
USD-10	24	10/87	TVA
Contract Management	16	05/89	Bechtel Construction, Inc.
P-Scan Training	160	11/89	Universal Testing Laboratories
Rees Camera System	8	10/89	Rees Instruments, Inc.
IGSCC Detection Manual/P-Scan	160	02/91	Universal Testing Laboratories
VT 1-4	4	05/91	Universal Testing Laboratories
UT	2	09/91	Siemens Nuclear Power Services
Phased Array Ultrasonic Testing	80	12/94	Siemens Nuclear Power Services

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

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Fax: (615) 894-2456

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
01/16/89	Present	MT, PT, UT, VT-1 Level II UT Level IIA	Siemens Power Corporation 11/04/92 - 01/15/93 Assigned to Taiwan Power Company as shift leader for P-Scan automated ultrasonic system. Responsible for all activities associated with the P-Scan system, including final analysis for data collected. Also responsible for all manual ultrasonic review. 03/08/92 - 05/08/92 Assigned to Perry Nuclear Plant as day shift leader for the P-Scan automated system. Responsible for all activities associated with the P-Scan system including personnel work assignments, craft support and all coordination with plant management to assure compliance with work activities and schedules. Also responsible for data collection and preliminary analysis with the P-Scan. 02/23/92 - 02/28/92 Assigned to North Anna Nuclear Plant. Performed ultrasonic testing for steam generator replacement. 10/06/91 - 11/08/91 Assigned to Hatch Nuclear Plant to perform automated ultrasonic examination utilizing P-Scan for detection of IGSCC in piping and pipe overlays, and manual IGSCC sizing. 08/04/91 - 08/12/91 Assigned to Kernkraftwerk Leibstadt AG Nuclear Plant, Switzerland - Sized crack on recirculation system piping.

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION

05/16/91 - 06/01/91
Assigned to Pilgrim Nuclear Power Plant to perform visual examination, utilizing pipe crawler, on service water system.

03/24/91 - 04/19/91
Assigned to Plant Hatch, Southern Company Services to perform UT examinations on nozzle welds utilizing P-Scan automated equipment.

02/22/91 - 03/10/91
Assigned to Oyster Creek Nuclear Station.

09/04/90 - 11/14/90
Assigned to Cleveland Electric Illuminating Co., Perry Nuclear Plant. Performed MT, PT and UT examinations on various piping systems, RPV head and nozzles in the plant. Most of the examinations were concentrated on nozzle examinations utilizing the P-Scan automated system.

05/07/90 - 05/17/90
Supported KWU during the TVO refueling outage in Ol Killioto, Finland. Performed automated (P-Scan) ultrasonic examinations on circumferential and meridional welds on the reactor pressure vessel head. Performed fluorescent MT of RPV circumferential weld.

03/27/90 - 04/06/90
Assigned to Utility Power Corp. to perform UT, PT and MT on turbine at Waterford I.

02/11/90 - 03/10/90
Certification on P-Scan System at EPRI; IGSCC Sizing and Weld Overlay.

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			11/12/89 - 11/16/89 Certification on P-Scan system at EPRI; IGSCC Detection. 08/14/89 -08/18/89 Assigned to Gaithersburg, MD office to compose technical descriptions of NDE for bid proposals. 07/17/89 - 07/21/89 Assigned to Utility Power Corporation - Comanche Peak to perform PT. 05/21/89 - 05/25/89 Florida Power Corporation - Performed UT and MT at Higgins and Bartow Power Plants. 04/03/89 - 04/07/89 and 03/27/89 - 03/31/89 Utility Power Corporation, Grand Gulf - KWU turbine work MT and PT. 02/14/89 - 02/22/89 Assigned to Pepco to perform UT examinations at Morgantown Plant.
11/28/88	01/12/89	UT IGSCC Level II	Nuclear Energy Services Nine Mile I, Niagara Mohawk Power Corp. - Performed IGSCC UT inspection on piping and components.
11/09/88	11/27/88		Unemployed
10/03/88	11/08/88	UT Level II IGSCC	Universal Testing Laboratories, Inc. Assigned to South Carolina Electric & Gas, VC Summer Nuclear Power Plant - Performed IGSCC detection.

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
08/05/88	10/02/88		Unemployed
01/27/88	08/04/88	UT Level II IGSCC	Nuclear Energy Services Nine Mile II, Niagara Mohawk Power Corp. Performed ultrasonics on plant piping and components.
11/26/87	01/26/88		Unemployed
12/20/83	11/25/87	UT, VT, PT, MT, RT Level II	Tennessee Valley Authority Division of Nuclear Power, Chattanooga, TN Performed nondestructive examinations on nuclear related components. Worked and coordinated activities of NDE inspection in order to perform examinations required to assure absence of generic problems that have an impact on the plant operation. This includes verification that qualification of personnel, equipment and procedures are in all types of NDE work to conform to NRC requirements.
12/82	12/83		Ted Russell Ford Knoxville, TN - Salesman
12/72	12/82		Shamblin Appliance & Furniture Co. Madisonville, TN - Owner - Sales, Service

The employee signature for original resume is on file.

Sandra K. Brewbaker
Siemens Power Corporation

8/16/93
Date

SIEMENS

NDE QUALIFICATION RECORD

___ Initial Certification X Recertification

NAME: Philip G. Shamblin SOCIAL SECURITY NUMBER: 408-90-9339

METHOD: Ultrasonics CERTIFICATION LEVEL: Level II

CERTIFICATION DATE: September 4, 1991 EXPIRATION DATE: August 29, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

GENERAL	SPECIFIC	PRACTICAL	COMPOSITE
DATE 08/30/91	DATE 09/04/91	DATE 09/04/91	92.8%
SCORE 97.5%	SCORE 96.0%	SCORE 85.0%	
[.3]*	[.3]*	[.4]*	

*Percentile Weight

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____

Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

SPECIALIZED NDE QUALIFICATION ENDORSEMENT

____ Initial Certification X Recertification

NAME: Philip G. Shamblin SOCIAL SECURITY NUMBER: 408-90-9339

METHOD: P-Scan Data Acquisition and Analysis

CERTIFICATION LEVEL II CERTIFICATION DATE 09/10/93 EXPIRATION DATE 09/09/96

EXAMINATION RESULTS:

SPECIFIC	PRACTICAL
DATE 09/10/93	DATE 09/10/93
PERCENT 100%	PERCENT 94%

NOTE: *No percentile weight factor is used to determine an endorsement. The only requirement is a minimum of 80% on both the specific and practical examinations.*

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____
Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

CERTIFICATE OF EYE EXAMINATION

NAME Philip STANSLIN SOCIAL SECURITY NUMBER 408-90-9339

EXAMINATION DATE 10/12/92

EXAMINATION CONDUCTED SHALL INCLUDE THE FOLLOWING:

NEAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ] *Natural or corrected near distance acuity in at least one eye to J-1 at not less than 12 inches (30.5 cm). Ortho Rater number ten (10) test pattern shall also be acceptable.*

Corrective Lenses Required Yes [ ] No [✓]

FAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ] *Natural or corrected far distance acuity in at least one eye to Titmus Snellen test equivalent of 20/30.*

Corrective Lenses Required Yes [ ] No [✓]

COLOR VISION

Acceptable Yes [✓] No [ ] *Satisfactory color vision as demonstrated by Ishihara Test patterns or equivalent.*

[signature]
Examiner's Signature

10/12/92
Date

DR GEOFFREY CROFF
Examiner's Name (Please Print)

PLEASE RETURN TO:

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

REVISED 07/18/91

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1233

SYSTEM LINEARITY REQUIREMENTS UTILIZING THE P-SCAN PSP-3

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9/1/93

Expiration Date 2/28/94

RECOMMENDED BY: _____ 8/23/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 24AUG93
Manager ~~-~~ Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 13	0

SIEMENS NUCLEAR POWER SERVICES, INC.

ENGINEERED INSPECTION SERVICES

TITLE: SYSTEM LINEARITY REQUIREMENTS UTILIZING THE P-SCAN PSP-3

PROCEDURE NO. SNPS-AUT-17, Revision 1

CONTROLLED COPY
NUMBER 10

PROCEDURE PREPARED BY: _____ DATE 3-5-92

PROCEDURE REVIEWED BY: _____ LEVEL III DATE 3-9-92

QUALITY ASSURANCE REVIEW: _____ DATE 3/10/92

DEPARTMENT MANAGEMENT APPROVAL: _____ DATE 3/10/92

PROPRIETARY INFORMATION NOTICE

REVISION HISTORY LOG

Revision No.	Date	Page(s)	Description
0	04-20-90	All	Initial issue.
1	03-10-92	All	Name change to reflect SNPS; word change in section 5.4.1.1

TABLE OF CONTENTS

1.0 PURPOSE

1.1 The purpose of this procedure is to describe the technique used for the automated P-Scan system with respect to:

1.1.1 Screen Height Linearity

1.1.2 Amplitude Control Linearity

2.0 SCOPE

2.1 Linearity checks utilizing the P-Scan PSP-3 system.

3.0 REFERENCES

3.1 ASME Boiler and Pressure Vessel Code (B &PV Code) Section V, Subsection A, Article 4, Appendices I and II.

3.2 ASME Boiler and Pressure Vessel Code (B &PV Code) Section XI, 1986 Edition.

4.0 PERSONNEL QUALIFICATION

4.1 Personnel performing ultrasonic examinations in accordance with this procedure shall be qualified and certified to the requirements of the following references:

4.1.1 SNPS-QAP-02.6, "Qualification and Certification Requirements of Nondestructive Examination Personnel".

4.1.2 Specific operator training for use and handling of the P-Scan System.

5.0 EQUIPMENT

5.1 The P-Scan, PSP-3 has an integrated pulse-echo ultrasonic instrument, having the capability of generating and receiving frequencies of 1 to 5 MHz and a logarithmic dynamic range of 120 db.

5.2 The presentation of the A-Scan is visible on the PSP-3 screen display.

5.3 The PSP-3 is provided with capabilities for the recording of digitized A-Scans in a single file on the diskette. Due to the high sample rate - 32 Mega

Samples Per Second (MSPS) - a very detailed echo pattern is obtained, allowing non-rectified (RF) echo signals to be recorded and reconstructed.

5.4 The ultrasonic instrument shall be calibrated to meet the linearity requirements of ASME Code Section V.

5.4.1 Cables

5.4.1.1 The length of the coaxial cables should not exceed 75 yards.

5.4.1.2 If greater distance is required, cables must be tested to ensure no unallowable loss of amplitude.

5.4.2 Calibration Block

5.4.2.1 The IIW calibration block or similar reference block with two reflectors shall be used.

5.4.3 Couplant

5.4.3.1 Water, USP grade glycerine or commercially available couplants shall be used for calibration and examination as approved by the client.

5.4.3.2 Couplants shall be certified for total sulfur and halogen content in accordance with ASTM D-129-064 and ASTM D-808-81. The total residual halogen and sulfur shall not exceed 250 ppm by weight.

5.4.4 Search Units

5.4.4.1 Search units may contain either single or dual transducer elements.

5.4.4.2 Transducer size shall be in the range of 0.125" to 1.00", either round or square.

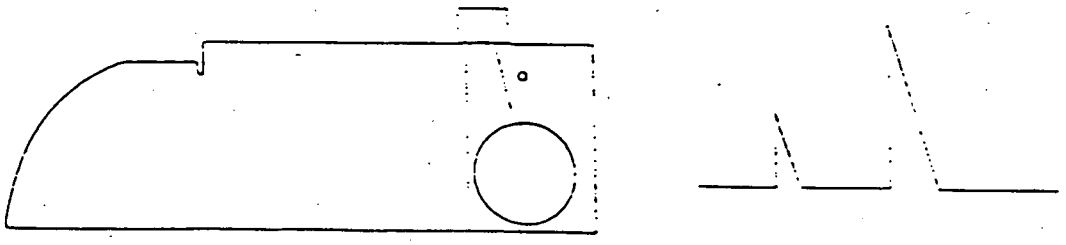
6.0 CALIBRATION REQUIREMENTS

6.1 Instrument calibration for screen height and amplitude control linearity shall be verified at the beginning and end of the weld examinations performed during one outage.

6.1.1 Screen Height Linearity

6.1.1.1 The ultrasonic instrument shall provide screen height linearity within 5% of full range for at least 80% of the Full Screen Height (FSH) (baseline to maximum calibrated screen points).

6.1.1.2 To verify the ability of the ultrasonic instrument to meet the linearity requirements of Reference 6.1.1.1, position a straight beam search unit as shown in Figure 1 so that echoes can be observed from two reflectors in the calibration block.



IIW Calibration Block
Figure 1

This situation is required in the Screen Height Linearity test whereas the amplitude control linearity requires only one echo. The above set-up, however is useful for both of the required tests.

6.1.1.3 Recall File TSTASMIP from the disk TSTPAR. Remove the test disk and insert a new formatted disk. Connect the probe to Jack T/RI and place the probe on the IIW block as shown in Figure 1. Go to the A-Scan recording menu and press "CONT" (Start).

By moving the probe and using the adjust (ATOPL) control, obtain two echos with a ratio of 1 to 2 with the second echo at 80% FSH. Press "REC" to store the initial A-Scan in the memory. By means of the level control, adjust the gain to set the larger echo from 100% to 20% FSH in 10% increments and read

the amplitude of the smaller echo at each setting. The reading shall be 50% of the larger echo, within ± 5% FSH. Recall the notebook parameters menu and enter the readings as illustrated in Figure 2. Go to the disk/print/aux menu and save the results on the disk.

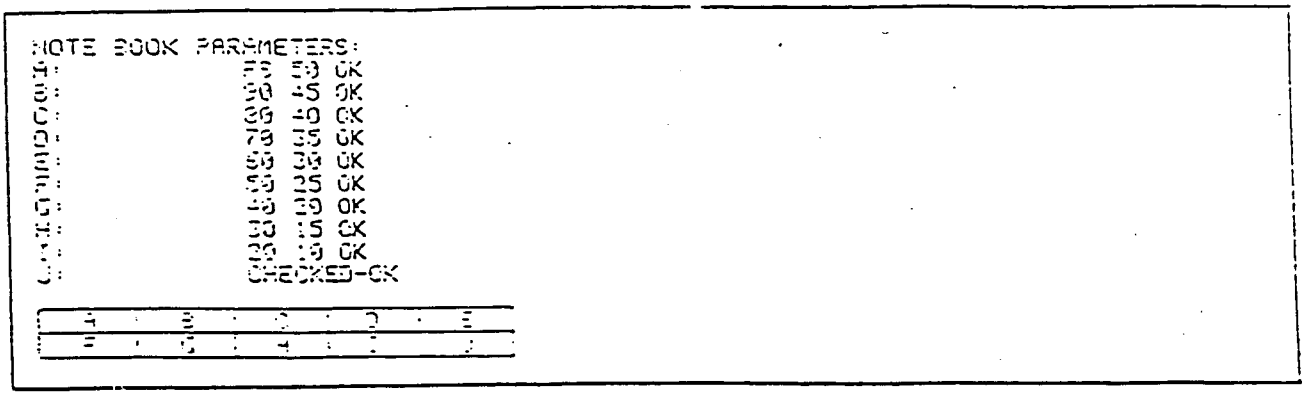


Figure 2

6.1.2 Amplitude Control Linearity

6.1.2.1 The ultrasonic instrument shall utilize an amplitude control accurate over its useful range to ± 20% of the nominal amplitude ratio, to allow measurement of indications beyond the linear range of the vertical display on the screen.

6.1.2.2 Recall file TSTASM2P from the disk TSTPAR. Remove the test disk and insert disk used for screen height linearity test. Following the same steps as in 6.1.1.3, set the higher amplitude at 80% FSH. Record the dB setting. Press REC to store the initial A-Scan in the memory with the increases and decreases in the dB level as shown in Table 1, the echo amplitude shall fall within the specified limits.

TABLE 1

Specified Limits For Echo Amplitude

Amplitude Setting	Level dB Change	Amplitude Required
80	+ 6	32 to 48
80	+ 12	16 to 24
40	- 6	64 to 96
20	- 12	64 to 96

Recall the notebook parameters menu and enter the readings as illustrated in Figure 3. Go to the Disk/Print/Aux menu and save the results on the disk.

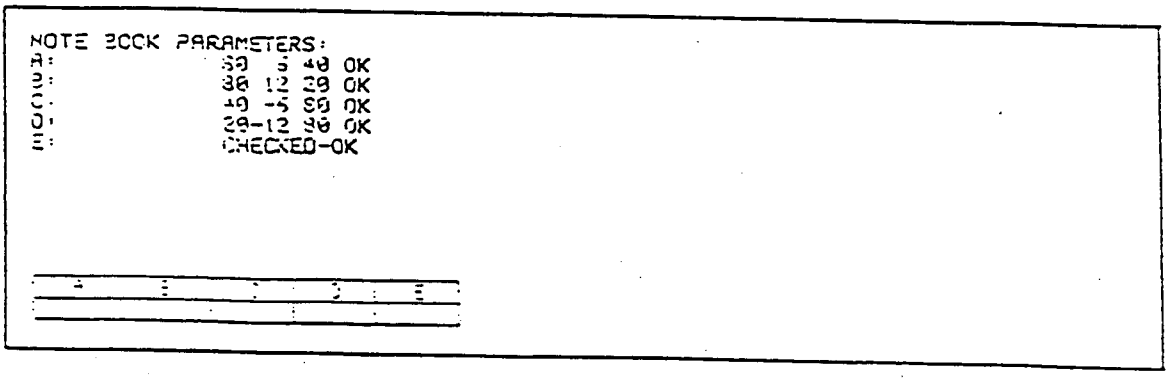


Figure 3

7.0 RECORDS AND REPORTS

7.1 Linearity results are stored on data disks, however, hard copies are available upon request from the client.

8.0 APPENDICES

None.

9.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1234

DETECTION AND DISCRIMINATION OF REFLECTORS IN CARBON STEEL PRESSURE VESSELS AND COMPONENTS UTILIZING P-SCAN (PSP-3)

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9|8|93

Expiration Date 3|7|94

RECOMMENDED BY: _____ 8/20/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 30AUG93
Manager - Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 16	0

SIEMENS NUCLEAR POWER SERVICES, INC.

ENGINEERED INSPECTION SERVICES

TITLE: DETECTION AND DISCRIMINATION OF REFLECTORS IN CARBON STEEL PRESSURE VESSELS AND COMPONENTS UTILIZING P-SCAN (PSP-3)

PROCEDURE NO. SNPS-AUT-20, Rev. 0

JOB SPECIFIC: CP&L (H. B. Robinson)

CONTROLLED COPY
NUMBER 10

PROCEDURE PREPARED BY: _____ DATE 3-9-92

PROCEDURE REVIEWED BY: _____ Level III DATE 3-9-92

QUALITY ASSURANCE REVIEW: _____ DATE 3/10/92

DEPARTMENT MANAGEMENT APPROVAL: _____ DATE 3/10/92

PROPRIETARY INFORMATION NOTICE

REVISION HISTORY LOG

Revision No.	Date	Page(s)	Description
0	03-10-92	All	Initial issue.

TABLE OF CONTENTS

1.0 PURPOSE

1.1 The purpose of this procedure is to establish techniques for the mechanical/semi-automated detection and discrimination of reflectors in carbon steel pressure vessels and components.

2.0 SCOPE

2.1 This procedure covers carbon steel ranging in size from 1.0" wall, up to and including 6" wall.

2.2 All inspection is performed from the outer surface of the component.

3.0 REFERENCES

3.1 SNPS-QAP-2.6, "Qualification and Certification requirement of Nondestructive Examination Personnel".

3.2 SNPS-AUT-17, "System Linearity Requirements Utilizing the P-Scan PSP-3".

3.3 ASME Boiler and Pressure Vessel Code (B and PV Code)

3.3.1 ASME B & PV Code, Section XI, Rules for Inservice Inspection of NPP Components, 1986 Edition, Summer 1986 Addenda and applicable code cases.

3.3.2 ASME B & PV Code, Section V, Nondestructive Examination, 1974 and later Edition and Addenda.

4.0 PERSONNEL QUALIFICATION

4.1 Personnel performing ultrasonic testing (UT) detection and discrimination according to this procedure shall be qualified and certified to the requirements of the following references:

4.1.1 Personnel performing UT detection and discrimination shall be qualified and certified as a Level II or Level III in accordance with the recommendations of SNT-TC-1A.

4.1.2 Personnel performing UT detection and discrimination shall be qualified and certified in accordance with the reference 3.1.

5.0 EQUIPMENT

5.1 Manipulator Equipment

5.1.1 Mechanical/semi-automatic devices are temporarily attached to the outside surface of the component adjacent to the weld or area to be inspected. This device facilitates meandric movement of the search units and a definite angular skew. The direction and pattern of the movement is predetermined in order to maintain complete coverage of the volume to be examined.

5.2 Micro-Computer

5.2.1 A micro-computer will be utilized to handle all data of the search units.

5.2.2 The data are displayed as Top, Side, End and Echo views.

5.3 UT System

5.3.1 The P-Scan, PSP-3 has an integrated pulse-echo ultrasonic instrument, having the capability of generating and receiving frequency of 1 to 5 MHz and a logarithmic dynamic range of 120 db.

5.3.2 The presentation of the A-Scan is visible on the PSP-3 screen display.

5.3.3 The PSP-3 is provided with facilities for the recording of digitized A-Scans in a single file on the diskette. Due to the high sample rate -32 Mega Samples Per Second (MSPS) - a very detailed echo pattern is obtained, allowing non-rectified (RF) echo signals to be recorded and reconstructed.

5.3.4 The ultrasonic instrument shall be calibrated to meet the linearity requirements of ASME Code Section V. This requirement will be done in accordance with SNPS-AUT-17, "System Linearity Requirements Utilizing the P-Scan PSP-3".

5.4 Cables

5.4.1 The length of the coaxial cables should not exceed 65 yards.

5.4.2 If greater distance is required, cables must be tested to ensure no unallowable loss of amplitude.

5.5 Calibration Block

5.5.1 The basic calibration block shall be manufactured in accordance with the applicable edition and addenda of Section XI of the ASME B & PV Code.

5.5.2 The surface finish of all blocks shall be representative of the surface finish of the component to be examined.

5.5.3 Material Specification

5.5.3.1 Calibration blocks shall be fabricated from the same or acoustically similar material as the item being examined.

5.5.3.2 If material of the same specification is not available, material of similar chemical analysis, tensile properties and metallurgical structure may be used.

5.6 Couplant

5.6.1 Water, USP grade glycerine or commercially available couplants shall be used for calibration and examination as approved by the client.

5.6.2 Couplants shall be certified for total sulfur and halogen content in accordance with ASTM D-129-64 and ASTM D-808-81. The total residual halogen and sulfur shall not exceed 250 ppm by weight.

5.7 Search Units

5.7.1 Single or dual transducer elements may be employed in search units.

5.7.1.1 Transducers shall have a nominal frequency range of 1.0 MHz to 5.0 MHz for both shear and longitudinal wave mode application.

5.7.1.2 Transducers may be self contained units or used in conjunction with wedges.

5.7.1.3 The transducer element size shall be suited to the item being inspected.

5.7.2 For the use of the corner effect the search unit shall contain a wedge to produce shear waves at a nominal angle within the range of 38 to 52 degrees. In the case of ID geometric irregularities (e.g., mismatch/counterbore) different probe angles up to 70° may be used.

5.7.3 For the use of the mode conversion technique, a nominal angle of incidence of approximately 70° longitudinal mode is preferable.

5.7.4 In those cases where complete coverage of weld and heat affected zone due to crown width is not possible, or where detection and discrimination is questionable, additional search units with higher probe angles shall be employed.

5.7.5 For determining the weld profile and wall thickness a straight beam probe may be used.

5.7.6 Calibration shall be performed with search units used to perform examination.

6.0 CALIBRATION

6.1 Calibration shall include the complete ultrasonic examination system. Any change in search units, shoes, couplants, cables, ultrasonic instruments, recording devices, or any other parts of the examination system shall be cause for a calibration check. The initial calibration shall be performed on the basic calibration block. Calibration checks may be performed on the basic calibration block, or simulator blocks, but must include a check of the entire examination system.

6.2 For contact examination, the difference in temperature of the part to be examined and the calibration block to be used, shall not exceed $\pm$25°F (14°C).

6.3 Calibration shall be performed from the surface of the calibration block which corresponds to the component surface to be examined.

6.4 Instrument calibration for screen height linearity and amplitude control linearity shall be verified and recorded at the beginning and at the end of the examinations at the job site and at intervals not to exceed three months.

6.4.1 The ultrasonic instrument shall provide screen height linearity within 5% of full screen height (FSH).

6.4.1.1 To verify the ability of the ultrasonic instrument to meet the linearity requirements, a check shall be performed. This requirement will be done in accordance with SNPS-AUT-17, "System Linearity Requirements Utilizing the P-Scan, PSP-3".

6.4.2 The ultrasonic instrument shall utilize an amplitude control, accurate over its useful range to +/-20% of the nominal amplitude ratio.

6.4.2.1 To verify the ability of the ultrasonic instrument to meet the linearity requirements, a check shall be performed. This requirement will be done in accordance with SNPS-AUT-17, "System Linearity Requirements Utilizing the P-Scan PSP-3".

6.5 Prior to performing system calibration, the search unit exit point, beam angle (nominal angle) and time of flight in the wedge (Index) shall be measured, which provides the calibration for the instruments sweep (metalpath or time of flight calibration). This shall be verified using an appropriate reference block. The readings shall be recorded on applicable forms.

6.6 The maximum amplitude of calibration reflectors shall be obtained with the sound beam oriented perpendicular to the axis of the calibration reflector. The center line of the search unit shall be at least 3/4" (19 mm) from the nearest side of the block or component. Rotation of beam into a corner formed by the reflector and the side of the block may produce higher amplitude signals at longer beam path. This beam path shall not be used for calibration.

6.6.1 Calibration reflectors such as ID/OD - notches and/or side drilled holes shall serve to establish the distance amplitude correction.

6.6.2 The primary reference level will be used for data evaluation/presentation. The evaluation shall be done down to noise level.

6.7 A system calibration check, which is the verification of the instrument sensitivity and sweep range calibration, shall be performed:

6.7.1 At the beginning and the end of the examination.

6.7.2 A calibration check on at least one of the basic reflectors in the basic calibration block or a check using a simulator shall be made every 12 hours during the exams.

6.7.3 If any part of the Ultrasonic equipment is changed such as cables, transducers, wedges or the PSP-3.

6.7.4 If any point of the DAC has decreased 20% or 2dB of its amplitude, all data sheets since the last system calibration check shall be marked "void". A new calibration shall be made and recorded. The voided examination areas shall be re-examined.

6.7.5 If any point of the DAC has increased 20% or 2dB of its amplitude, recorded indications taken since the last valid calibration or system calibration check may be re-examined with the correct calibration and their values changed on the data sheets.

6.7.6 If any point on the DAC has moved on the sweep line more than 10% of the sweep division reading, correct the sweep range calibration and note the correction in the examination record. If recordable indications are noted on the data sheets, those sheets shall be voided, a new calibration shall be performed and the applicable examination areas shall be re-examined.

7.0 EXAMINATION

7.1 Surface Conditions

7.1.1 The examination surface shall be free of irregularities loose materials, or coatings which interfere with ultrasonic wave transmission.

7.2 Scanning Speed

7.2.1 Scanning speed shall not exceed 6" per second and slower scanning speeds may be applied.

7.3 Coverage

7.3.1 To assure complete coverage of the examination area, each pass of the search unit shall overlapped 50% of the search unit's width.

7.4 Inspection Techniques

7.4.1 The standard technique to detect reflectors shall be the corner effect method, using 45° shear-wave transducer.

7.4.2 The mode conversion technique may serve for initial detection and discrimination of reflectors having an ID connection.

7.4.3 Supplemental transducers for verification and/or classification of indications and/or their origin may be used.

7.5 Scanning for Reflectors

7.5.1 Prior to the examination the actual profile of the area to be examined shall be determined or profiles taken from prior exams shall be used.

7.5.2 The time of flight gate setting and the scanned surface area should cover the entire examination volumes, if practical. In case of limitations due to access conditions, additional UT techniques may be used, if applicable and meaningful.

7.5.3 To detect reflectors oriented parallel to the weld, the search unit shall be positioned about 90° to the weld and manipulated laterally and longitudinally so that the beam passes through all the required examination volume. Scanning for reflectors oriented parallel to the weld may be performed with two different UT techniques, (i.e., corner effect technique and mode conversion technique), if feasible, from both sides of the weld if no access limitations are provided.

7.6 Details of Inspection

All parameters for data acquisition and evaluation shall be recorded with each specific data file during examination. This includes:

7.6.1 Material Parameters

7.6.1.1 Sound Velocity

7.6.1.2 Sound Attenuation

7.6.1.3 Wall Thickness

7.6.1.4 Diameter

7.6.1.5 Main Zone Dimension (area of interest)

7.6.1.6 Gate Settings

7.6.2 Search Unit Parameters

7.6.2.1 Angle of incidence

7.6.2.2 Metal equivalent wedge delay time

7.6.2.3 Frequency

7.6.3 Inspection Parameters

7.6.3.1 Distance of sound beam exit points of both search units, (if two search units are employed).

7.6.3.2 Direction of search unit beam relative to reference point location.

7.7 Scanning Restrictions

7.7.1 In cases where the use of mechanical/semi-automatic devices is not possible due to limited access or other scanning restrictions, manual scanning may also be employed.

7.7.2 Scanning limitations shall be recorded (area & type of obstruction) on applicable form in UT-inspection report.

8.0 EVALUATION OF INDICATIONS

8.1 Discrimination

To discriminate between geometric indications originating from the ID of the component and relevant indications, the evaluation of the indication pattern, displayed in top, side- and end- view, (considering the sound field characteristics of the UT technique used), and the amplitude criteria, serve to determine character and origin of the indication signal. All signals exceeding the noise level shall be evaluated and discriminated.

9.0 RECORDING OF INDICATIONS AND REPORTS

9.1 All data is recorded on floppy disks and is reproducible in form of colored hard copies.

9.1.1 All indications are displayed in a manner which allows the operator to evaluate their position in relationship to the weld, their depth location and their amplitude.

9.1.2 Indications, -6dB of the primary reference level or as written in the applied scan plans, are recorded by the operator on applicable forms in the Ultrasonic Inspection Report.

9.1.2.1 The signal shall be evaluated by adjusting the maximum amplitude of the indication to the primary reference level.

9.1.2.2 The linear extent is determined by adjusting the evaluation level at primary reference level -6dB and reading start and end of the indication from the top view presentation.

9.1.2.3 In the case that a low signal noise ratio does not permit an evaluation of the indication length according to paragraph 9.1.2.2, the evaluation level shall be adjusted to just above the noise level.

9.1.2.4 Indications with amplitudes below the primary reference level that are suspected to be of cracking origin, shall be evaluated just above the noise level.

9.1.2.5 The axial location of the indication is indicated by the position of maximum signal amplitude. The circumferential position is indicated by the cursor information. Lateral position can be interpreted from the top and/or end view.

9.1.3 Documentation includes, but is not limited to:

9.1.3.1 Hard copy print out of examination results.

9.1.3.2 Detailed report of findings.

9.1.3.3 Calibration record.

9.1.3.4 Record of recheck data.

9.1.3.5 List of areas examined.

10.0 APPENDICES

None

11.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

17 1993

REQUEST FOR ENGINEERING TASK FORM - H B ROBINSON

ATTACHMENT A

Date: 9/16/93

MEMORANDUM TO: NED Site Unit Manager / BM C.A. Jones

FROM: Technical Support Unit Manager

SUBJECT: Release for Engineering Task RET-RG93-GQ [redacted]

TITLE/SCOPE: ISI SUPPORT DISCREPANCY RESOLUTION

REQUIRED COMPLETION DATE: 10/31/93 CHARGE NUMBER:

MAN-HOURS AUTHORIZED: 250 MAPS NUMBER: RET-RG93-GQ

PRIORITY: 4

PLANT CONTACT: Dick Weber (RET Initiator)

Please provide the following:			
	Scope & Cost Estimate (SCE)		Comment Resolution/Proposed Reso. (CP/PR)
	Design Doc. Rev/Aorvt (DDR/A)		Mod Package (MP); PCN Required
	Procedure Review (PR)		Field Revision (FR); PCN Required
	Engineering Evaluation (EE)		Temporary Mod (TM)
	Calculation (C)		Temporary Mod Field Field Revision (TMFR)
	Other Resolve discrepancies on supports documented on VT-3 inspection reports. Scope includes EE's, technical eval., calcs, etc. as required to disposition discrepancies		

APPROVAL: [signature] (Technical Support Unit Manager)

Pages Attached: None

PCN: N/A ☒ PCN Number:

RETURN MEMORANDUM TO: Technical Support Unit Manager Date: 11/9/93

FROM: Don Dyksterhouse (NED Unit Manager) NOV 22 1993

RESPONSE
- ____ The completed original is attached.
- X The work is complete (see comments).
- ____ RET Cancelled (see comments).

Comments: All items received were resolved by 10/22/93 10/22/93 Summary Status Report and the NED Tracking Report

ASSIGNED ENGINEER: C.A. Jones

NED UNIT MANAGER: [signature]

cc: Mr. H. A. Dapper (w/o attachments)
NED Site Unit Manager
Dick Weber (Plant Contact)

CLOSEOUT SUMMARY FOR
RET-RG93-GQ
ISI SUPPORT DISCREPANCY RESOLUTION

There were 116 supports that were inspected via VT-3 during the Refuel 15 ISI inspections. This included four supports that were inspected that were not scheduled for this outage. Of this number 39 had recordable indications or discrepancies that required NED resolution. All 39 discrepancy reports were resolved by 10/22/93. Of the 39 discrepancies 22 were found to be acceptable as is. Fourteen were evaluated as functional as is but minor repairs recommended. Three were found to be functional using short term qualification criteria and required repairs prescribed for long term service. There were no discrepancies found and evaluated that resulted in any supports being declared dysfunctional, therefore there was no increase in sample inspections. All the recommended and required repairs were completed via Work Tickets issued by Tech Support prior to the plant crossing 200 deg. No systems had to be taken out of service in order to complete the repairs. Most of the repairs and discrepancies involved loose or missing locknuts, lack of spring can settings markers, or lack of full thread engagements.

There were five drawings that required updating to correct drafting or field note errors to resolve the recorded discrepancy. These corrections are being completed as part of the closeout of PCN-92-094/00 since they are corrections to the A/E prepared As-Builts. The drawing discrepancies do not represent a field or ISI problem.

Total NED expenditures on the RET were less than 170 manhours according to the 11/17/93 MAPS Report. This does not include the efforts in obtaining and preparing As-Built drawings. Those are charged to the PCN listed above. Attached is a copy of the last Daily Status Summary for the NED ISI Support. Also attached is the final NED ISI Tracking System Report that has the tracking info on all the supports for which NED supplied drawings, VT-3 results, and disposition of discrepancies.

The 39 of 116 supports with disrepancies found during RF 15 is a significant improvement on the 189 discrepancies on 225 supports inspected during RF 14. This is due in part to the concerted effort to find as well as generate As-built drawings prior to the inspection. Many of the discrepancy issues during RF 14 were attributable to lack of drawings. Another positive contributing factor was the acceptance criteria provided to the inspectors. Resolution turn around was greatly enhanced by having NDE/ISI send each support with an indication report to NED via its own site memo as generated rather than lumped into masses. Another improvement was having a better set of Stress isos available. Availability of the Stress calcs onsite and better reveiw of the Stress isos can improve this even more. It is recommended that the identification of supports requiring inspections in RFO 16 & 17 be done well in advance of RFO 16 to allow for adequate field checks and document searches to produce the correct drawings at the right time.

October 22, 1993

NED ISI SUPPORT

DAILY STATUS SUMMARY

	TODAY	TOTAL
Support Drawings Required	-	106
Expanded Scope	0	0
Existing Drawings	-	45
Existing Drawings Provided To ISI	-	45
NUS-Field As Builts Required	-	66
NUS-Field As Builts Completed	-	66
NUS-Drawings Released To NED	-	66
New Drawings Released To ISI	-	66
Discrepancy Reports Received	-	39
Discrepancy Reports Resolved	3	39
Dysfunctional Supports	0	0
Supports Receiving VT-3 Inspections	-	*116
VT-3 Inspections Completed	-	116

* Includes three supports inspected that were not scheduled for this outage and six supports for which the drawings are in vendor Tech Manuals(RCP's,SG's,PZR) and one VT-3 on Strut noted by NRC inspector as slightly damaged.

COMMENTS: Engineering disposition of discrepancies for all supports in RF 15 Section IX scope has been completed. Corrective repairs are in progress. None of the repairs require the support or line to be considered out of service to complete. Of the 39 indications resolved, 22 were acceptable as is, 14 were functional but corrective repairs were recommended, and 3 were functional short-term but repairs required for long term service. At least 5 of the As-Built drawings by NUS will require revision to correct drawing discrepancies between field condition and the drawing.

NUCLEAR ENG[redacted]NG DEPARTMENT
H. B. ROBINSON ISI TRACKING SYSTEM

SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
B-2-119	00/00/00	00/00/00	10/21/93	Y	TSE-93-EM	10/21/93	10/22/93	Exist. dwg B-2-219 provided; Bent end rod on SGB strut noted by NRC inspector was not part of scheduled ISI scope for RF15; Support functional as is but recommend replacing rod
CPL-108-A	00/00/00	09/17/93	10/02/93	N	----	----	----	Existing drawing RC-10-H4 transmitted to ISI
CPL-109-C	00/00/00	00/00/00	09/24/93	Y	TSE-93-CC	09/25/93	10/19/93	SI-3/3135 1)excessive clearance pipe clearance is ok 2) lack of full thread engagement ok on one, remove extra washers & torque on other 3) loose anchor bolt ok per drawing; Drawing to be revised by NED on washers
CPL-110-C	09/22/93	10/06/93	10/01/93	N	----	----	----	
CPL-110-D	09/14/93	09/29/93	09/21/93	Y	TSE-93-CA	09/23/93	09/29/93	Load bolt on pipe clamp for deadwt w/ spring can lacks one thread of full engagement; Support is functional as is; Tighten bolt to full engagement not to exceed MMM-016 torque values. Line 10-SI-47
CPL-116-E	00/00/00	00/00/00	10/08/93	Y	TSE-93-CZ	10/12/93	10/20/93	Existing drawing RC-3-180 provided preoutage; Support is functional short-term; Missing shim to be replaced to closeup clearance gap
CPL-116-Y	00/00/00	10/01/93	10/21/93	N	----	----	----	Existing drawing RC-3-2403 located and provided to ISI after field verification and checking of Stress iso vs. ISI iso indicates that RC-3-170 drawing provided preoutage is not the correct support
CPL-1168-E	09/21/93	***	10/10/93	N	----	----	----	NUS drawing will not be issued; Support is seismic,.RC-3-143; ***Drawing requested from Raleigh but it is not available; Inspectors used unsigned NUS drawing
CPL-122A-W	00/00/00	00/00/00	09/23/93	N	----	----	----	Existing drawing CH-5-209 provided preoutage

NUCLEAR ENGINEERING DEPARTMENT
H. B. ROBINSON ISI TRACKING SYSTEM

SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-123-BB	00/00/00	00/00/00	09/22/93	Y	TSE-93-CB	09/23/93	09/29/93	Support was not scheduled for ISI inspection this outage but was misidentified by NDE as CPL-123-EE and inspected; Missing jamb nut to be replaced; Support is functional as is
CPL-123-DD	00/00/00	00/00/00	09/22/93	N	----	----	----	Existing drawing CH-13-14/4 provided preoutage
CPL-123-EE	00/00/00	00/00/00	09/25/93	N	----	----	----	Existing drawing CH-13-14/5 provided preoutage
CPL-123-FF	09/16/93	10/06/93	09/24/93	N	----	----	----	
CPL-123A-O	09/28/93	10/06/93	10/08/93	N	----	----	----	CH-4-H5 (6033) on Stress iso.; 3-CH-15A is supported on multigang hanger CH-11/N-11 which also provides support for 2-SI-63 (CPL-247-F) and 2-CH-15-B (CPL-143-H1)
CPL-123A-OO	09/28/93	10/12/93	10/10/93	N	----	----	----	Deadweight support not modelled on CH-4 Stress iso
CPL-123A-P	00/00/00	00/00/00	10/09/93	N	----	----	----	Existing drawing CH-4-32 provided preoutage
CPL-123A-Q	00/00/00	00/00/00	10/04/93	N	----	----	----	CH-4-SN-24 Snubber #24 drawing provided to IST preoutage.
CPL-124-G	09/27/93	10/06/93	10/08/93	N	----	----	----	SK-1104-C-1193; 3-CH-15A is supported on multigang hanger AC-9-H17 & AC-9-H6
CPL-124-H	09/22/93	10/06/93	10/08/93	N	----	----	----	SK-1104-C-1192; CH-4-H8 (6044) on Stress iso; 3-CH-15A is supported on multigang hanger AC-9-H7 & AC-9-1002
CPL-124-I	00/00/00	00/00/00	10/05/93	Y	TSE-93-CM	10/06/93	10/09/93	Support is acceptable as is; Existing drawing CH-4-42 provided preoutage; Pipe clearance deviations
CPL-124-J	00/00/00	00/00/00	10/05/93	N	----	----	----	CH-4-SN-23 Snubber #23 drawing provided to IST proutage. Inspection is part of EST-033 testing

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SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-124-N	00/00/00	00/00/00	10/05/93	Y	TSE-93-CU	10/07/93	10/09/93	Support was not scheduled for inspection this outage but was misidentified in field by inspectors due to discrepancies on the ISI isos; Support is acceptable as is
CPL-125-A	00/00/00	00/00/00	10/05/93	Y	TSE-93-CQ	10/06/93	10/14/93	Existing drawing CH-7-710 provided preoutage; Gap under lower edge of baseplate & gap under upper bolt head;Support is functional short-term; Bolts to be tightened to eliminate gaps
CPL-125-B	00/00/00	00/00/00	09/22/93	N	----	----	----	Existing drawing CH-7-901 provided preoutage
CPL-125-C	00/00/00	00/00/00	09/22/93	N	----	----	----	Existing drawing CH-7-9 provided preoutage
CPL-125-D	09/27/93	10/12/93	10/10/93	Y	TSE-93-EC	10/12/93	10/16/93	Clevis in field but pipe clamp on drawing; Support in field is acceptable as is; Drawing to be revised
CPL-134-A	09/23/93	10/06/93	10/07/93	N	----	----	----	
CPL-134-AA	09/23/93	10/06/93	10/07/93	N	----	----	----	
CPL-134-B	09/23/93	10/06/93	10/07/93	N	----	----	----	
CPL-134-C	09/23/93	10/06/93	10/07/93	N	----	----	----	
CPL-142-A	09/27/93	10/12/93	10/11/93	Y	TSE-93-CW	10/12/93	10/19/93	Gap under base plate; Support is functional; Recommend torquing bolts to 40-45 FT.LBS
CPL-142-B	00/00/00	00/00/00	10/05/93	N	----	----	----	Existing drawing SI-1-76 provided preoutage
CPL-143-A	00/00/00	00/00/00	09/28/93	N	----	----	----	Existing drawing CH-4-80 provided preoutage
CPL-143-B	00/00/00	00/00/00	09/25/93	Y	TSE-93-CV	10/12/93	10/20/93	Existing drawing CH-4-SN25 provided preoutage; Small saw cut in top of weld; Support is functional; Recommended weld repair per CWM

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SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-143-H	09/17/93	10/06/93	10/07/93	Y	TSE-93-ED	10/12/93	10/19/93	Exist. dwg. CH-4-96 provided rather than issue of NUS dwg. Support is acceptable as is; Gap is along a jog in concrete surface where joint in concrete forms deflected during construction;It is outside bolt lines
CPL-143-H1	09/17/93	10/06/93	10/08/93	Y	TSE-93-EA	10/12/93	10/16/93	2-CH-15B is on multigang hanger detailed on CH-11/N-11 which also supports 2-SI-63 (CPL-247-F) & 3-CH-15A (CPL-123A-O); Loose U-bolt was snugged up and locknuts added in cleanup of M-1104 work on supp.
CPL-143-H2	09/17/93	***	10/10/93	N	----	----	----	Existing dwg CH-4-102 was found and provided post mortem; NUS drawing will not be issued as an approved drawing
CPL-143-K	09/22/93	10/12/93	10/10/93	N	----	----	----	
CPL-143-L	09/22/93	***	10/10/93	Y	TSE-93-EB	10/12/93	10/19/93	U-bolt missing nuts; Support is not on Stress iso; NUS drawing will not be issued approved due to indeterminate Safety Related vs. Non-Safety Related status of support & drawing;Support is functional as DW
CPL-143-M	09/24/93	10/12/93	10/10/93	N	----	----	----	Existing drawing RC-3-117 found and provided rather than issue of NUS As-Built
CPL-143-N	09/24/93	10/06/93	10/07/93	Y	TSE-93-EI	10/12/93	10/14/93	Missing nut; Support is functional short-term; Replace missing nut
CPL-212-A	00/00/00	00/00/00	10/08/93	N	----	----	----	Existing drawing MS-1A-1023 provided preoutage
CPL-212-B	09/29/93	10/12/93	10/10/93	N	----	----	----	
CPL-212-C	09/13/93	09/29/93	10/05/93	N	----	----	----	26-MS-1;
CPL-212-F	00/00/00	00/00/00	10/05/93	N	----	----	----	Existing drawing MS-1A-1913 provided preoutage

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SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-213-A	09/21/93	10/06/93	10/07/93	Y	TSE-93-EE DF 12/12/94	10/12/93	10/14/93	Loose nuts; No HL/CL settings on spring can; Support is functional as is; Tighten nuts and replace missing washers
CPL-213-C	09/13/93	09/29/93	10/02/93	Y	TSE-93-CJ	10/05/93	10/21/93	26-MS-1 Acceptable as is
CPL-213-E	00/00/00	00/00/00	10/05/93	Y	TSE-93-CP	10/06/93	10/07/93	Existing drawing MS-1B-1003 provided preoutage; Pipe lateral lug clearances; Support is acceptable as is;
CPL-214-A	00/00/00	00/00/00	10/07/93	N	----	----	----	Existing drawing MS-1C-1062 provided preoutage
CPL-214-B	09/20/93	10/06/93	10/07/93	N	----	----	----	
CPL-214-C1	09/14/93	10/06/93	10/07/93	N	----	----	----	
CPL-214-Q	09/14/93	09/29/93	10/05/93	N	----	----	----	
CPL-215-D	09/14/93	09/29/93	10/07/93	Y	TSE-93-EK	10/12/93	10/16/93	HL/CL settings do not match drawing; Support is acceptable as is; Drawing to be revised
CPL-215-H	00/00/00	00/00/00	10/07/93	N	----	----	----	Existing drawing FW-5A-22 provided preoutage
CPL-215-I	09/14/93	09/29/93	10/07/93	N	----	----	----	
CPL-215-J	00/00/00	00/00/00	09/30/93	Y	TSE-93-CD	10/01/93	10/06/93	Existing drawing FW-5A-20 provided preoutage; Excessive pipe lug clearances and warped flanges on support members; Support field checked 10/02/93; Support acceptable as is
CPL-215-J1	09/14/93	09/29/93	09/30/93	Y	TSE-93-CE	10/01/93	10/07/93	Deadwt support with extra lock nut on one rod and loose washer plates on U-bolt; Support field checked 10/02/93; Support is acceptable as is
CPL-216-G	00/00/00	00/00/00	10/07/93	Y	TSE-93-EG	10/12/93	10/14/93	Existing drawing FW-5B-1034 provided preoutage; Clearances; Support is acceptable as is

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SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-216-I	09/29/93	10/12/93	10/10/93	N	----	----	----	
CPL-217-D	00/00/00	00/00/00	09/21/93	N	----	----	----	Existing drawing FW-5C-67 provided preoutage
CPL-217-G	09/14/93	09/29/93	10/01/93	N	----	----	----	
CPL-217-J	09/14/93	09/29/93	10/01/93	N	----	----	----	
CPL-218-A	09/17/93	09/29/93	09/14/93	Y	TSE-93-CH	10/05/93	10/20/93	Thread engagement,load setting justoff scale; Support is functional; Recommend tightening bolt to acchieve full thread engagement; Spring can is in mid range of travel at cold condition ok
CPL-218-B	09/17/93	09/29/93	09/13/93	N	----	----	----	
CPL-218-C	09/16/93	10/12/93	09/13/93	N	----	----	----	
CPL-218-D	09/16/93	09/29/93	09/13/93	Y	TSE-93-CK	10/05/93	10/22/93	Warped rod; Missing clamp bolt on three bolt pipe clamp; Support is functional, recommend missing bolt, nut, washer, and spacer be replaced
CPL-218-P	00/00/00	00/00/00	09/13/93	N	----	----	----	Existing drawing SI-3-3045 provided preoutage
CPL-219-A	09/18/93	09/29/93	10/02/93	Y	TSE-93-CI	10/05/93	10/21/93	Missing locknuts on spring cans; Support is acceptable as is
CPL-219-B	09/18/93	09/29/93	10/02/93	N	----	----	----	
CPL-219-C	09/18/93	09/29/93	10/03/93	Y	TSE-93-CL	10/05/93	10/08/93	Loose lock nut; Support functional, Tightening of nuts recommended
CPL-219-D	09/18/93	09/29/93	10/02/93	N	----	----	----	
CPL-219-H	00/00/00	00/00/00	09/13/93	N	----	----	----	Existing drawing SI-2-1366 provided preoutage
CPL-219A-O	00/00/00	00/00/00	10/10/93	Y	TSE-93-CY	10/12/93	10/13/93	Existing drawing SI-2-412 provided preoutage; Clearances; Support is acceptable as is

NUCLEAR ENG[illegible]ING DEPARTMENT
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SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-219A-P	09/20/93	10/12/93	10/10/93	Y	TSE-93-CX	10/12/93	10/19/93	Missing locknuts on deadweight support; Support is functional as is; Recommend adding locknuts to snug tight but may be added below load nuts rather than above support channels; Stake threads as option
CPL-232A-A	09/17/93	09/29/93	10/08/93	N	----	----	----	
CPL-232A-B	09/18/93	09/29/93	10/11/93	N	----	----	----	
CPL-232A-C	09/20/93	10/06/93	10/08/93	N	----	----	----	
CPL-234B-A	09/17/93	10/06/93	10/06/93	N	----	----	----	
CPL-234B-B	09/18/93	09/29/93	10/05/93	Y	TSE-93-CN	10/06/93	10/09/93	Pipe clearances; Support acceptable as is is; Drawing requires revision to show 0" bottom clearance***
CPL-234B-C	09/18/93	09/29/93	10/05/93	N	----	----	----	
CPL-234B-D	09/20/93	10/06/93	10/05/93	N	----	----	----	
CPL-245-A	00/00/00	00/00/00	09/23/93	N	----	----	----	Existing drawing SI-6-N-2 provided preoutage
CPL-245-B	00/00/00	00/00/00	10/11/93	N	----	----	----	Existing drawing SI-6-46 provided preoutage
CPL-245-C1	09/21/93	10/12/93	10/14/93	N	----	----	----	Support C is considered inaccessible and no as-built will be issued; Support on vertical riser not on ISI miso found and existing drawing SI-6-41 provided to be added to program and inspected as C1
CPL-245-D	09/16/93	09/29/93	10/05/93	Y	TSE-93-CO	10/06/93	10/22/93	2-SI-63; Loose U-Bolt on 2-AC-40B which is on same support as 2-SI-63; Support is functional; Recommend replacing square nut wuith hex and torquing U-bolt; Line is a non-thermal analyzed line

NUCLEAR ENG[illegible]ING DEPARTMENT
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SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-245-E	09/16/93	09/30/93	10/04/93	N	----	----	----	SK-1104-C-1186; 2-SI-63 is supported on AC-8-310 multigang hanger; NUS provided field verification and markup of mod sketch 9/28/93; info copy issued to ISI which must get controlled copy from Mod Doc. Control
CPL-245-F	09/16/93	10/06/93	10/06/93	N	----	----	----	
CPL-245-G	09/16/93	09/30/93	10/04/93	N	----	----	----	SK-1104-C-1178;2-SI-63 is supported on AC-8-325 & AC-8-H6 multigang hanger; NUS provided field verification and markup of mod sketch;Info copy issued to ISI; Controlled copies from Mod Doc. Control
CPL-246-A	09/15/93	10/06/93	10/07/93	Y	TSE-93-EE	10/12/93	10/21/93	No HL/CL settings on spring can; Support is acceptable as is
CPL-246-B	09/16/93	10/06/93	10/06/93	N	----	----	----	
CPL-246-C	09/15/93	10/06/93	10/07/93	Y	TSE-93-EH	10/12/93	10/14/93	Loose nuts; bent rod; missing anchor bolt on VT-3 but the support inspected was actually CPL-245-G and the nuts were already tight when follow up on G was done; Actual CPL-245-C had no indications
CPL-246-D	00/00/00	00/00/00	09/28/93	N	----	----	----	Existing drawing SI-7-40 provided preoutage
CPL-246-E	09/15/93	09/30/93	10/04/93	N	----	----	----	SK-1104-C-1191; 2-SI-64 is suppported on AC-9-5522 & AC-9-8046 multigang hanger; NUS provided field verification & markup of mod sketch;Info copies provided to ISI;Controlled copies from Mod Doc. Control
CPL-246-G	----	----	10/21/93	Y	TSE-93-EN	10/21/93	10/21/93	Support was not scheduled for inspection this outage but was mistakenly inspected as CPL-245-C; Support is acceptable as is
CPL-247-A	09/17/93	10/12/93	10/10/93	N	----	----	----	Existing drawing SI-6-N1 found and provided rather than issue of NUS As-Built

SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-247-B	00/00/00	00/00/00	09/24/93	N	----	----	----	Existing drawing SI-6-77 provided preoutage
CPL-247-C	09/15/93	10/06/93	10/06/93	Y	TSE-93-CT	10/07/93	10/21/93	SK-1104-C-1169; 2-SI-63 is supported on multigang hanger AC-7-H4; Loose nuts on rod field checked 10/09/93; Support is functional short term; Tensioning of rod by tightening of nuts required
CPL-247-D	09/15/93	10/06/93	10/06/93	Y	TSE-93-CS	10/07/93	10/15/93	Field checked on 10/09/93; Ros has minor warping and is loose above spring can; No tagging on spring can Support is functional; Nuts should be tightened to tension the rod
CPL-247-E	00/00/00	00/00/00	09/24/93	N	----	----	----	Existing drawing SI-6-71 provided preoutage
CPL-247-F	09/15/93	10/06/93	10/08/93	N	----	----	----	2-si-63 is supported on multigang hanger CH-11/N-11
CPL-247-G	00/00/00	00/00/00	09/24/93	N	----	----	----	Existing drawing SI-6-69 provided preoutage
CPL-247-H	09/15/93	09/30/93	10/04/93	N	----	----	----	SK-1104-C-1173; 2-SI-63 is supported on AC-8-35/13 & AC-8-H18 multigang hanger; NUS provided field verification & markup of mod sketch;Info copies provided to ISI;Controlled copies from Mod Doc. Control
CPL-324-A	00/00/00	00/00/00	10/01/93	Y	TSE-93-CF	10/02/93	10/07/93	Existing drawing SW-7-24/11 provided preoutage; Support field checked 10/02/93; Support is acceptable as is
CPL-324-B	09/28/93	10/12/93	10/10/93	N	----	----	----	
CPL-324-C	00/00/00	00/00/00	10/01/93	Y	TSE-93-CG	10/02/93	10/07/93	Existing drawing SW-7-24/9 provided preoutage; Support field checked 10/02/93; Support is acceptable as is
CPL-324-D	09/16/93	10/06/93	10/07/93	Y	TSE-93-EJ	10/12/93	10/20/93	Loose and missing locknuts to be tightened and added if not already fixed by M-1113 which impacted this support during its implementation

NUCLEAR ENGINEERING DEPARTMENT
H. B. ROBINSON ISI TRACKING SYSTEM

SUPPORT #	FIELD AS-BUILT	DRAWINGS ISSUED	VT-3	DISCREPANCIES	SITE MEMO	DATE RECEIVED	DATE RESOLVED	COMMENTS
CPL-324D-Q	00/00/00	09/17/83	10/06/93	Y	TSE-93-CR	10/07/93	10/07/93	Existing drawing SW-4-40/6 transmitted to ISI; U-Bolt temporarily removed per M-1113
CPL-324D-S	00/00/00	10/06/93	10/08/93	N	----	----	----	Existing drawing SW-4-24/5A transmitted to ISI
CPL-324D-T	00/00/00	09/17/93	10/06/93	N	----	----	----	Existing drawing SW-4-6029 transmitted to ISI
CPL-324D-U	00/00/00	09/17/93	10/11/93	N	----	----	----	Existing drawing SW-4-40/5 transmitted to ISI

PRELIMINARY

October 6, 1993

To: Warren Farmer
From: Charlie Griffin
Subject: Evaluation of MT Indications on the Steam Generator B Primary Channel Head to the Tube Bundle

I went into containment and visually looked at the indications on SG "B" (the area had been marked by the NDE inspectors and the indications were visible to the naked eye). The indications appear to either be in the toe of the weld joint (base metal / weld metal fusion line) or slightly inside the weld toe (weld metal) (cannot determine exact location of the weld toe without acid etching since it has been ground smooth).

Indications appear to most likely be weld surface imperfections/ irregularities which were not completely removed by the ISI grinding/polishing operations during SG replacement activities (weld bead ridges/valleys, incomplete fusion between weld beads, undercut, etc.). Indications numbers 2-5 could likely be removed with very light polishing/filing/buffing (visually appear to be very minor and UT did not reveal any measurable depth). Indication number 1 may require slightly more buffing to remove, based on its appearance and the UT depth reading of approx. 0.15".

I made an attempt to review the ASME Code Section XI Acceptance Criteria to see if these could be resolved in a straight forward manner:

PRELIMINARY EVALUATION (WOULD NEED TO BE CHECKED/VERIFIED/REVIEWED):

IWB-3400 requires you to first "characterize" flaws using IWA-3300 to establish dimensions and then use those dimensions in determining the acceptability of the flaws relative to IWB-3500.

IWA-3300(a)(3) requires that the flaw aspect ratio (a/l) not exceed 0.5. Since UT could not measure any depth to indications numbers 2-5, if we assume the depth would not exceed 0.1" for each, all would meet this aspect ratio criteria. Based on the .15" depth measured for indication number 1, it too would meet this flaw aspect ratio criteria.

IWA-3300(b) requires flaws to be characterized in accordance with IWA-3310 through -3390.

* Flaw indications numbers 1, 2, and 3 **could** be considered multiple surface planar flaws and evaluated as one flaw based on individual flaw depths and separation (ligament between individual flaws) (Reference: IWA-3310(a), Figure IWA-3310-1, IWA-3330(a), and Figure IWA-3330-1). Total length (including ligaments) would be 1.25 inches long with an "a" dimension of 0.15". (Note: This flaw size of 1.25" length with "a" of 0.15" would still meet the flaw aspect ratio criteria of IWA-3300(a)(3).)

* Alternately, indications numbers 2 and 3 could be considered as surface "aligned linear flaws" (no measured depth) and evaluated as one flaw based on individual flaw separation (Reference: IWA-3400 and Figure IWA-3400-1). The total flaw length would be 0.65". In this case, indication number 1 would be considered a separate surface planar flaw with length of 0.4" and "a" of 0.15".

* Flaw indications numbers 4 and 5 would be considered as separate surface "aligned linear flaws" (no measured depth) and evaluated individually, based on flaw separation (Reference: IWA-3400 and Figure IWA-3400-1).

Based on acceptance criteria of IWB-3510.1 and Table IWB-3510-1 (assuming SG vessel wall thickness to be 5.25"):

* Indication number 1 would be acceptable (without further analysis), provided indications numbers 2 and 3 are considered separate "aligned linear flaws".

* Indications numbers 1, 2, and 3 would require further analysis to be accepted (IWB-3600 stress analysis) when considered as one surface planar flaw.

PRELIMINARY

Based on acceptance criteria of IWB-3510.3 and Table IWB-3510-3 (assuming SG vessel wall thickness to be 5.25"):

* Indications numbers 2, and 3 would require further analysis to be accepted (IWB-3600 stress analysis) when considered as one surface "aligned linear flaw".

* Indications numbers 4 and 5 would be acceptable (without further analysis).

CONCLUSION:

Indications numbers 2 and 3, due to their close proximity to indication number 1, result in the need for further stress analysis to be accepted (whether considered as planar flaws and linked to indication number 1, or considered as surface "aligned linear flaws" and evaluated separately from indication number 1).

Indications numbers 4 and 5 should be acceptable without further analysis.

RECOMMENDATION:

Either, contract with SIA for further evaluation and possible stress analysis (might require future inspection of the indications for next two inspection periods if IWB-3600 stress analysis required) or remove indication number 2 by filing/polishing, thereby permitting indications numbers 3, 4, and 5 to all be considered as acceptable individual "aligned linear flaws" requiring no further disposition. If indication number 2 is removed by filing/polishing, indication 1 would be acceptable to IWB-3500 criteria as a surface planar flaw.

H.B. ROBINSON

SUMMARY OF RECORDED INDICATIONS

1993 - RFO-15

Component Number	Exam Method	Accept As Is	Rework/ Repair	Other RBW 2/2/94	Work Request/Site Memo
CPL-105A-1	MT		✓	IWB-3510-3	92-APTY
CPL-125 1BC	PT		✓		93-AJXJ
CPL-132 13	PT		✓		93-AJMC
CPL-128 6D	PT		✓		93-AJTP
CPL-128 6E	PT		✓		93-AJTP
CPL-109 C	VT		✓		TSE-93-CC
CPL-110 D	VT		✓		TSE-93-CA
CPL-116 E	VT		✓		TSE-93-CZ
CPL-123 BB	VT		✓		TSE-93-CB
CPL-124 I	VT	✓			TSE-93-CM
CPL-124 N	VT	✓			TSE-93-CU
CPL-125 A	VT		✓		TSE-93-CQ
CPL-125 D	VT	✓			TSE-93-EL
CPL-142 A	VT		✓		TSE-93-CW
CPL-143 B	VT		✓		TSE-93-CV
CPL-143 H	VT	✓			TSE-93-ED
CPL-143 HI	VT	✓			TSE-93-EA
CPL-143 L	VT	✓			TSE-93-EB
CPL-143 N	VT		✓		TSE-93-DL EI PT 2/2/94
CPL-213 A	VT		✓		TSE-93-DF
CPL-213 C	VT	✓			TSE-93-CJ
CPL-213 E	VT	✓			TSE-93-CP
CPL-215 D	VT	✓			TSE-93-EK
CPL-215 J	VT	✓			TSE-93-CD
CPL-215 J1	VT	✓			TSE-93-CE
CPL-216 G	VT	✓			TSE-93-EG
CPL-218 A	VT		✓		TSE-93-CH
CPL-218 D	VT		✓		TSE-93-CK
CPL-219 A	VT	✓			TSE-93-CI
CPL-219 C	VT		✓		TSE-93-CL
CPL-219A O	VT	✓			TSE-93-CY
CPL-219A P	VT		✓		TSE-93-CX
CPL-234B B	VT	✓			TSE-93-CN
CPL-245 D	VT		✓		TSE-93-CO
CPL-246 A	VT	✓			TSE-93-EE
CPL-246 G	VT	✓			TSE-93-EN
CPL-247 C	VT		✓		TSE-93-CT
CPL-247 D	VT		✓		TSE-93-CS
CPL-324 A	VT	✓			TSE-93-CF
CPL-324 C	VT	✓			TSE-93-CG
CPL-324B D	VT		✓		TSE-93-EJ
CPL-324D Q	VT	✓			TSE-93-CR
CPL-144 RCP "A" Flywheel	VT	✓		See Attached	N/A

Exam and Evaluation Reviewed	Plant Concurrence
[signature] 2/2/94	Richard B. Weber 2/2/94
ISI Coordinator Date	Plant Designee Date

DATA SHEET NO. 1218-008
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL C/S
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED STEAM GENERATOR B ISO/DWG/SK. # CPL-105A REVISION 0

DATUM POINT REFERENCE ____

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 83L067
Color RED

EQUIPMENT

Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

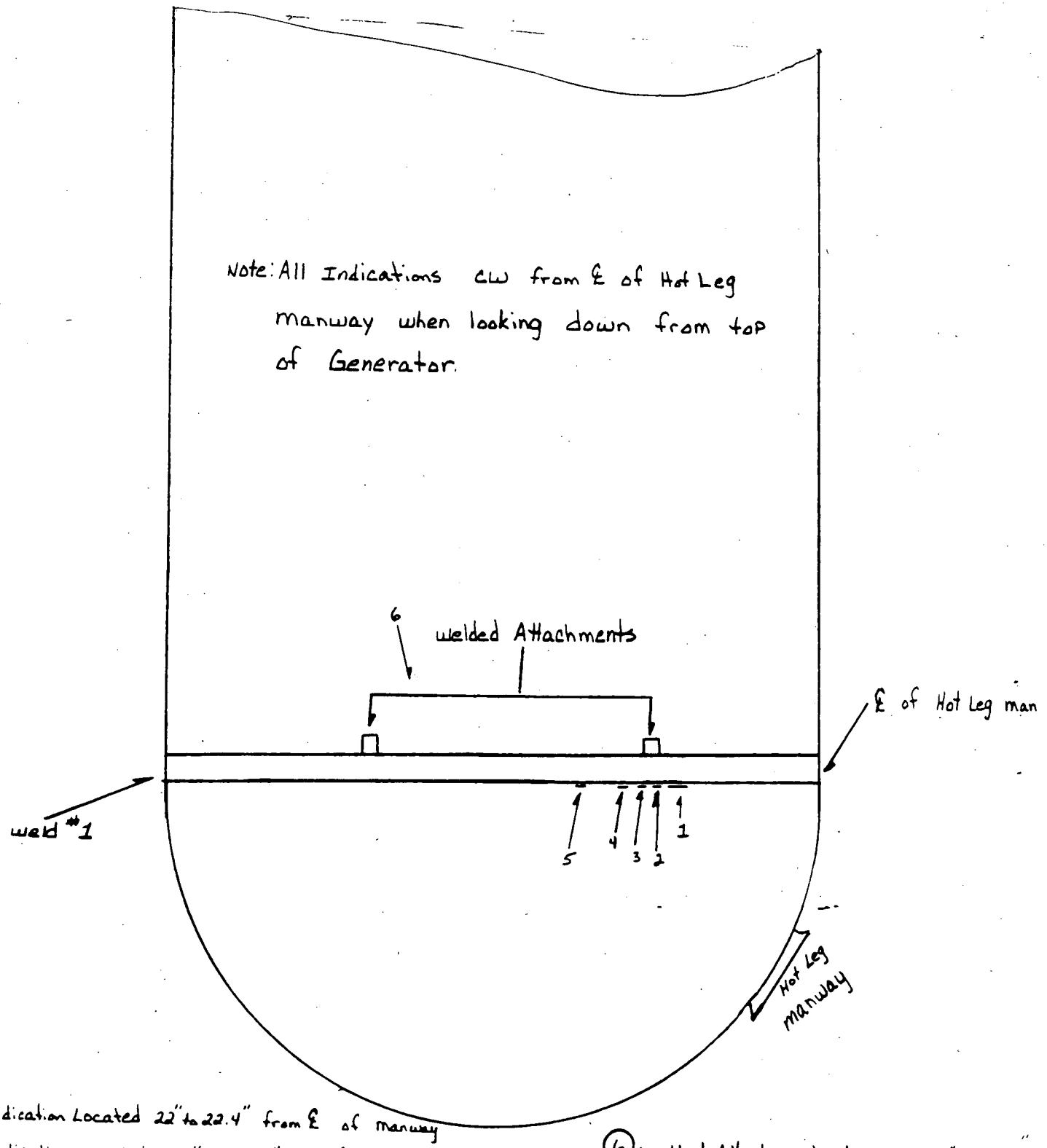
EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 1	5 LINEAR INDICATIONS	N/A	☒
	SEE ATTACHED SKETCH FOR LENGTHS		
	AND LOCATIONS		
	LIMITED EXAM TOTAL OF 5 1/8" DUE TO		
	WELDED ATTACHMENTS.		
	N A		

EXAMINER Tim Oddom LEVEL II DATE 10-2-93
EXAMINER Steve Wollyon LEVEL II DATE 10-2-93
REVIEWER Scott [illegible] LEVEL III DATE 10-4-93
REVIEWER Richard B. Webb DATE 10/5/93
REVIEWER [illegible] DATE 10/5/93

Examiners: Tim Addison LV. II 10-2-93

Steve Wollum LV II 10-2-93

Steam Generator B



(1) Indication Located 22" to 22.4" from ℄ of manway

(2) Indication Located 22.6" to 22.9" from ℄ of manway

(3) Indication Located 23" to 23.25" from ℄ of manway

(4) Indication Located 24.5" to 24.7" from ℄ of manway

(5) Indication Located 26.75" to 26.95" from ℄ of manway

(6) Welded Attachments Located 21" to 23¾" and 122½" to 125⅝" from ℄ of manway

Carolina Power & Light Company
REPAIR WELD DATA REPORT

RWDR Rev. 1 6/4/93

PLANT: RNP	UNIT: 2	CAT: XI-86	DWG: CPL-105A SHT N/A REV 0	WR/PM: 92-APT41

WELD ID: INDICATION 2 REPAIR TYPE: WELD BASE METAL PWHT: Y (N) ISI: (Y) N

BASE METAL SPEC & GRADE SA216/WCC To N/A

SIZE: N/A THICKNESS: 5.25"

WPS/REV : N/A

FILLER METAL-BARE WIRE		COATED OR FLUX CORED ELECTRODE	
CLASS	N/A	CLASS	N/A
SIZE	N/A	SIZE	N/A
HEAT	N/A	HT/LOT	N/A

WELDER(S) SYMBOL N/A

REPAIR INSTRUCTIONS / REMARKS

1) REMOVE INDICATION #2 (SEE PAGE 2) BY FILING/POLISHING/FLAPPER WHEEL
2) PERFORM VISUAL INSPECTION OF REVOVAL AREA
3) PERFORM MT INSPECTION TO VERIFY INDICATION REMOVED
4) PERFORM UT EXAM OF REMOVAL FOR REMAINING WALL THICKNESS
5) MAP REMOVAL AREA LOCATION INCLUDING LENGTH, WIDTH AND DEPTH

1 REVISED to ALLOW THE USE OF A FLAPPER WHEEL FOR INDICATION REMOVAL

QC/ANII HOLD POINTS

ACTIVITY	QC H	QC A	QC R	QC INITIAL/DATE	ANII H	ANII A	ANII R	ANII INITIAL/DATE
2) VT INSP. OF REMOVAL AREA	–	✓		PT 10/7/93				
3) MT INSP.	–	✓		PT 10/7/93				
4) UT THICKNESS INSP	–	✓		PT 10/7/93				
5) REMOVAL MAPPING	–	✓		PT 10/7/93				

RELEASE FOR WELDING

John L Sanders 10/7/93
John L Sanders 10/6/93
WELDING / DATE

RBW 10/6/93 R Wallace 10/6/93
ANII / DATE

RBW 10/7/93

FINAL ACCEPTANCE

10/7/93
INSTALLING DEPT. / DATE

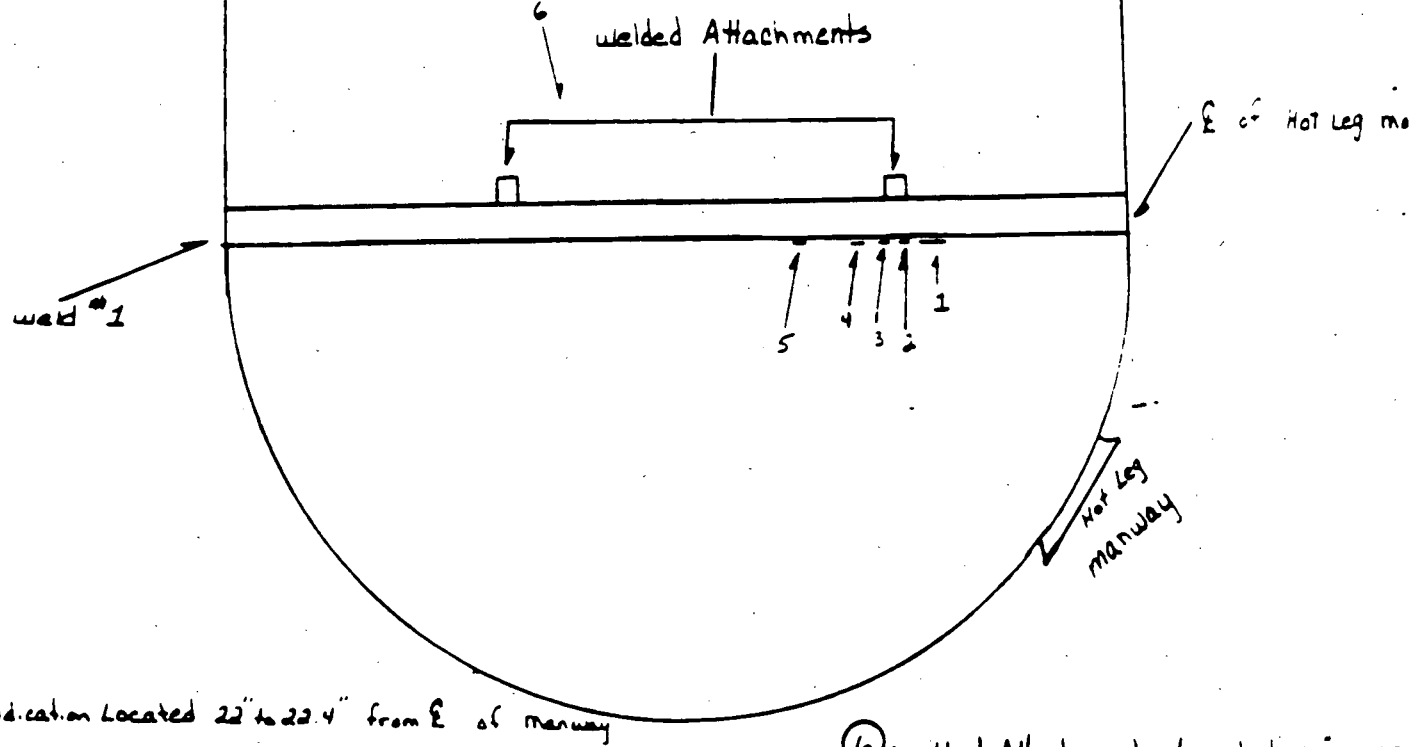
RBW 10/7/93 R Wallace 10/7/93
ANII / DATE

Examiners _____

Steam Generator B _____

IWB-3510-3
105

Note: All Indications CW from ℄ of Hot Leg manway when looking down from top of Generator



(1) Indication Located 22" to 22.4" from ℄ of manway
(2) Indication Located 22.6" to 22.9" from ℄ of manway
(3) Indication Located 23" to 23.25" from ℄ of manway
(4) Indication Located 24.5" to 24.7" from ℄ of manway
(5) Indication Located 26.75" to 26.95" from ℄ of manway

(6) Welded Attachments Located 21" to 23" and 122½" to 125½" from ℄ of manway

DATA SHEET NO. _____
THERMOMETER S/N N/A
TEMPERATURE* N/A ° F
NOMINAL THICKNESS 5.25 INCHES
MATERIAL C/S
CLASS 1

MAGNETIC PARTICLE EXAMINATION

PROCEDURE SP-1218
REVISION 0 F.C. NO. N/A
PAGE 1 OF 2

SYSTEM EXAMINED STEAM GENERATOR B ISO/DWG/SK. # CPL-105A REVISION 0
DATUM POINT REFERENCE SEE ATTACHED SKETCH

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☒ Wet N/A
Make MAGNAFLUX
Type 8A
Batch No. 834067
Color RED

EQUIPMENT

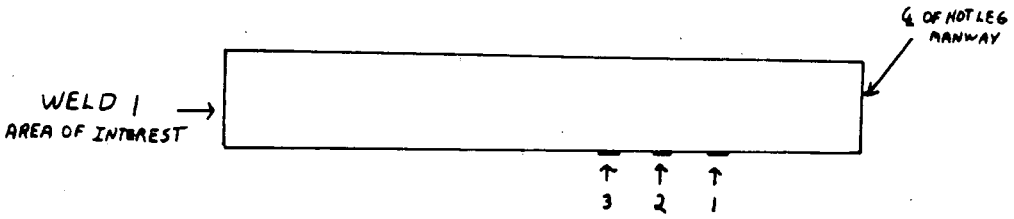
Yoke ☒ Coil N/A Prod N/A
Make PARKER PROBE
Serial No. 423
AC ☒ DC N/A
AMP Turns N/A
AMPS N/A
Pole Spacing 6"
Yoke Lift Test
Yes ☒ No N/A

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD 1	LINEAR INDICATIONS SEE ATTACHED SKETCH	N/A	☒
	N		
	A		

EXAMINER Steve Wollum LEVEL II DATE 10-7-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER Scott Lamp LEVEL III DATE 10-7-93
REVIEWER Richard B. Weber DATE 10/7/93
REVIEWER R Valladares AN II DATE 10/7/93

NES NUCLEAR ENERGY SERVICES, INC.

STEAM GENERATOR "B"



1 INDICATION LOCATED AT 22" to 22.35" FROM ℄ OF MANWAY.
2 INDICATION LOCATED AT 24.5" TO 24.7" FROM ℄ OF MANWAY.
3 INDICATION LOCATED AT 26.75" TO 26.95" FROM ℄ OF MANWAY.

EXAMINER Steve Wollum LEVEL II DATE 10-7-93

ULTRASONIC THICKNESS MEASUREMENT (A-SCAN)

APPENDIX A

THICKNESS CALIBRATION SHEET

PLANT/UNIT: HBR-2 COMPONENT: STEAM GENERATOR "B"

PROCEDURE #: N/A REV. N/A

CALIBRATION BLOCK #1 S/N-6088-83 BLOCK THICKNESS 1"

#2 N/A BLOCK THICKNESS N/A

INSTRUMENT: USL-48

CAL. DUE DATE: 12-3-93

SERIAL NUMBER: 213220-4

SWEEP: 1.78

DELAY: 6.94

RANGE: 2.5"

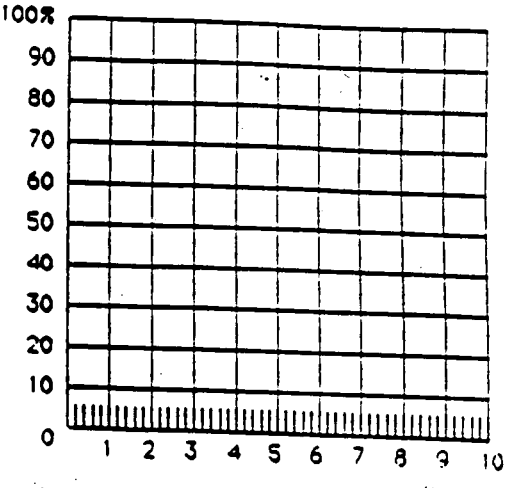
TRANSDUCER FREQUENCY: 2.25 MHZ

TRANSDUCER SERIAL NO.: B02122

TRANSDUCER BRAND: AEROTECH

TRANSDUCER SIZE: .25"

TRANSDUCER ELEMENT: SINGLE OR DUAL



EACH MAJOR SCREEN DIVISION: 1"

CALIBRATION VER. / CHECK	
INITIAL	TIME
SAW	9:30
SAW	11:00
N	
	A

COMMENTS: BEFORE FLAPPING 5.5"
AFTER FLAPPING 5.4"

TOTAL FLAPPING AREA WAS 2"x2"

EXAMINERS 1 Pete Steve Wollum DATE 10-7-93 (10-7-93 CPL LVL I) LEVEL IIL

2 N/A DATE N/A LEVEL N/A

REVIEWERS 1 Richard B Weber DATE 10/7/93

2 RP Balladares AN II DATE 10/7/93

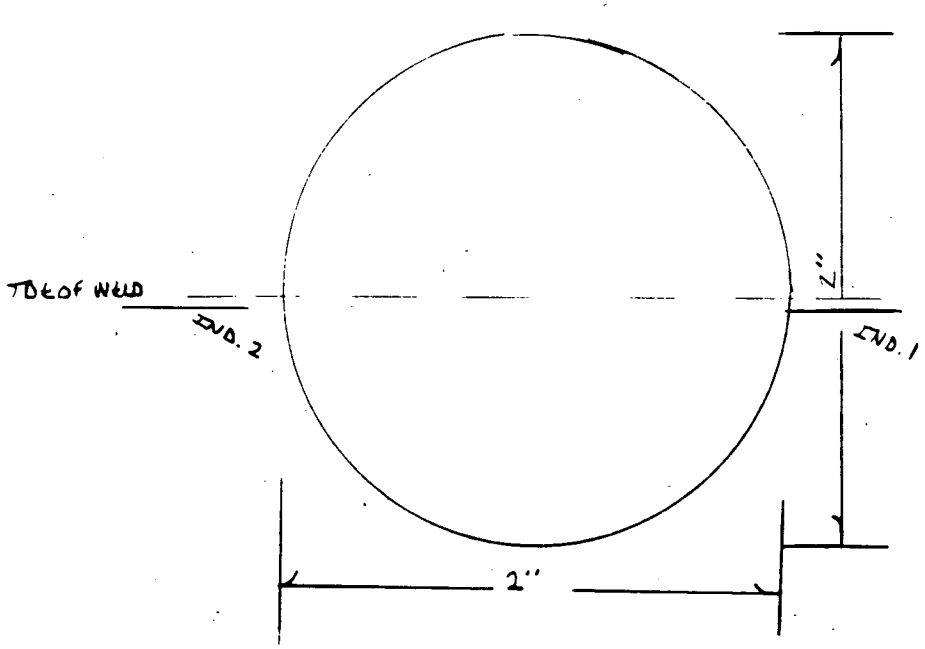
3 _____ DATE _____

ADDITIONAL SHEETS: (YES) NO

CP&L
Carolina Power & Light Company
NDE DRAWING ATTACHMENT

PROJECT HBR JOB NO. N/A UNIT 1☐ 2☒ 3☐ 4☐ DATE 10/7/93

DRAWING	SYSTEM	LINE	WELD/ITEM NUMBER
CPL105A	STEAM GENERATOR "B"	N/A	Weld 1



READING TAKEN in center of the AREA to be FLAPPED 5.5"
READING TAKEN IN CENTER of EXCAVATION After FLAPPING 5.4"

PETE TINGEN CPL UT LVL I 10/7/93

DATA SHEET NO. 1217-026
THERMOMETER S/N MR92-04
TEMPERATURE 86 ° F
NOMINAL THICKNESS .344 INCHES
MATERIAL Stainless Steel
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 1 OF 13
SL 9-29-93

SYSTEM EXAMINED Loop A 2" Letdown Line ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE See Attached Drawing

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	Magnaflux	SKC-NF	92D02P	5 MINUTES
PENETRANT	Magnaflux	SKL-SP	93E01K	15 MINUTES
REMOVER	Magnaflux	SKC-NF	92D02P	5 MINUTES
DEVELOPER	Magnaflux	SKD-NF	92A01P	10 MINUTES

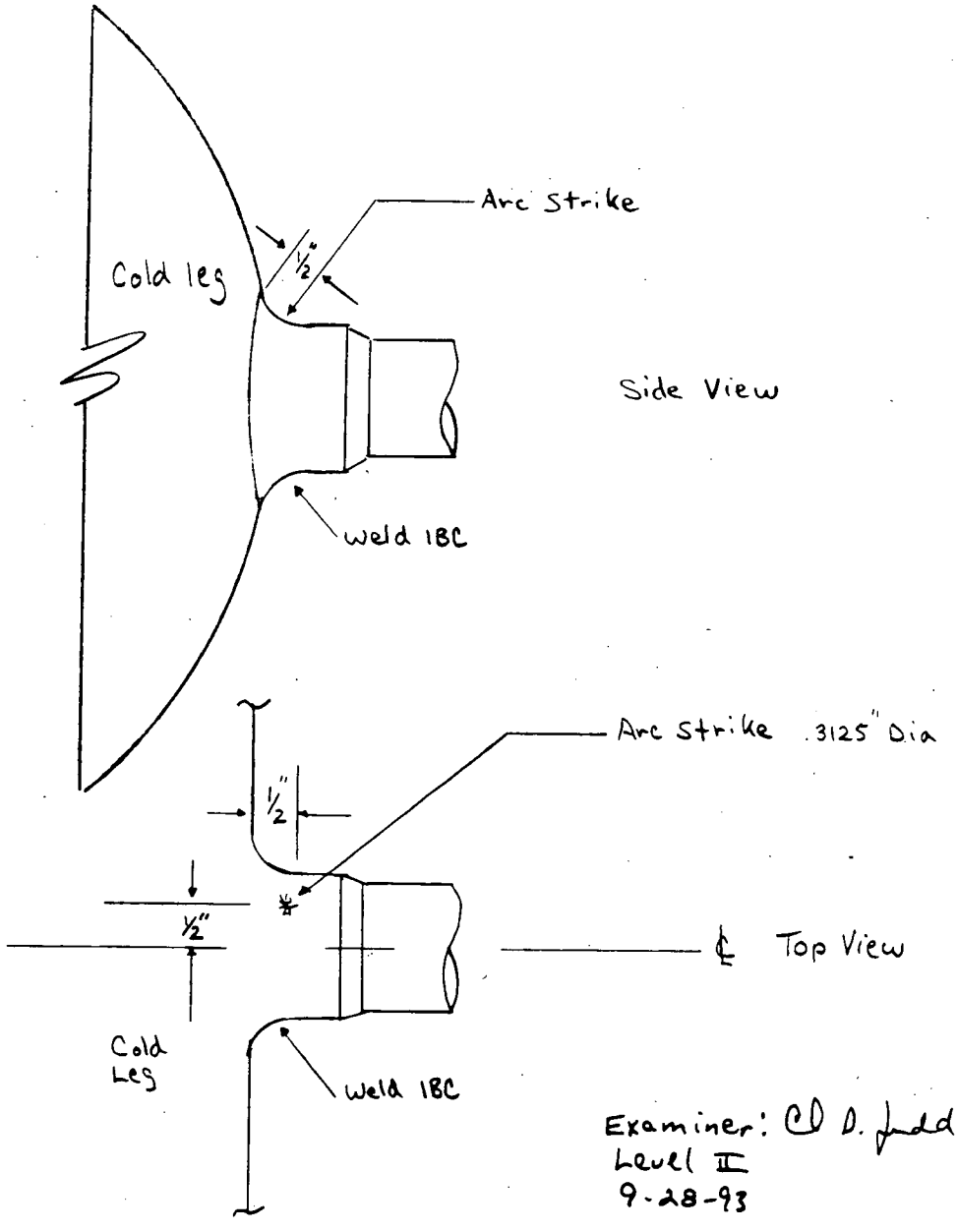
EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
Weld No. 1BC	.3125" Dia Arc Strike, See Attached Drawing	N/A	X

N
A

EXAMINER Chris D. Judd/Cl D. Judd LEVEL II DATE 9-28-93
EXAMINER [signature] LEVEL I DATE 9-28-93
REVIEWER [signature] LEVEL III DATE 9-28-93
REVIEWER [signature] DATE 10/2/93
REVIEWER [signature] AWS DATE 10/2/93

CPL-125 REV. 0

Weld No. IBC



Examiner: CD D. Judd
Level II
9-28-93

DATA SHEET NO. 1217-026
THERMOMETER S/N MR92-03
TEMPERATURE 84 ° F
NOMINAL THICKNESS 2.6" INCHES
MATERIAL 5/S
CLASS I

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 0 F.C. NO. 4824
PAGE 3 OF 3

SYSTEM EXAMINED LOOP A 2" LETDOWN LINE ISO/DWG/SK. # CPL-125 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
PENETRANT	MAGNAFLUX	SKL-SP	93E01K	20 MINUTES
REMOVER	MAGNAFLUX	SKC-NF	92D02P	5 MINUTES
DEVELOPER	MAGNAFLUX	SKD-NF	92A01P	10 MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.
WELD # 1BC	INDICATIONS BELIEVED TO BE FROM INADEQUATE	N/A	N/A
N/A	SURFACE PREPERATION, TO BE REEXAMINED AFTER	N	
	ADDITIONAL SURFACE PREPERATION		A
	N/A		

EXAMINER Chris D. Judd / C D. Judd LEVEL II DATE 9-27-93
EXAMINER Benjamin Sanders LEVEL I DATE 9-27-93
REVIEWER Scott Lamm LEVEL III DATE 9-29-93
REVIEWER Richard A. Weber DATE 10/2/93
REVIEWER ANTI R Pallaghris DATE 10/2/93

Carolina Power & Light Company
REPAIR WELD DATA REPORT

RWDR Rev. 1 5/6/93

PLANT: HBR	UNIT: 2	CAT: B31.1 'BC	DWG: CPL-125	SHT N/A	REV	WR/PM: 93-AJXJ1

WELD ID: 1 BC REPAIR TYPE: WELD (BASE METAL) PWHT: Y N ISI: (Y) N

BASE METAL SPEC & GRADE A182 F316 To N/A

SIZE: 2" THICKNESS: 2" 600# CPL#.

WPS/REV : N/A

FILLER METAL-BARE WIRE		COATED OR FLUX CORED ELECTRODE	
CLASS	N/A	CLASS	N/A
SIZE	HEAT	SIZE	HT/LOT

WELDER(S) SYMBOL

REPAIR INSTRUCTIONS / REMARKS

REMOVE ARC STRIKE BY FILING / GRINDER WHEEL PER INSTRUCTIONS OF WR/J# 93-AJXJ1

*Pre and Post job UT Thickness could not be performed due to component geometry. Only minor filing was performed to remove the indications with no noticable removal areas. no mapping was done PT 10/10/93

QC/ANII HOLD POINTS

ACTIVITY	QC				ANII			
	H	A	R	INITIAL/DATE	H	A	R	INITIAL/DATE
PRE-JOB UT THICKNESS	✓			N/A PT 10/10/93				
PT REMOVAL AREA	✓	✓		PT 10/10/93				
POST-JOB UT THICKNESS/MAP AREA	✓			N/A PT 10/10/93				
PERFORM VISUAL OF REMOVAL AREA	✓	✓		PT 10/10/93				

RELEASE FOR WELDING

FOR TOM HAMILTON 10/10/93
WELDING / DATE

FOR RAY VALLADARES
ANII / DATE

FINAL ACCEPTANCE

10/10/93
INSTALLING DEPT. / DATE

RBW 10/11/93 10/11/93
ANII / DATE

FORM NO. 80369
REV. 9/90

CP&L
Carolina Power & Light Company

LIQUID PENETRANT NDE REPORT

REPORT NUMBER

PT

PAGE 1 OF 1

PROJECT: HBR | JOB NO.: N/A | UNIT: ☐1 ☒2 ☐3 ☐4 | DATE: 10/10/93

DRAWING/ISO	SYSTEM	LINE	WELD/ITEM NUMBER
CPL 125	CH	2-CH-17	1BC

DESIGN CLASS/CATEGORY: 1

ACCEPTANCE STANDARD: ☐ASME III ☐VIII ☐B31.1 ☐AWSD1.1 ☒OTHER AWS D1.1 Sect XI

MTL. TYPE	MTL. THICKNESS	OD/LENGTH	SURFACE FINISH	NDE PROCEDURE
S/S	APPROX 1"	2"	☐AS-WELDED ☒GROUND OTHER	NO. 201 REV. 15

STAGE OF MFG. ☐INFO ☐REPAIR ☐ROOT ☐INTERMEDIATE ☒FINAL

JOINT DESIGN ☐N/A ☐BRN ☐BKS ☐INS ☐OPEN BT ☒SOCKET ☐OTHER

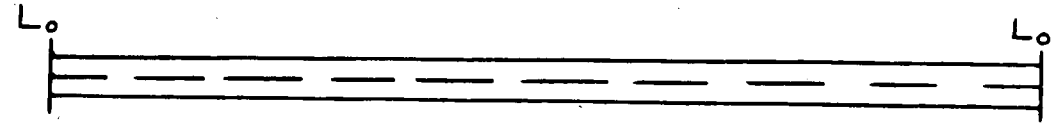
PENETRANT	BATCH NO.	DWELL TIME
SKL-SP	93E01K	15 min
CLEANER: SKC-S	BATCH NO.: 93F03K	
DEVELOPER: SKD-NF	BATCH NO.: 93B04K	DEVELOPMENT TIME: 7

DATA & REMARKS	TEMPERATURE	THERMOMETER NO.	CALIBRATION DUE DATE
N/A	85 °F	NES SN# 962	11/93

L_o LOCATION: N/A | W_o LOCATION: N/A

INDIC. NO.	L	W	UPSTREAM OR DOWN	TYPE INDIC. ROUND/LINEAR	SIZE INDIC. DIAMETER/LENGTH	REMARKS
NONE						

SKETCH



PT'd area of arc strike Removal.
No Indications noted PT 10/10/93

EXAMINATION AREA LIMITATIONS (IF NONE, SO STATE): NONE

EXAMINER	CERTIFICATION LEVEL	DATE
Pete Tingen PETE TINGEN	II	10/10/93
EXAMINER	CERTIFICATION LEVEL	DATE

(TO BE COMPLETED AS INDICATED)

IF APPLICABLE CONTRACTOR REVIEWER	TITLE
REVIEW DATE	COMMENTS

IF APPLICABLE CP&L QA REVIEW	DATE	IF APPLICABLE ANI/AI R.B. Williams	DATE 10/11/93

QA PT-2, Rev. 1, 9/16/87

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project HBR
Job No. 93-AKWS1
PSI☐ ISI☒

System: RHR	Component Name: Support	Component ID: 109 C
Drawing/Location: CPL 109 Rev 0 / Containment 1st level in "B" Bay		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/26/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Valladares 10-28-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-002
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Reactor Coolant	Component Name: Support/Hanger	Component ID: 109C
Drawing/Location: CPL-109 & R/O 9-24-93	Reactor Bldg. 240'-Elev. Above Stairs Between B S/G and B RCP	
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

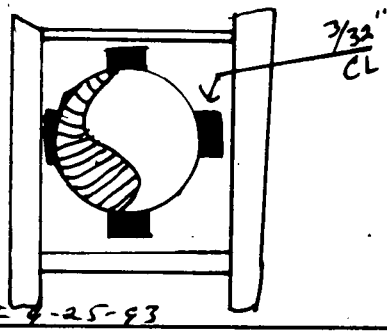
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		See Attached Sheet (page 2 of 2)
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		See Attached Sheet (page 2 of 2)
Abnormal wear			
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		Clearance Required is 1/16" See Sketch Below
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☑ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-24-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Identification not marked on component

Reviewed: [signature] 9-25-93

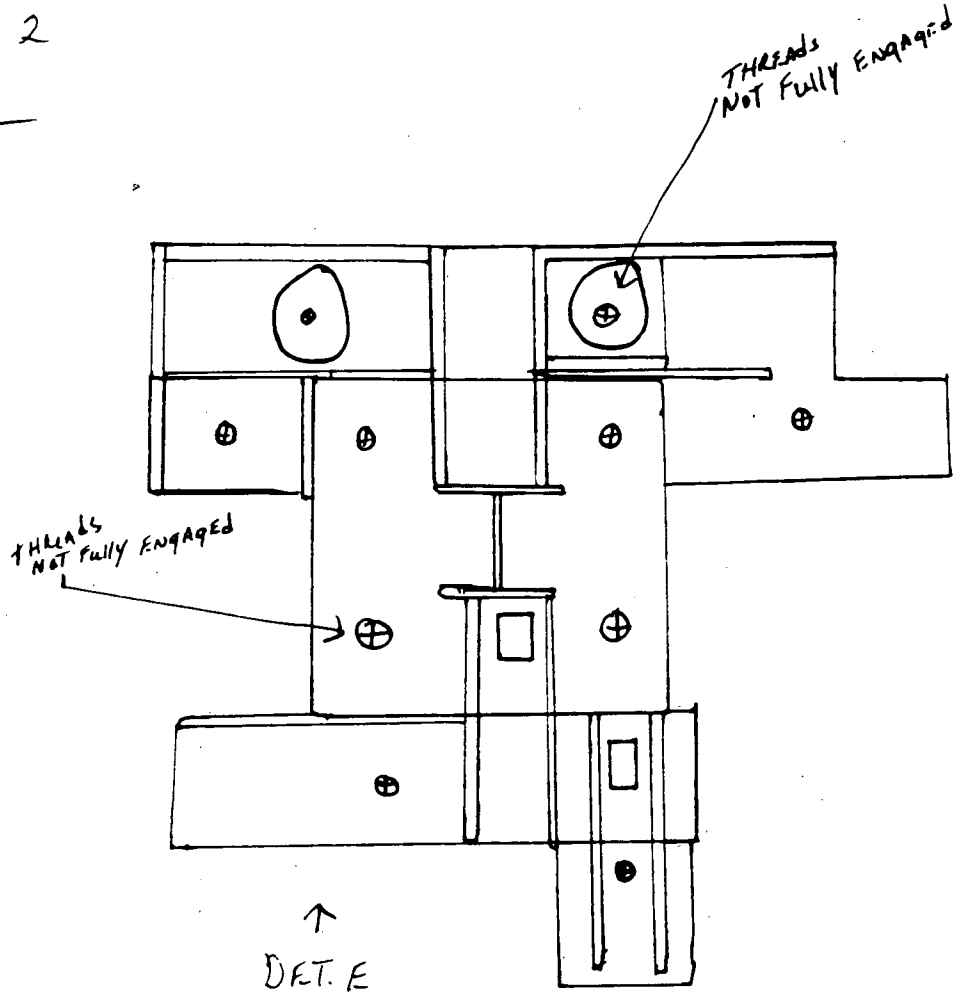
(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

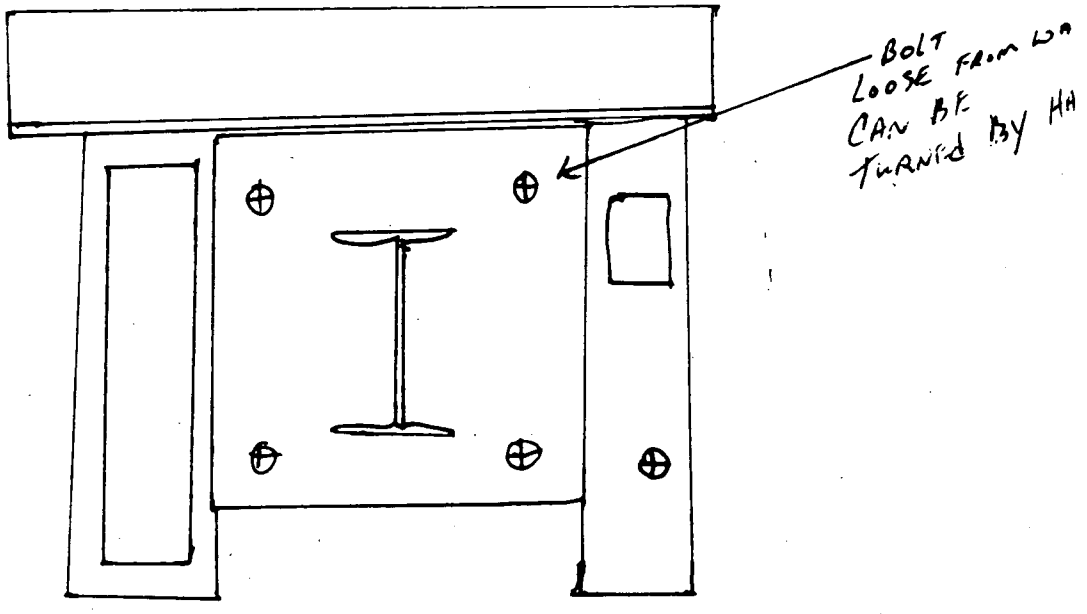
CPL-1C9 R/C 1230-002

PAGE 2 OF 2

Eugene Singer
9-24-93



DET. E



DET. C
(RIGHT BASE A)

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-109 - C as documented on attached VT-3 inspection report.
SI-3/3135

SITE MEMO # TSE-93 - CC
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lam 9/25-93
RESPOND BY: 10/2/93

*RELEASING AUTHORITY: Van. Nap DATE: 25 SEP 93

RESPONSE:
Support CPL-109-C (SI-3-3/35) as additional Recommended Corrective actions are described on attached SCAFEDS

DISTRIBUTION
Dick Weber

SIGNED: L. A. Jones 10/19/93

*RELEASING AUTHORITY: K. D. Dyksterhouse DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-109-C Visual Exam Report No. 1230-002

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
The 1"WAB shown on lower left of base plate in Detail E of SI-3-3135 sh 5 should have full thread engagement restored by removing the extra washers as required and retorquing the nut to 250-260 Ft. lbs. QC should verify correct torque used. Contact NED CIVIL if there are insufficient threads on the bolt to achieve full thread engagement after removing washers. The number of washers remaining after full thread engagement is achieved should be noted on WR closeout. A copy of this closed out WR should be routed to NED CIVIL for use in updating the drawing. Removal of the extra washers does not constitute a design change but it may impact the as-built drawings.

Basis:
There were four indications noted on the VT-3 inspection report. None of the indications render the support dysfunctional Each is acceptable as follows:

1) ELEV A. denotes 1/16" clearance on right hand side of pipe. VT-3 inspector measured 3/32" using 6" scale. The 1/32" difference is insignificant when reading with a scale. When checked by NED or readings are typically ±1/32" unless a feeler gauge is used to positively measure true gap. No further evaluation is required

2) DETAIL C - The loose anchor bolt noted by VT-3 inspector was evaluated by Bpasco during 79-14 walkdowns and analysis as ineffective and was documented as-such on the As-Built dwg for SI-3-3135 No further evaluation or corrective action is required.

Harvey Ferris 10/20/93

T.A. Jones 10/19/93

NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-109-C Visual Exam Report No. 1230-002

3) DETAL E - The upper right hand WAB was noted by VT-3 inspector as lacking full thread engagement. NED field check found that the nut only lacked about 2/3 of one thread from full engagement. This is an insignificant deviation particularly when compared to the very small tension load on the anchor bolt and nut. According to App. D sheet 77 of calc S1-3-3135 this bolt is element 973 in the Base Plate Computer analysis. According to sh 85 the tensile load on #173 is .1843 K which is only a small fraction of the anchor capacity of 3.854 K. Full thread engagement is not critical and for this anchor not practical due to stiffeners around the bolt and spacer installed between plate, washer and single washer under the nut. No further evaluation or corrective action is needed.

4) DETAIL E. The next to bottom WAB on the left hand side of the base plate lacks 2-3 threads of full engagement. This bolt is identified as element node 1686 in the Base plate analysis and according to sh 85 of the calc the tension load is only .2852 K which is only 7.4% of the allowable for 1" WAB as according to DG II. Without further analysis it is obvious that even with 2-3 threads not engaged (30%) the loads are so small that it is not a significant issue requiring corrective action. The required integrity is more than adequate as is. Since there are Five washers under the nut it would be prudent to remove them as needed to achieve the full design intent. The dwg can be updated to reflect the As-Built. The number of washers under the nut is irrelevant to the design or calculation. If there is not sufficient threading on the bolt with a couple of washers removed the washers can be restored as needed to torque against.

None of these indications require short term operability or functional status of support.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2
Job No. 93-AJXM-1

SL 10-20-93
Report No. ~~93~~ 1230.006 A
Page 1 of 1
PSI☐ ISI☒

Project

System: ST	Component Name: Variable Support	Component ID: 110-D
Drawing/Location: CPL-110		
☒ VT-3 Procedure: SP-1230 Rev.	☐ VT-4 Procedure:	Rev.
Direct ☒ Remote ☐	Video Recording No.: N/A	☐ N/A

Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 3000 lbs		
Snubber	Actual: NA	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Scott Lowe Level: III Date: 10-20-93

Examiner: Level: Date:

Comments: Reexamined after repair.
WR 93-AJXM1

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-006A
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SAFETY INJECTION	Component Name: VARIABLE SUPPORT	Component ID: 110-D-10
Drawing/Location: CPL-110 R/O / RX. BLDG. - FLOOR EL. 228' AGAINST CRANE WALL		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Eugene Sing Level: II Date: 10-13-93

Examiner: N/A Level: N/A Date: N/A

Comments: No Indications Noted (Support was Re-Inspected After Repair)

(ISI Use Only)
☒ Pass
☐ Fail

ISI Reviewer: Richard A. Weber 10/14/93

ANII A. Balladares 10-14-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-006
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: ~~SI~~ SAFETY INJECTION TO RCS	Component Name: VARIABLE SUPPORT	Component ID: 110-D
Drawing/Location: CPL-11C R/C		
☒ VT-3 Procedure: SP-1230 Rev. C	☒ VT-4 Procedure: N/A	Rev. N/A
Direct ☑ Remote ☐	Video Recording No.: N/A	☐ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

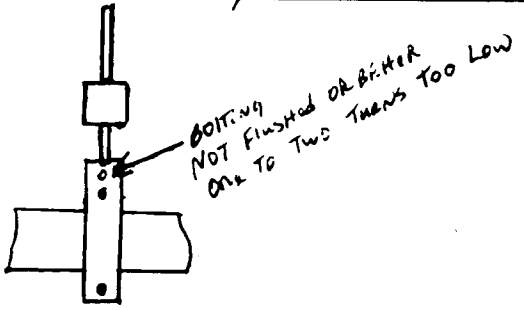
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		LACK OF FULL THREAD ENGAGEMENT
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 3000 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-21-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: [signature] Date: 9/23/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-110-D as documented on attached VT-3 inspection report.

SITE MEMO #: RSE-93-
SHEET OF
MOD #:
PCN:
RET: R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: [signature] x1880

RESPOND BY: 9/30/93

*RELEASING AUTHORITY: David B. Weber DATE: 9/23/93

RESPONSE:

Support is functional. Recommended corrective action is described on attached Support Corrective Action / Evaluation Documentation Sheet.

DISTRIBUTION
Dick Weber

SIGNED: L. A. Jones

*RELEASING AUTHORITY: K. D. Dyksterhouse DATE: 9/30/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-110-D Visual Exam Report No. NA

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

Tighten bolt and nut until end of threads are one to two threads beyond nut. As a minimum flush is acceptable but extra threads beyond flush w/ nut is acceptable. The existing bolt is long enough to achieve full thread engagement. This is WR item to restore full design configuration

Basis:

The existing condition is only one full thread short of being flush with nut. The nut is not under direct load since its function is to prevent the load bolt (which is in shear) from slipping out of plane in the pipe clamp during course of operating and heat up/ cooldown cycles. The lack of only one to two threads being engaged is insignificant but bolt and nut should be tightened to achieve design configuration in full. Access scaffolding is in place to enable WR to be worked. Note: Lock nuts are not require per vendor drawings.

L. A. Jones 9/29/93

NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project HBR
Job No. 93-AKWX1
PSI ☐ ISI ☒

System: RC	Component Name: Support	Component ID: 116 E
Drawing/Location: CPL 116 / Containment "C" Bay		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/27/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Balladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-084
Page 1 of 1

Project HBR2 Job No. PSI☐ ISI☒

System: RC	Component Name: SUPPORT	Component ID: E
Drawing/Location: CPL-116		
☒ VT-3 Procedure: SP-1230 Rev. 0	~~☒~~ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ~~☒~~ N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: ~~☒~~ Hydraulic Snubber ~~☒~~ Mechanical Snubber ☒ Support/Hanger ~~☒~~ Constant Support ~~☒~~ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference	N/A	X	" " "
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	SHIM MISSING
Loose/missing parts	X	N/A	" "
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion	N/A	X	" " "
Abnormal gouges	N/A	X	" " "
Arc Strikes on sliding support	N/A	X	" " "
Misalignment of the support	X	N/A	CLEARANCE GAP 3/16"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

~~☒~~ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: [signature] Date: 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dykesterhouse UNIT:
ATTN: Avery Jones
SUBJECT: SI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-176 as documented on attached VT-3 inspection report.

SITE MEMO: TSE-93-
SHEET OF
MOD #:
PCN
RET-RG93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: [signature] 10-20-93

*RELEASING AUTHORITY: Richard D. Weber DATE: 10/11/93

RESPONSE:
Support is functional short-term. Required corrective action is described on SCAQ93

DISTRIBUTION
Dick Weber

SIGNED: [signature] 10/20/93

*RELEASING AUTHORITY: [signature] DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-116-E Visual Exam Report No. 1230-084

[ ] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[✓] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

INSTALL SHIMS UNDER LINE TO OBTAIN 0" CLEARANCE AS SPECIFIED ON DRAWING SK-A-RC-3-180. INSTALL SHIMS PER ~~EPC-HAB2-004~~ WJ 10/24/93 AND CORPORATE WELDING MANUAL. SHIMS ARE CONSIDERED NON-Q. 455 436 MATERIAL OR EQUAL.

Basis:

BASED ON A REVIEW OF THE PIPING & HANGER BY NED CIVIL & STRESS THE HANGER WILL CONTINUE TO SERVE ITS FUNCTION IN THE LATERAL & AXIAL DIRECTIONS. THE VERTICAL LOAD (DEADWEIGHT) IS IN THE UPWARD DIRECTION FOR THE NORMAL CONDITION. ONCE THE PIPE IS BROUGHT UP TO TEMPERATURE, THE PIPING ON THE SOUTH SIDE OF THE SUPPORT MOVES DOWNWARD WHILE THE PIPING ON THE NORTH SIDE MOVES UPWARD. DURING ACCIDENT CONDITIONS THE HANGER WOULD HAVE CONTINUED TO SUPPORT THE PIPE VERTICALLY, BUT THE GAP UNDER THE PIPE WOULD HAVE LED TO INCREASED PIPE STRESSES. THE INCREASED STRESSES WOULD NOT HAVE LED TO A PIPE FAILURE. THEREFORE, THE SUPPORT IS CONSIDERED FUNCTIONAL BUT CORRECTIVE ACTIONS ARE REQUIRED BEFORE RETURN TO SERVICE.

Wayne Scott 10/24/93
NED Engineer Date

C. A. Jones 10/20/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project NBR Job No. 93-AJXK1 PSI☐ ISI☒

System: Charging	Component Name: Support	Component ID: 123 BB
Drawing/Location: CPL123 Rev 0 / Containment 1st level		
☒ VT-3 Procedure: 614 Rev. 1		☐ VT-4 Procedure: N/A Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Peter Level: II Date: 10/27/93

Examiner: Level: Date:

Comments: Support documented in Report # 1230-007 as 123 EE is incorrect. After a walkdown with NED Eng. it was determined to be 123 BB. WR 93AJXK1 corrected the discrepancies in accordance with site memo TSE 93-CB

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-007
Page 1 of 2

Project HBR Job No.

PSI ☐ ISI ☒

System: CHGING	Component Name: HANGER	Component ID: EE
Drawing/Location: CPL-123		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev.
Direct ☒ Remote N/A	Video Recording No.:	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror N/A Other	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION NOTED
Mechanical interference	N/A	X	" " "
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	MISSING NUT SEE DWG
Loose/missing parts	X	N/A	" " " "
Abnormal wear	N/A	X	NO INDICATION NOTED
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

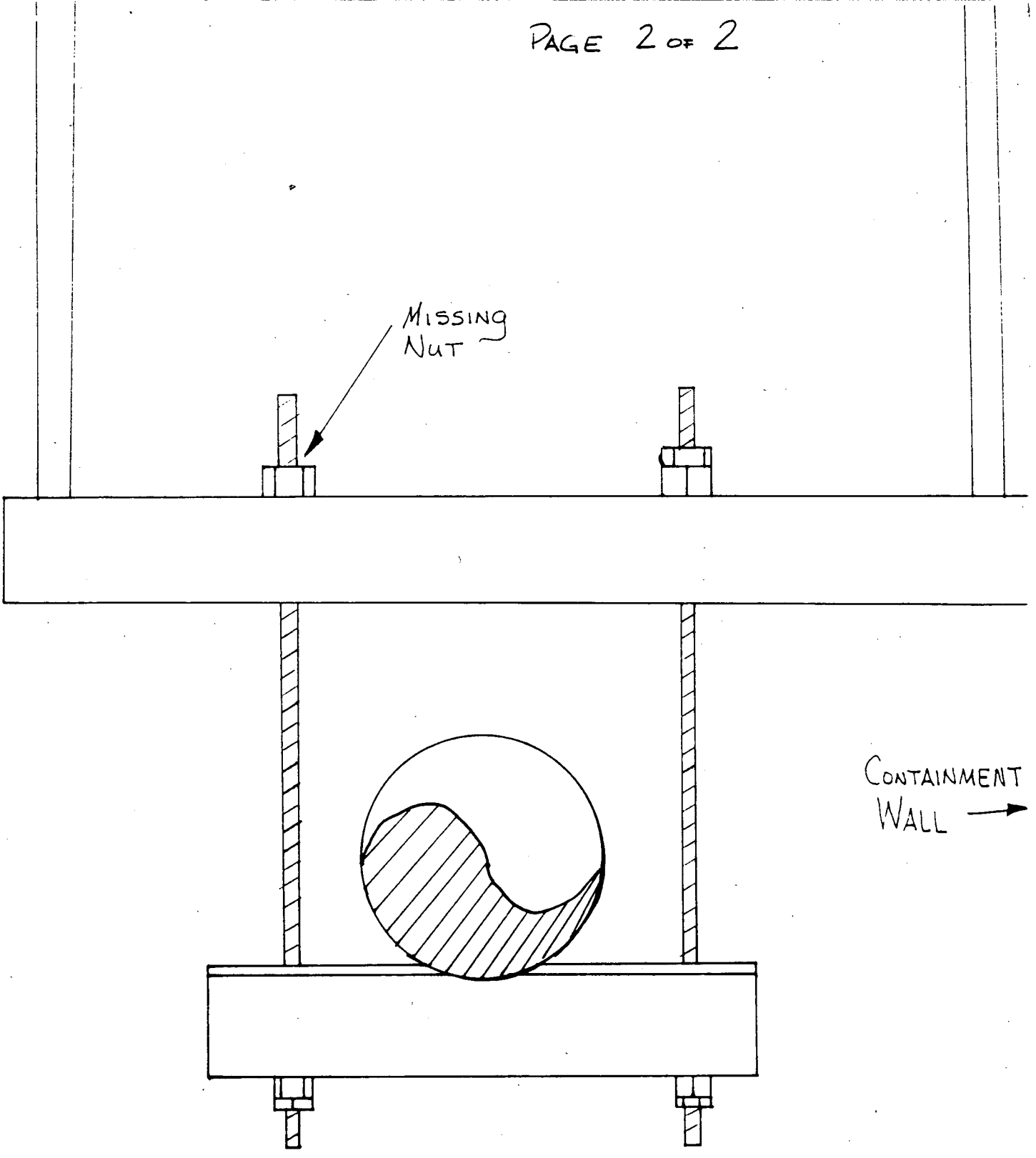
Examiner: Kenneth L. Lance Level: II Date: 9/22/93

~~Reviewer~~ Examiner: Scott Larson Level: III Date: 9-23-93

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 9/23/93



HBR2 DRAWING CPL-123

VIEW UPSTREAM

HANGER "EE"

9/22/93

KENNETH R NANCE

NED Guideline Number A-45
Use of NED Site Memos

ATTACHMENT
PAGE OF

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Brevard Jon Wilterhouse DATE:

ATTN:

SUBJECT:

Referenced from the conversation between the NRC and CPL

CPL has submitted additional information regarding the

Response

SIGNED:

*RELEASING

DATE

RESPONSE:

Supervisor

Corrective

Sheet. "As

as CPL-12

actually CPL

at inspection

SIGNED:

*RELEASING

*PLEASE PRINT NAME OVER SIGNATURES IF THEY ARE

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPA-123-BB Visual Exam Report No. NA

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

Replace missing jamb or lock nut. The replacement nut shall be ASTM A-563 GR A (R or Non-R) or equal. Acceptable substitutes are A-194 GR 7 or 2H. Size will match threaded rod in field. Diameter is estimated as 5/8" & but could not be direct measured in field at time of field examination due to lack of ladders available. Nut shall be installed snug tight. Rod threads will probably require some cleaning prior to installing nuts. Nut may be hex nut, hex, or heavy hex. Reconciliation is a WR item.

Basis:

Support is Non-Safety Related Dead weight (Impact Hanger w/ Rods) Primary nut is intact therefore, carrying capability is unaffected. Nut shall be replaced to restore support to full design configuration. Lock nuts are snug tight per CPL-HBR2-C-211; lock nuts do not need torque.

[redacted]

[redacted] Engineer 9/29/94 Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-044
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CHEM. & VOL. CONTROL	Component Name: SUPPORT/HANGER	Component ID: 124-I
Drawing/Location: CPL-124 R/O / RX. BLDG. 228' ELEV.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

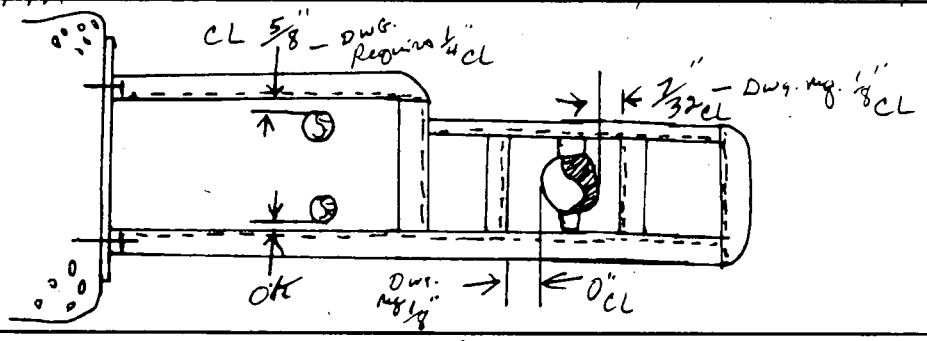
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CM

ISI Reviewer: Richard B Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANN Wilkerson 10/28/93

ATTACHMENT 1
PAGE 1 OF 2

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-724 - I as documented on attached VT-3 inspection report.

SITE MEMO #
TSE-93 - CM
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Larsen 10-6-93

*RELEASING AUTHORITY: Richard D. Weber DATE: 10/6/93

RESPONSE:
Support is acceptable as-is

DISTRIBUTION
Dick Weber

SIGNED: L A Jones 10/9/93

*RELEASING AUTHORITY: Al Fuller DATE: 10/10/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-124-I Visual Exam Report No. 1230-049

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None

Basis:
CPL-124-I is support CH-4-42. It is a 2 way restraint as indicated on stress iso CH-4 node 1092. The cumulative gap on the lateral direction per design dwg was 1/8" + 1/8" = 1/4" > 7/32" measured by VT-3. While current design standards limit limit lateral clearances on a 2 way to 1/16" each side or 1/8" cumulative the support is within the original criteria. The cumulative gap is within the acceptable range and may have been set at 1/8 / 1/8" to allow for thermal growth or movement in pipe. It should be further noted that readings to 1/32" with scale are not as accurate as with design gages. NED field check indicated less than 3/16" cumulative clearance. These clearances are not rejection standards per IWF 3400. The other two pipes shown on CH-4-42 are not supported or restrained by this restraint. The VT-3 measured clearances are insignificant and irrelevant to the hanger. The dwg reflects a minimum as-built clearance which assures the two pipes do not bind on the support and contribute unanalyzed loads to the support.

L. A. Jones 10/9/97
NED Engineer Date

BTL

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-057
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Chem. & Volume Control	Component Name: Support/Hanger	Component ID: 124-N
Drawing/Location: CPL - "R" 124 R/O		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

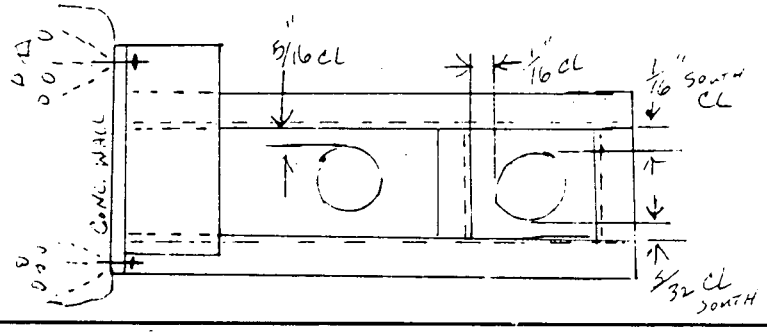
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Eugene Finn Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CU

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AWH APWalbadares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-124-N as documented on attached VT-3 inspection report.

SITE MEMO # ISE-93-120
SHEET 1 OF 1
MOD M-
PCN
RET-R G93-60

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lamm 10-7-93

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/7/93

RESPONSE:
Support is acceptable as is.

DISTRIBUTION
Dick Weber

SIGNED: [illegible] 10/9/93

*RELEASING AUTHORITY: [illegible] DATE: 10/10/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-124-N Visual Exam Report No. 1230-057

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None

Basis:
CPL-124-N is a two-way seismic support for 3-CH-15A according to stress Iso CH-4 where it is identified as node 1038. According to the Rev 1 design drawing CH-4-38 the top and bottom clearances vary from the north face of the support to the south face due to a slight vertical skew as the pipe passes through the support. While the 1984 As-Built denoted a cumulative clearance of 5/16" on the north face the south face is detailed with only 1/16" cumulative clearance. The VT-3 inspection recorded different clearances. The readings were made with a scale rather than the more accurate method of feeler gages. The VT-3 readings on the south face were 1/16" + 3/32" for a cumulative total of 5/32". NED field checked the clearances and found that all cumulative clearances in each direction for 3-CH-15A were 1/8" or less. This acceptable and consistent with the criteria of HBRR-CO11. The support will function as 2 way for the time as intended

L.A. Jones 10/9/93
NED Engineer Date
BTL

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-124-N Visual Exam Report No. 1230-057

as is. It should be further noted that clearances are not an accept/reject criteria for determining whether support is acceptable to remain in service as is. Only when the clearances are indicative of degradation of the structural integrity or ability of the support to function as intended are clearances a critical characteristic.

The 5/16" clearance to the other pipe shown on CH-4-38 is insignificant. The dwg denoted 3/16" clearance. Support CH-4-38 is a lateral & vertical seismic for 3-CH-15A only. The clearance to the other pipe is more of an as-built minimum that assures the other line does not bind against the CH-4-38 support and add load to the support. Aft 3/16" (min) or the 5/16" measured the other line will not add design loading to the support. If the other pipe was intended to be restrained by CH-4-38 the clearances on the other 3 sides would also be closer (1/8" total or less). No further evaluation is required

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230.046A
Page 1 of 1
PSI☐ ISI☒

Project HBR Job No. 93-AKNP1

System: Letdown	Component Name: Support	Component ID: 125A
Drawing/Location: CPL 125 Rev 0 / Containment, "A" Bay @ RCP		
☒ VT-3 Procedure: NDEP 6.16 Rev. 1		☐ VT-4 Procedure: N/A Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☒ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual:	Stroke:	S/N

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Pete J Level: II Date: 10/18/93

Examiner: Level: Date:

Comments: Reinspection after Rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

AN11 [illegible] 10-28-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1234-046
Page 1 of 1

Project HBR2 Job No.

PSI☐ ISI☒

System: LETDOWN LINE	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-125		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Constant Support N/A Mechanical Snubber N/A Variable Support	☒ Support/Hanger

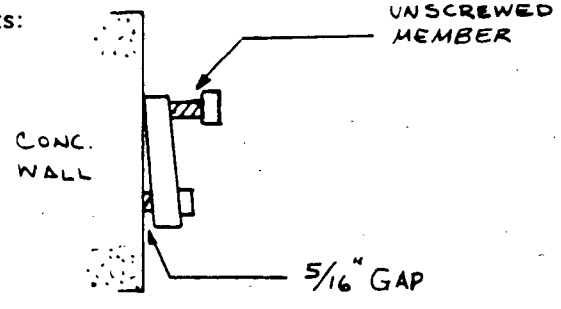
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support	X	N/A	SEE DRAWING BELOW
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") X Reject (When any answer above is "yes")

Examiner: Kenneth R. Hance Level: II Date: 10-5-93

Examiner: N A Level: N A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber 10/27/93

NDE ISI 11, Rev. [illegible]

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-125 - A as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 - CQ
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION:
Dick Weber

SIGNED: Scott Larson 10-5-93

RESPOND BY:

***RELEASING AUTHORITY:** Richard K Weber **DATE:** 10 6 93

RESPONSE:
Support is instituted short term as the Corrective Actions required are described on attached SCAIEDS

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/4/93

***RELEASING AUTHORITY:** L D Dyksterhouse **DATE:** 10/4/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID 12L-3C-H Visual Exam Report No. 1230-046

[ ] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[✓] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

RE-TIGHTEN ANCHOR BOLTS TO TIGHT SNUG CONDITION. IF BOLTS CANNOT BE TIGHTENED BY USING NORMAL FORCE, REMOVE BOLT AND CLEAN DEBRIS USING ANCHOR BOLT SLEEVE THREADS AND 1) REINSTALL EXISTING BOLT UTILIZING FLAT WASHERS AS REQ'D TO MAKE UP GAP, OR 2) INSTALL NEW BOLT (A307GRB) WHICH IS SHORT ENOUGH TO MAKE-UP GAP & STILL MAINTAIN MINIMUM THREAD ENGAGEMENT OF 1/2". NOTE NEW BOLT SHOULD HAVE 2 FLAT WASHERS AS MIN.

Basis:

THE NORMAL FUNCTION OF THE SUPPORT IS TO SERVE AS A VERTICAL/LATERAL RESTRAINT. AN ANALYSIS WAS PERFORMED TO DETERMINE THE AMOUNT OF TIME A LOOSE ANCHOR BOLT COULD REMAIN WITHIN THE SUPPORT WHICH WOULD BE ACCEPTABLE. BASED ON THE ANALYSIS DOCUMENTED IN ELR-1113-C6.0, THE SUPPORT WAS DEEMED FUNCTIONAL FOR THAT TIME PERIOD. THE TIME ELAPSED SINCE THE LAST TIME THE SUPPORT WAS FUNCTIONAL. THE BOLTS HAVE BEEN TRANSMITTED TO THE VENDOR FOR ANCHOR BOLTS. EVEN WITH THE ANCHOR BOLTS BACKED OUT THERE IS SUFFICIENT EVIDENCE TO CALCULATE THAT THE MINIMUM THREAD ENGAGEMENT OF 1/2" IS PRESENT, AND THE ANCHOR BOLTS ARE ACCEPTABLE.

Kevin Wolf 1/14/93
NED Engineer Date

L.A. Cyrus 1/14/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Variable Supports	Component ID: 125 D
Drawing/Location: CPL-125 R/O / Rx. Bldg. - 228'-Elev Rep "A" BAY		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

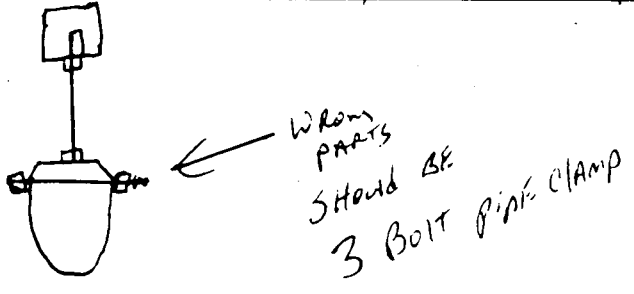
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 7/8		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: II/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-EL

ISI Reviewer: Richard B. Weber 10/28/93

ANII A. Valladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-125-D as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-E
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lowe 10-11-93

RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/11/93

RESPONSE:
The support is acceptable as is. The drawing is in error and will be revised by NED.

DISTRIBUTION
Dick Weber

SIGNED: L.A. Jones 10/16/93

*RELEASING AUTHORITY: M.A. Cook DATE: 10/16/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-125-D Visual Exam Report No. -

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None by Plant Maintenance or Tech Support. The drawing is in-correct and will be revised by NED to reflect the correct As-Built configuration

Basis:
CPL-125-D is an Non-Safety Related deadwt. The rod and clevis found in the field are in good, serviceable conditions and are providing their intended function as deadwt supports. The drawings are in error, due to incorrect field notes prepared when several supports were walked down at one CV entry. The dwg error does not in any way impact in service conditions. No further evaluation is required

[signature] 10/16/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI☐ ISI☒

Project HBR Job No. 93-AKWW1

System: High Head Inj.	Component Name: Support	Component ID: 142 A
Drawing/Location: CPC 142 Rev 0 / Containment 1st Level "C" Bay		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/26/93

Examiner: Level: Date:

Comments: Inspection after Rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-107
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 142-A
Drawing/Location: CPL-142R/0 / Ex. Bldg. 5/6 & Cubs. -28' Elev.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

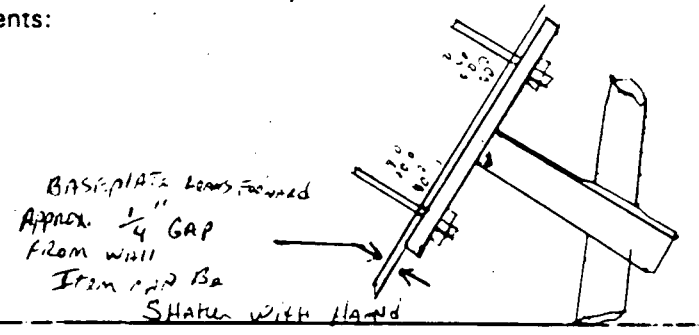
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Eugene Sing Level: II Date: 10-11-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B. Weber 10/27/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: CISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-1142-1A as documented on attached VT-3 inspection report.

SITE MEMO #: TSE-93-[illegible]-CW
SHEET OF
MOD #:
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lam 10-11-93
RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/12/93

RESPONSE:
Support is functional. Recommended corrective actions are described on attached SCAIEDS

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/19/93

*RELEASING AUTHORITY: D/Dyksterhouse DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-142-A Visual Exam Report No. 1230-107

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
Clean at any debris that may be between base plate and concrete surface. Both anchor bolts should have the nuts tighted to snug up the base plate to the concrete. Torque the nuts and anchors to 40-45 Ft.LBS.

Basis:
CPL-142-A is a Non Safety Related deadweight support. The anchors and nuts are intact and providing the deadweight function as required. The tightening and torquing to close up the gap will restore the original design but will not adversely cold spring the pipe since the pipe bears on an angle ~~sup~~ suspended by rods. As the base plate moves laterally to close the gaps the pipe is not restrained laterally. No further evaluation is required

L. A. Jones 10/19/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI ☐ ISI ☒

Project HBR
Job No. 93-AKWP1

System: CVCS	Component Name: Hyd. Snubber	Component ID: 143 B
Drawing/Location: CPL143 Rev 1 / Containment 1st Level		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☒ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: 4 9/32	Stroke: N/A	S/N 25

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: PTA Level: II Date: 10/27/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-008
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CHEM. & Volume Cont.	Component Name: HYDRAULIC SNUBBER	Component ID: 143B
Drawing/Location: CPL-143B, Rev. 9-25-92 / CPL 143R/1 / RX. Bldg. 228'E/W. ABOVE SUMP.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☒ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☐ Variable Support

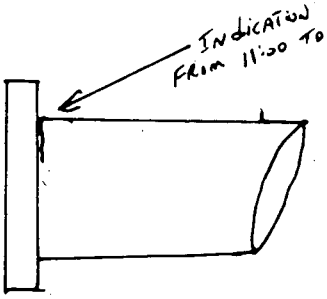
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges	✓		1½" x ⅛" x 1/10" CUT IN WELD (SEE SKETCH BELOW)
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: 4 9/32"	Stroke: N/A	S/N 25

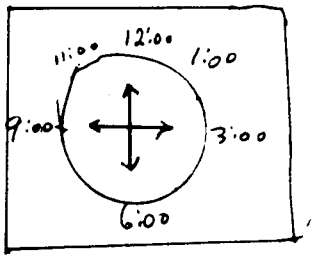
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-25-93

Examiner: N/A Level: N/A Date: N/A

Comments:





Reviewed: Scott Lane 9-27-93

View Looking SOUTHWEST

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-143-B as documented on attached VT-3 inspection report.
CH-4-SN25

SITE MEMO # TSE-93 -CV
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lam 9-27-93

*RELEASING AUTHORITY: Richard O. Weber DATE: 10/12/93

RESPONSE:
Support is functional. Recommended corrective action is described on attached SCA/EDR

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/20/93

*RELEASING AUTHORITY: K.M. Dyksterhouse DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

DATA SHEET NO. 1217-059
THERMOMETER S/N MR-92-04
TEMPERATURE 72 °F
NOMINAL THICKNESS N/A INCHES
MATERIAL SS
CLASS 1

LIQUID PENETRANT EXAMINATION

PROCEDURE SP-1217
REVISION 1 F.C. NO N/A
PAGE 1 OF 1

SYSTEM EXAMINED CHEMICAL & VOLUME CONTROL ISO/DWG/SK. # CPL-143 REVISION 0
DATUM POINT REFERENCE N/A

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER	MAGNAFLUX	SKC-S	93F03K	5 MINUTI
PENETRANT	"	SKL-SP	93E01K	15 MINUT
REMOVER	"	SKC-S	93F03K	5 MINUT
DEVELOPER	"	SKD-NF	93B04K	7 MINUT

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	RE.
B	PT EXAM OF REJECTABLE VT EXAM. NO INDICATIONS NOTED.	X	N/
N/A	N/A	N/A	

EXAMINER [signature] LEVEL II DATE 10-11-93
EXAMINER N/A LEVEL N/A DATE N/A
REVIEWER [signature] LEVEL III DATE 10-11-93
REVIEWER Richard B. Weber DATE 10/28/93
REVIEWER _____ DATE _____

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-143-B Visual Exam Report No. 1230-008

[ ] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
The weld should be repaired in accordance with the Caporate Welding Manual. The min weld per AISC is 1/8" fillet. The plate is 304 SS. The pipe trunnion is either 304 or 316 SS.

Basis:
The existing weld with the notch cut is structurally adequate for full DBE load as is but should be restored to full design condition.
According to calc CH-A-SN-25 the snubber load is only 670#. The minimum required weld is only .042" when using normal allowables with DBE load. See attached calculation sheet, when emergency allowables are used with the DBE loads the margin of integrity is even greater.

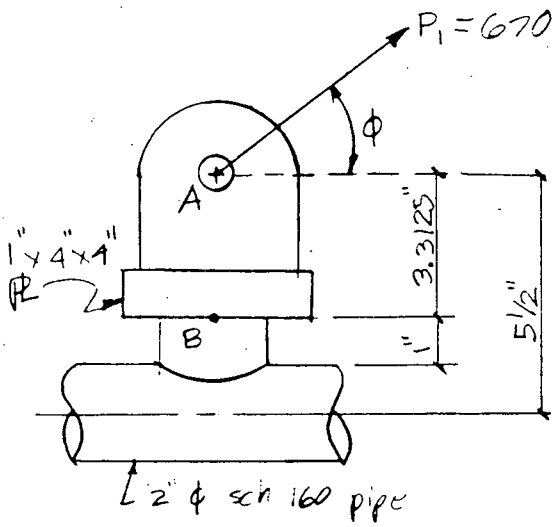
L.A. Jones 10/20/93
NED Engineer Date
BTL

FORM NO. 78055 REV. 10/85

Computed by: Date:	CAROLINA POWER & LIGHT COMPANY	Calculation ID: CH-4-SN25	
Checked by: Date:	CALCULATION SHEET	Pg. of	Rev.
Tar / PID No.:		File:	
Project Title:			
Calculation Title:			
Status: Prelim. ☐ Final ☐ Void ☐			

CH-4-SN25

$F_2 = 670\#$ $\phi = 29.26°$ (pg 6 of CH-4-SN25 calc



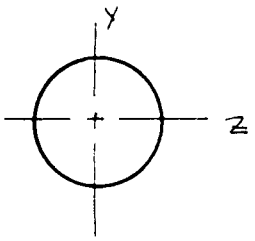
snubber axis is parallel to global Z

Forces @ A

F_z (parallel to pipe) $= 670 \cos 29.26° = 585\#$

F_x ($\perp$ to pipe) $= 670 \sin 29.26° = 328\#$

Point B is @ centroid of weld between 1"x4"x4" plate and pipe junction



$F_z = 585\#$ $M_z = 0$

$F_x = 328\#$ $M_x = 0$

$F_y = 0$ $M_y = 585\#(3.3125") = 1938"\#$

$A_w = 2.375\pi_2 = 7.46"$

$S_w = \frac{\pi 2.375^2}{4} = 4.43$

$f_r = \left[\left(\frac{328}{7.46} + \frac{1938}{4.43}\right)^2 + \left(\frac{585}{7.46}\right)^2\right]^{1/2} = 488\#/in$

Min. weld required $w_f = \frac{317}{.707\,(15,800)} = 0.044 < .125$ min per AISC

min required is only 35% of min fillet per AISC using DBE load and normal allowables. Length of notch in weld is approximately 1½" of the 7½" length of weld or 20% considered less than fully effective due to notch. This weld is compared to capacity of weld

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-063
Page 1 of 1

Project HBR2 Job No. PSI ☐ ISI ☒

System: Aux. Spray Line	Component Name: Support	Component ID: H
Drawing/Location: CPL-143		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other Neutral Gray Card	Type of Component Support: N/A Hydraulic Snubber N/A Constant Support N/A Mechanical Snubber N/A Variable Support ☒ Support/Hanger	

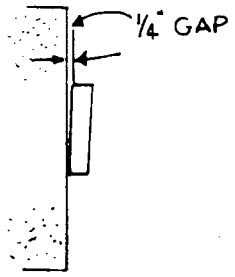
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support	X	N/A	1/4" GAP
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth A. Hance Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass Acceptable per Site Memo TSE-93-ED-
☐ Fail

ISI Reviewer: Richard O. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Valladares 10/28/93

ATTACHMENT 1
PAGE 1 OF 2

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:

ATTN: Avery Jones

SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-143 -27 as documented on attached VT-3 inspection report.

SITE MEMO #
TSE-93 - 80
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott [signature] 10-11-93

RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/11/93

RESPONSE:
Support is acceptable as is

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/16/93

*RELEASING AUTHORITY: [signature] DATE: 10/16/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-143-H Visual Exam Report No. 1230-063

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

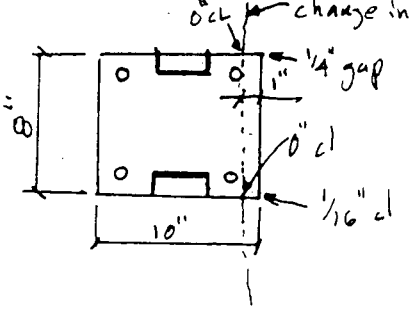
[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

The gap noted on the VT-3 is only under the right hand edge of the baseplate and does not constitute a degradation CPL-143-H is vertical seismic restraint CH-4-96.1 was field checked by NED. The gap occurs at an irregularity in the concrete surface caused by a slippage in the forms when the concrete was cast during original plant construction. The base plate has full bearing contact with the wall from top to bottom and for 9" of the 10" width of the base plate. The gap is at the left perimeter only outside the bolt lines. This is insignificant on a four bolt base plate, particularly when a support such as this one is a vertical seismic only. According to Stress calc 4544 the net forces are always a positive Y. All four bolts are good and snug with no gaps under the heads or in the bearing areas of the Bolts behind the base plates. No further evaluation is required



C. A. Jones 10/15/93
NED Engineer Date

Harvey Ferris 10/16/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-083
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Chemical & Vol. Control	Component Name: Support / Hanger	Component ID: 143-H1
Drawing/Location: CPL-143 R/1 / RX. Bldg. - Floor Elev. 228' outside crane wall		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ N/A Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

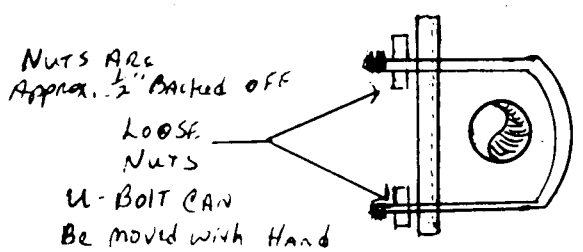
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		U-Bolt very Loose, see Sketch Below
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-8-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-EA

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AWH A Walladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-143-H, as documented on attached VT-3 inspection report.

SITE MEMO# TSE-93-[illegible]
SHEET 1 OF 1
MOD M-
PCN
RET-R G93=GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lem 10-4-93

RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/11/93

RESPONSE:
Support is acceptable as is. M-1104 additions on the multi-gang hanger resolved the indication

DISTRIBUTION
Dick Weber

SIGNED: L.A. Jones 10/6/93

*RELEASING AUTHORITY: K.D. Dyksterhouse DATE: 10/18/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-143-H1 Visual Exam Report No. 1230-083

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None;

Basis:
CPL-143-H1 is not modelled on the Safety Related ISO CH-4 sh 3. With loose U-bolt it still provides dead wt support with the nuts in place. When the support was field checked the U-bolt had been snugged up and lock nuts added therefore, no further action is required. In its current configuration CPL-143-H1 will provide seismic support but is not relied upon in the current seismic analysis for safety related service. CPL-143-H1 is only one of many pipes supports on the same multi-sang hanger that was inspected under M-1104. Probably the nuts were tightened in response to Mod activities or VT-3. No further evaluation is needed.

Harvey Ferris 10/16/93

L.A. Jones 10/16/93

NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project HBR Job No. 93-AKWQ1 PSI☐ ISI☒

System: CH	Component Name: Support	Component ID: 143 L
Drawing/Location: CPL 143 Rev 1 / Containment "B" Bay @ Stairs		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		missing nut on U Bolt
Loose/missing parts	✓		U Bolt loose
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/27/93

Examiner: Level: Date:

Comments: Per site memo TSE 93-EB the disposition of these indications was to remove uBolt if accessible or leave in place if inaccessible or high radiation level. This uBolt is inaccessible to be removed due to HVAC duct work in the way and the Pressurizer Surge line overhead. Per the disposition this hanger is now acceptable.
PT 10/27/93

(ISI Use Only)
☑ Pass
☐ Fail

Acceptable per site memo TSE-93-EB

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: CH	Component Name: Support/Hanger	Component ID: 143-L
Drawing/Location: CPL-143 R/1 / Rx. Bldg 228' Near Steps in "C" Door 5/6		
☑ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☑ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☑ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

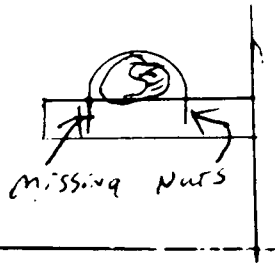
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-20-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☑ [illegible]

ISI Reviewer: Richard B. Weber 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-743-1 as documented on attached VT-3 inspection report.

SITE MEMO: TSE-93-FB
SHEET OF
MOD NO:
PCN
RET-R G93-G0

DISTRIBUTION
Dick Weber

SIGNED: Scott Kam 10-11-93
RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/11/93

RESPONSE:
Support is functional. Recommended corrective action is described on attached SCA/EDs.

DISTRIBUTION
Dick Weber

SIGNED: L.A. Jones 10/19/93

*RELEASING AUTHORITY: A.M. Dykstra Loves DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-143-L Visual Exam Report No. —

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

Remove the U-Bolt. The U-Bolt may remain in place without nuts if access and dose rates are significant barriers to removal. Notify NED of completed action by copy of closed WR or site memo if U bolt is left in place. As-Built drawing to be updated by NED accordingly.

Basis:

According to Stress calc 271 and Isp RC-3 sh 3 this support is a Non-Safety Related deadweight support. The guide provides the deadweight support. The U-bolt is not required for the deadweight function of the support. Leaving in place without nuts will not adversely affect the deadweight function. Adding nuts would create a seismic restraint in an uncanalyzed configuration. The support is functional with or without the U-Bolt, no nuts. The insulation serves to hold the U-bolt in place and prevent its coming loose so as to become hazard.

L.A. Jones 10/19/93

NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project NBR Job No. 93-AKNQ1 PSI☐ ISI☒

System: CH	Component Name: Support	Component ID: 143 N
Drawing/Location: CPL 143 Rev 0 / Containment 1st level B Bay		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date:

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

AN II [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-062
Page 1 of 1

Project HBR 2 Job No. PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: N
Drawing/Location: CPL-143		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

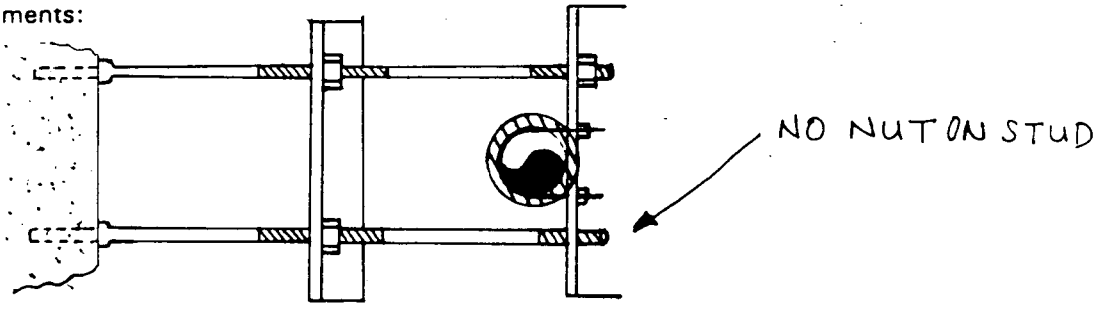
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATION NOTED
Mechanical interference	N/A	X	" " "
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	MISSING NUT
Loose/missing parts	X	N/A	" "
Abnormal wear	N/A	X	NO INDICATION NOTED
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth L. Hance Level: II Date: 10-7-93

Examiner: Level: Date:

Comments:



(ISI Use Only)
— Pass
✓ Fail

ISI Reviewer: Richard B. Weber 10/27/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-143-N as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-
SHEET OF
MOD #
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Jones 10-11-93

RESPOND BY:

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/11/93

RESPONSE:
Support is functional short term, the required corrective actions are described on attached SCAIEDS

DISTRIBUTION
Dick Weber

SIGNED: L.A. Jones 10/14/93

***RELEASING AUTHORITY:** K.R. Dykstra Lowe **DATE:** 10/14/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-143-N Visual Exam Report No. 1230-062

[ ] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[X] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
Replace the missing Flat Washer (Non-Q) and 5/8" Hex nut (Non-Q). The nut should be ASTM A-563 GR B or better or equal. Flat washers may be MFG. Standard. Nut should be tightened at least 1/2 turn after washer w/ nut contact the support angle and is snug-tight. The threads on both rods should be staked on the ends to prevent future loosening and loss of load nuts.

Basis:
The support is a Non-Safety Related deadwt in between two seismic/deadwt Safety Related supports on 2-CH15B which is on Stress Iso RC-3 sh 3. According to Stress calc #271 this deadwt is supported for only 40# of deadwt. while the 117 node carries 82# and 121 node carries 48#. With the load nut missing from one of the rods on the impeze the 40# deadwt is transmitted to the remaining 5/8" rod which is anchored in the concrete above by 5/8" SAB which according to NED design guide DG II.I has an allowable tension load of 3402 with a 5:1 F.S. In that as designed each rod would have seen 20# each shifting the whole 40# to a rod with pullout capacity of 3402 would be insignificant since T = 40# is only 1% of allowable Ta. The rod itself has a tensile area of .226 in^2 with F_u = 36 ksi on A-36 steel. F_{ta} = .33 F_u = 11,880 psi so Ta = .226 in^2 x 11,880 psi = 2685 #. The load on one rod due to 2CH15B # 40# is only 1.5%

E.A. Jones 10/14/93
NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-143-N Visual Exam Report No. 1230-062

of the rod which is insignificant. The applied deadwt is not and has not been sufficient to deflect the support angle at the end where the load nut is missing. The rod without load nut protrudes through the support angle with adequate threads beyond to attach the missing nut. The support is supporting the required dead load as is but needs to be restored to the design condition. The deadwt without the load nut on one rod is relatively small and has not been sufficient to bend the rod or deflect the support angle due to the cantilevered end on the angle with the load nut with the other end not supported by lead nut

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-021A
Page 1 of 1
PSI☐ ISI☒

Project Job No.

System: Main Steam	Component Name: Variable Support	Component ID: 213 A
Drawing/Location: CPL-213		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other ____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☑ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 2 3/4" from top edge of window (Mid Range)		
Snubber N/A	Actual:	Stroke:	S/N

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: III Date: 10-21-93

Examiner: N/A Level: N/A Date: N/A

Comments: Reexamined area of ~~repair~~ repair SL 10-21-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weller Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10.28.93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-071
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: MAIN STEAM	Component Name: VARIABLE SUPPORT	Component ID: 213A
Drawing/Location: CPL-213 R/C / Rx Bldg. 275' Elev. Below Grating (next Main Steam pipe)		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

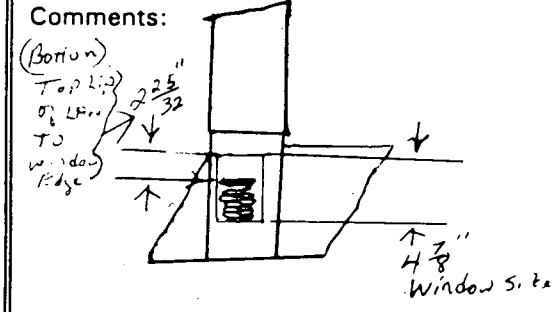
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: $2\frac{25}{32}$" From Edge of Window (See Sketch)		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

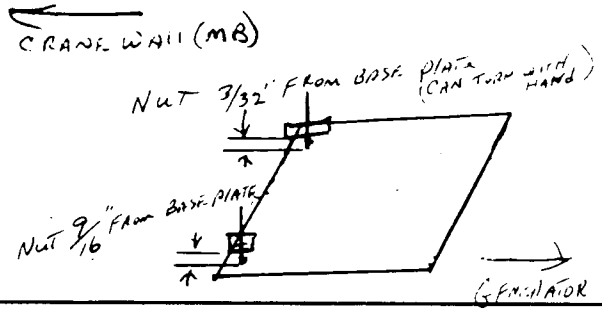
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:





(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**

ATTN: Avery Jones

SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-213 - A as documented on attached VT-3 inspection report.

SITE MEMO #	TSE-93 - DF
SHEET	**OF**
MOD M-	
PCN	
RET-R	G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott [signature] 10-11-93

***RELEASING AUTHORITY:** Richard B. [signature] **DATE:** 10/11/93

RESPONSE:
Support is functional as is. Corrective actions are described on attached SCA/EDS

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/14/93

***RELEASING AUTHORITY:** James R Paul **DATE:** 10/15/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-213-A Visual Exam Report No. 1230-071

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
The loose 3/4" nuts should be tightened to a "snug tight" condition. At least 1 flat washer (Non-Q) should be under each nut. Washers should be added where missing. Additional washers may be added to fill gap under nuts provided full thread engagement is maintained.

Basis:
CPL-213-A is a variable deadwt Non-Safety Related support for 26-MS-2. The bolts should have snug nuts & the bolts should have insignificant loads since the direction of force on a spring can support is supposed to downward only. Any forces on the bolts should be some shear and tension from friction between the bearing plates of the pipe stanchion and the spring can that may occur if pipe moves horizontally (laterally or axially).

The lack of legibility on the spring can label does not render the can dysfunctional. Typically when spring cans are specified the load settings are usually in the midrange of the size and type specified. The can for CPL-213-A has the load indicator bar well within the midrange of the window of travel on the can. The spring and load have plenty of travel room to adjust to the hot and cold loads as intended. No further evaluation is required

C.A. Jones 10/14/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-025
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: MS	Component Name: VARIABLE Support	Component ID: 213C
Drawing/Location: CPL-213 R/O / RX. Bldg. 251'-8" Elev. NEXT TO Elevator		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

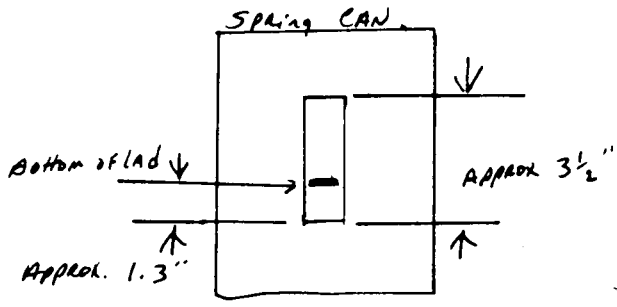
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks			
Missing attachment/hardware	✓		
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments:



NO GAUGE MARKER ON CAN

Reviewed: [signature] LIII 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

Acceptable as is per Site Memo TSE-93-CJ

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project NB2 Job No. PSI☐ ISI☒

System: MS	Component Name: Variable Support	Component ID: 213 C
Drawing/Location: CPL 213 Rev 0 / Containment 2nd level		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		N/A	
Mechanical interference		N/A	
Cracks		✓	
Missing attachment/hardware		N/A	
Loose/missing parts		N/A	
Abnormal wear		N/A	
Abnormal corrosion		N/A	
Abnormal gouges		N/A	
Arc Strikes on sliding support		N/A	
Misalignment of the support		N/A	
Variable/Constant Support	Actual:		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/28/93

Examiner: Level: Date:

Comments: This inspection documents that there was no cracks on the structural members of the hanger. Report # 1230-025 does not have the block marked or N/A'd. Other attributes are the same as the original report PT 10/28/93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

SITE MEMO # TSE-93-12J
SHEET OF
MOD M-
PCN
RET-R G93-GQ

Please provide resolution for the discrepancies on CPL-213-C as documented on attached VT-3 inspection report.

DISTRIBUTION
Dick Weber

SIGNED: Scott [illegible] 10-4-93

RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/4/93

RESPONSE:
Accept as is

DISTRIBUTION
Dick Weber

SIGNED: [illegible]

*RELEASING AUTHORITY: K S Dyksterhouse DATE: 10/22/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID (ISI) CPL-213-C Visual Exam Report No. 1230-025

[✓] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

NONE

Basis:

BY REVIEW OF STRESS ANALYSIS PROBLEM NO 1003, IT HAS BEEN DETERMINED THAT THE THERMAL MVMT = +.158". BY INSPECTION OF THE ISI REPORT IT HAS BEEN DETERMINED THAT THERE IS ADEQUATE TRAVEL AVAILABLE TO ACCOMODATE THE CALCULATED THERMAL MVMT. SUPPORT IS A NON-SAFETY RELATED, DEAD-WT SPT.

NED Engineer 10/21/93 Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: MAIN STEAM	Component Name: Support / Hanger	Component ID: 213E
Drawing/Location: CPL-213 R/0 / RX. BLDG. - FLOOR Elev. 251'-8"		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

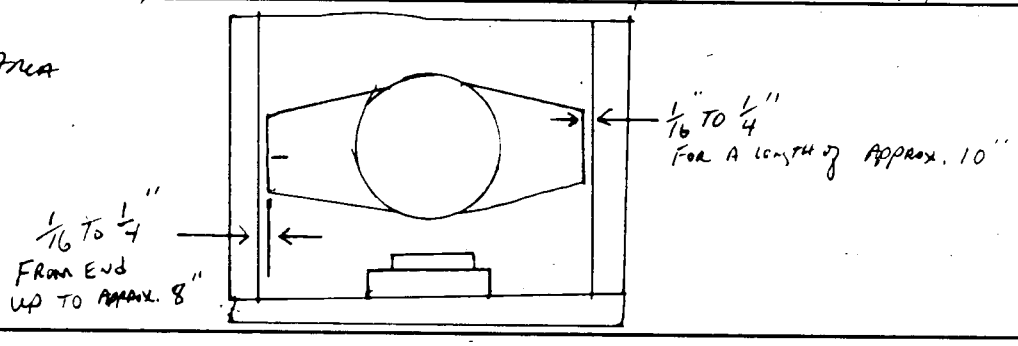
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:
Rust on Area



(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CP

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Valledares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-2/3-E as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-CP
SHEET OF
MOD #
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: [signature] 10-6-93
RESPOND BY:

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/6/93

RESPONSE:
Support is acceptable as-is. No corrective actions required.

DISTRIBUTION
Dick Weber

SIGNED: [signature] 10/7/93 [signature] 10/11/93

***RELEASING AUTHORITY:** [signature] **DATE:** 10/11/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-213-E Visual Exam Report No. _____

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None

Basis:
Support MS-1B/1003 is a lateral only restraint on 26-MS-2 according to Iso MS-1B. While the drawing specified 1/16" clearance between the lateral pipe gussets and the support vertical members the VT-3 measurement was variable from 1/16" up to 1/4" from the top down on the west side and 1/16" up to 1/4" from the bottom to the top on the east. The cumulative clearance at the top of the gusset is up to 3/16" and up to 3/16" at bottom. This is acceptable from two different perspectives

1) The Main steam line has a max operating temperature of 510 degree. The clearances were measured with the line at cold shutdown when the ambient air and line temperature was, 80° ± 10° F. When the line is in service the thermal expansion of the line and the lateral gussets will more than offset the extra

10/11/93

L. L. Jones 10/7/93
NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-213-E Visual Exam Report No. _____

1/16" clearance measured with the line cold. The thermal expansion is calculated as follows:

$$\ell_t = \Delta t \times (\ell_p + \ell_{lateral}) (\alpha_t)$$

$$= (510-80)\ (26.00" + 10.5")\ (6 \times 10^{-6}) = .0935" > 1/16"$$

The thermal growth of .0935" offsets the extra 1/16" measured cold but is less than the .125 cumulative specified so adequate clearance is maintained to avoid axial binding of the pipe. The variably clearance is evidently of a result of some axial rotation in pipe which would produce very slight cocking of lateral gussets as they related to the support.

2) The "1/16" on either side measured is within HBR2-C-011 tolerances. The lack of 1/16" for the 4.11 height of the gusset would not have a significant or adverse impact on the functional ability of the support to restrain lateral movement in seismic or thermal induced movement.

No further evaluation is required. Support is acceptable.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-060
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: FEEDWATER	Component Name: VARIABLE Support	Component ID: 215-D
Drawing/Location: CPL-215 R/O / Rx. Blg. 251'-8" Floor Elev.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		SEE Comment
Variable/Constant Support	Actual: 2250# (Near Missile Barrier) And 2025# (Near Rx Secondary Wall)		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: Hot load Requires - 2700# And Cold Load Requires 2250# in Accordance With Drawing

(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-EK

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-213-D as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 - EK
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lam 10-11-93

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/11/93

RESPONSE:
The support is acceptable as is. The drawing is in error and will be raised by NED.

DISTRIBUTION
Dick Weber

SIGNED: C. A. Jones 10/16/93

*RELEASING AUTHORITY: M. A. Boyd DATE: 10/16/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-215-D Visual Exam Report No. 1230-060

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None by Plant Maintenance or Tech Support. The drawing is in error and will be revised by NED.

Basis:
CPL-215-D is Non-Safety related variable deadwt support w/ spring cans. The CL settings for both cans is 2025# and that is approximately where the LAD is set at in the field in the current shutdown condition. The can nearest the crane wall is not labelled but the LAD is in the same location in the indicator window as the other can which is at 2025#. The drawing is in error and will be revised. The error appears to be due to transposition of #'s in the field notes by the As-Built technicians. 2025 written as 2250 Support is correctly set in field and no further evaluation is required.

L.A. Jones 10/16/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-018
Page 1 of 2

Project | Job No. | PSI☐ ISI☒

System: FEEDWATER	Component Name: Support/HANGER	Component ID: 215 J
Drawing/Location: CPL-215 R/0 / Rx. Bldg. El. 251 1/2 El. ABOVE AND NEAR HVE-3 FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		SEE ATTACHED SKETCH
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear	✓		SEE ATTACHED SKETCH
Abnormal corrosion	✓		SEE ATTACHED SKETCH
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		SEE ATTACHED SKETCH
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-30-93

Examiner: N/A Level: N/A Date: N/A

Comments: SEE PAGE 2 of 2 for SKETCH

Reviewed [signature] LIII 9-30-93

(ISI Use Only)
☒ Pass
☐ Fail

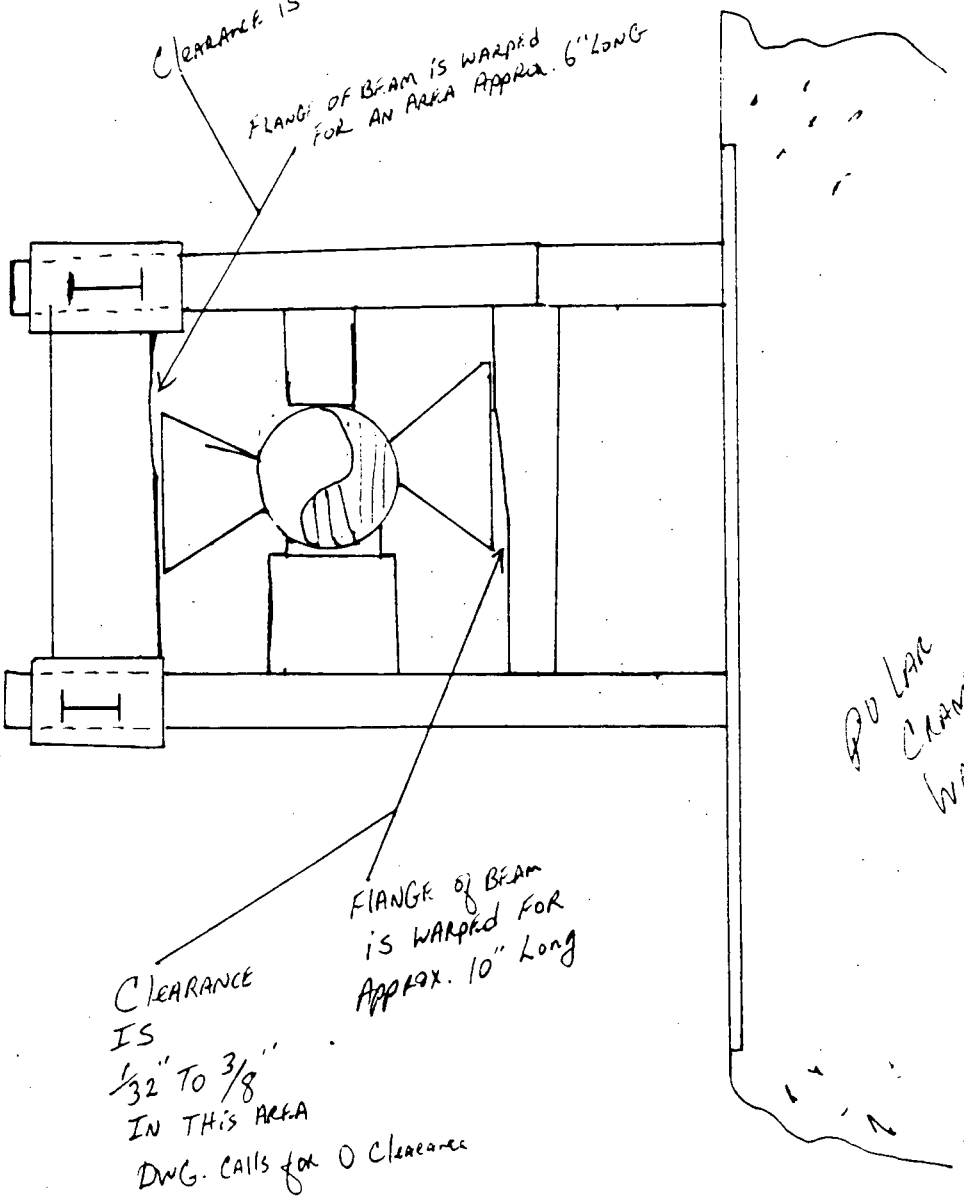
Accepted per Site Memo TSE-93-CD

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

CPL-215 J
Page 2 of 2



Eugene Sing
9-30-93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI-VT-3 Discrepancy

SITE MEMO #	TSE-93-[illegible]-GD
SHEET	OF
MOD M-	
PCN	
RET-R	G93-GQ

Please provide resolution for the discrepancies on CPL-215-J as documented on attached VT-3 inspection report.
FW-5A 20

DISTRIBUTION
Dick Weber

SIGNED: Scott Larson 9-30-93
RESPOND BY:
*RELEASING AUTHORITY: Richard B. Weber DATE: 10/1/93

RESPONSE:
Support is functional as-is. No corrective actions required.

DISTRIBUTION
Dick Weber

SIGNED: E.A. Jones
*RELEASING AUTHORITY: D.M. Dyksterhouse DATE: 10/12/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-215-J Visual Exam Report No. 1230-018

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

The support examined is a seismic 2 way support for 16-FW-9. According to the Line List B-190174 Sh 6 this line is Sch. 100 pipe (1.031" min wall) with a design temp of 500°F and max operating temp of 441°F. The line supplies pre-heated feedwater to 'A' steam Generator. The VT-3 exam and field check by NED were done at cold shutdown with pipe at ambient air temp (80-90°). The excessive rust noted on the VT-3 is cosmetic surface rust that gives no indication of penetrating the structural integrity of the support or pipe. The rust on the pipe is readily removable by rubbing and does not show any sign of localized pitting that could lead to pin hole leaks. The lugs or shims have surface rust only and are of massive enough size and thickness that the relatively even coating of rust due to 23 years of condensation during operation / non operation is insignificant and does not impair the

Wayne Wolfe 11/12/93

E. A. Jones 10/6/93

NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

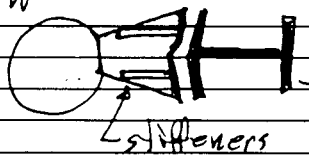
Support ID CPL-215-V Visual Exam Report No. 1230-018

structural integrity of the support or pipe.

The warping of the flanges on the lateral restraint members, while noticeable is structurally insignificant. The webs are unaffected and even the flange damage itself is localized only. It appears to have occurred some time ago as a result of a transient. The damage or warping has resulted in localized clearances exceeding the clearances specified on the design drawing FW-5A-20. At cold shutdown the pipe appears to have rotated clockwise slightly resulting in variable clearances between the lateral lugs and the restraint members (6WF15.5) According to the VT-3 the clearances on the east side of the pipe vary from 1/32" to as much as 3/8" with the maximum occurring in the area where the flange is slightly warped. We measured 0" clr. at the top of the lug. The design drawing specifies 0" clr. The west side clearance varies from 1/8" on the lower half of the lug to 3/8" in the area of localized flange warping. The design drawing specifies 1/8" clearance.

The critical characteristic is that the pipe will be laterally restrained in either direction. While the ideal is full bearing or near bearing between the lugs and 6WF15 it is not required. The areas within the required clearances are adequate to assure restraint of movement. It should be noted that the cumulative gap is 1/8" + 0" = 1/8" as measured by NED, (using VT-3 measurement 1/32" + 1/8 = 5/32" which is still acceptable. HBR2-C-011 allows a tolerance of 1/32" on clearances. A further consideration is the fact that the gaps were measured with the line cold. When the line is in service it will have even less gap due to thermal expansion of the pipe. which can be calculated as $\Delta t \times \alpha \times L = (441-80) \times 16" \times 6 \times 10^{-6} = .034" > 1/32"$ This reduces cumulative lateral gap to .122" < .125" specified without using tolerances.

Checkers Comment: The Pipe lugs or WPA's have a pair of stiffeners. The WPA's were also deflected between these stiffeners due to the relative rigidity of the W sections where the WPA struck (@ web). The web provided rigidity that exceeded that of the WPA between the stiffener. The damage does not render the support dysfunctional



Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-013
Page 1 of 2

Project | Job No. | PSI ☐ ISI ☒

System: FEEDWATER	Component Name: VARIABLE SUPPORT	Component ID: 215-J1
Drawing/Location: CPL-215R/0 / RX. Bldg.-ELEVATION 265'-0" NEAR HVE-3 FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		SEE SKETCH
Abnormal wear	✓		SEE SKETCH
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		SEE SKETCH
Variable/Constant Support	Actual: A)-2775 LBS. B)-3600 LBS.		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-30-93

Examiner: N/A Level: N/A Date: N/A

Comments: THIS SUPPORT IS NEXT TO 215 J WHICH HAD DAMAGE AT THE TIME OF THIS INSPECTION.

Reviewed [signature] LIII 9-30-93

(ISI Use Only)
☒ Pass
☐ Fail

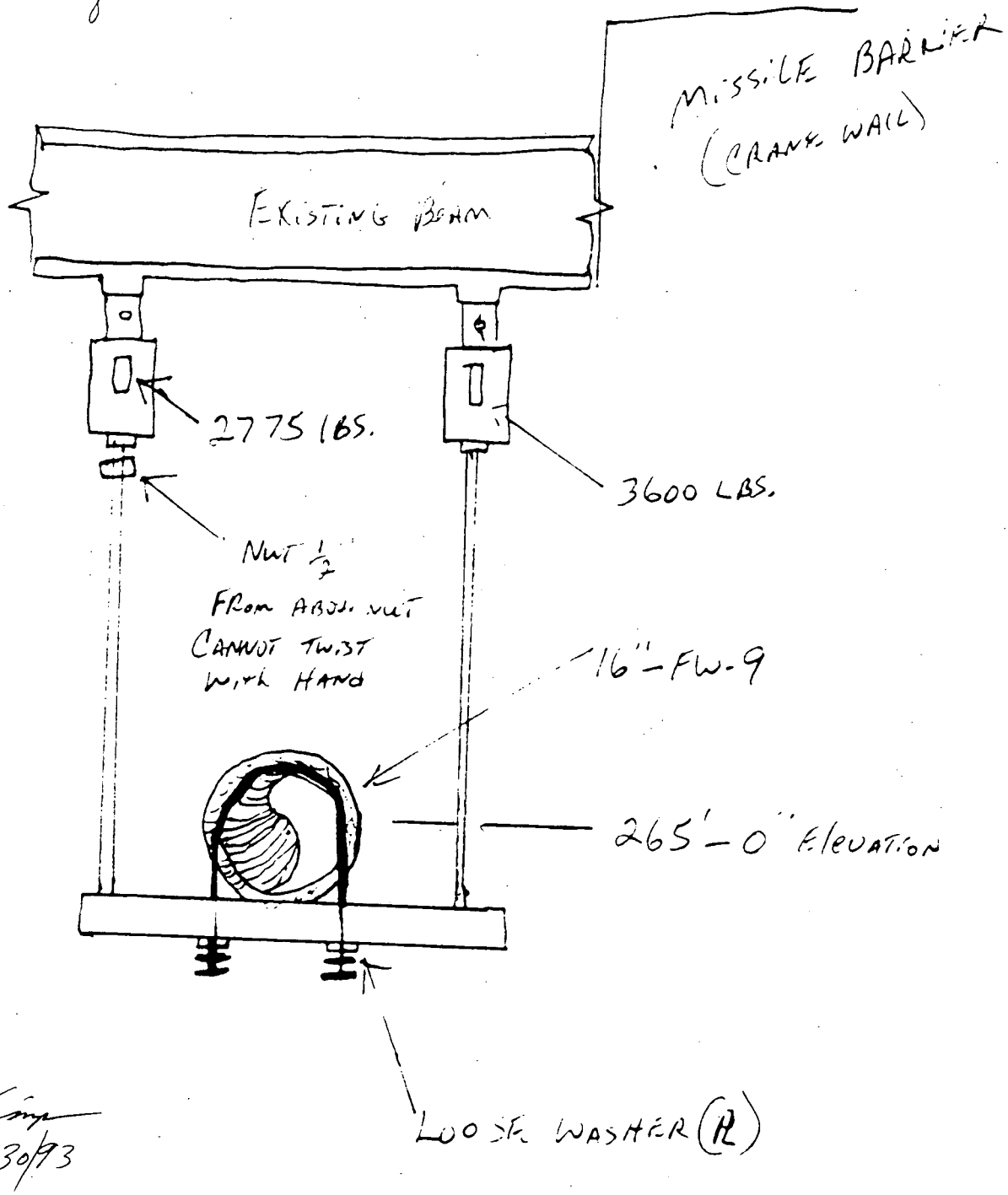
Accepted per Site Memo TSE-93-CE

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 10/30/93

CPL-215 J1
page 292



Eliza Singh
9/30/93

VIEW LOOKING NORTH

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI-VT-3 Discrepancy

SITE MEMO # TSE-93-CE1
SHEET OF
MOD M-
PCN
RET-R G93-GQ

Please provide resolution for the discrepancies on CPL-215-SI as documented on attached VT-3 inspection report:

16-FW-9-SI

DISTRIBUTION
Dick Weber

SIGNED: Scott Lam LTH 9-30-93

RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10-1-93

RESPONSE:
Support is functional as is. No corrective actions required

DISTRIBUTION
Dick Weber

SIGNED: L A Jones

*RELEASING AUTHORITY: K D Dyksterhouse DATE: 10/7/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-215-U1 Visual Exam Report No. 1230-018

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

CPL-215-U1 is a deadweight support w/ spring cans on 16-FW-9. This line has a maximum operating temp. of 441° as it provides preheated feedwater to 'A' S/G. The loose washer fit's are acceptable when it is considered that as a thermal line deadweight support a tight fit U-Bolt is the desired as intended condition. Current design standards for a "loose fit" U Bolt require a single nut on the pipe side of the support member on both legs of the U-bolt to assure 1/16" fit clearance. This allows the primary nut to be torqued without stressing the pipe. This is detailed in Spec. HPR2-C 011. While new installations must meet this criteria it is not critical to original installations. The existing U Bolt has primary and jam nuts but no pipe side for shim nuts but the configuration does provide a loose fit and does not bind pipe. The looseness of the U-Bolt and its washer fit does not in any manner degrade

DW 10/6/93

L. A. Jones 10/6/93

NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-215-V1 Visual Exam Report No. 1230-018

the deadweight integrity of the support. The U-Bolt mainly serves to inhibit uplift on the support but the support is not intended to resist lateral or upward movement. Tightening the nuts sufficiently to eliminate the looseness in the U-Bolt and washer Plates with the line in a cold condition would result in result in undesirable hoop stress in the pipe when the line is heated up and in service at up to 441°F due to thermal expansion.

There was no measurable misalignment noted when VED checked by VED that is out of design tolerance or would impact function of support in a negative manner. No wear was noted that would indicate functional degradation.

The extra nut on the west rod does not adversely impact the support. Lock nuts under the sprius cans are installed correctly. There is no benefit to disconnecting the support in order to remove the extra nut.

Note: The primary and jamb nuts on the U-bolt are not loose and there is plenty of thread beyond them. There is no threat to the U-bolt or nuts dislodging and falling with U bolt and washer if left loose as-is

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-069
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: FEEDWATER	Component Name: Support/Hanger	Component ID: 216-G
Drawing/Location: CPL-216 R/O / RX. Bldg. @ 251'-8" @ PIPE CHASE		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☒ Variable Support

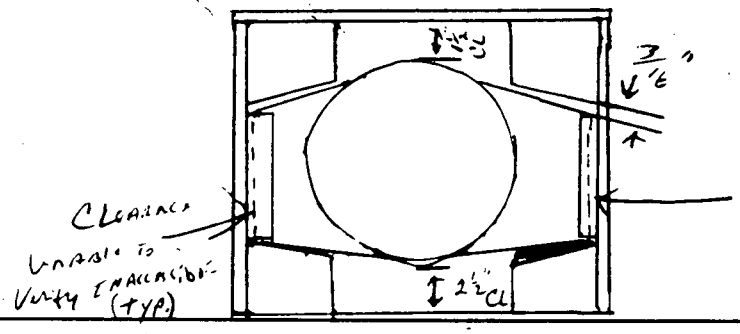
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Eugene Sing Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☒ Pass Accepted per Site Memo T5E-93-EG
☐ Fail

ISI Reviewer: Richard B Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Palladino 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-816 - G as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 - 86
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lin 10-11-93

RESPOND BY:

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/11/93

RESPONSE:
Support is acceptable as is. No corrective actions required

DISTRIBUTION
Dick Weber

SIGNED: C. A. Jones 10/14/93

***RELEASING AUTHORITY:** Jan R Paul **DATE:** 10/14/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-216-G Visual Exam Report No. 1230-069

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None

Basis:
CPL-216-G is Restraint FW-5B-1034 on Stress Iso FW-5B. The support is loaded in Seismic and Thermal. The line has a max operating temperature of 441 according to the line list. The VT-3 measured clearances at top of pipe (1½") and at the bottom (2½") is within the design sketch specification. Note on the drawing specifies that these clearances must be greater than ⅛". This clearance is to allow for some thermal expansion relief in the pipe. The clearance between the WPA and support gusset is specified as ⅛" at top and the VT-3 inspection measured as much as 3/16". The clearance in the field ranges from just under an ⅛" to 3/16". This is insignificant variation. There is no visible damage from or causing the gap variation. It will still restrain upward movement without thermal binding. When thermal expansion is considered on this size pipe the gap is closed quickly. Clearance deviations are not a criteria for declaring a support out of service until repairs unless it is a gap resulting from structural degradation.

10/14/93

E. A. Jones 10/14/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI☐ ISI☒

Project HBR Job No. 93-ARWT1

System: RHR	Component Name: Support	Component ID: 218 A
Drawing/Location: CPL 218 Rev. 0 / Containment 1st Level @ Personnel Hatch Door		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/26/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: [signature] Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII RPCalbadares 10-28-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-024
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RHR	Component Name: VARIABLE SUPPORT	Component ID: 218-A
Drawing/Location: CPL-218 R/O		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

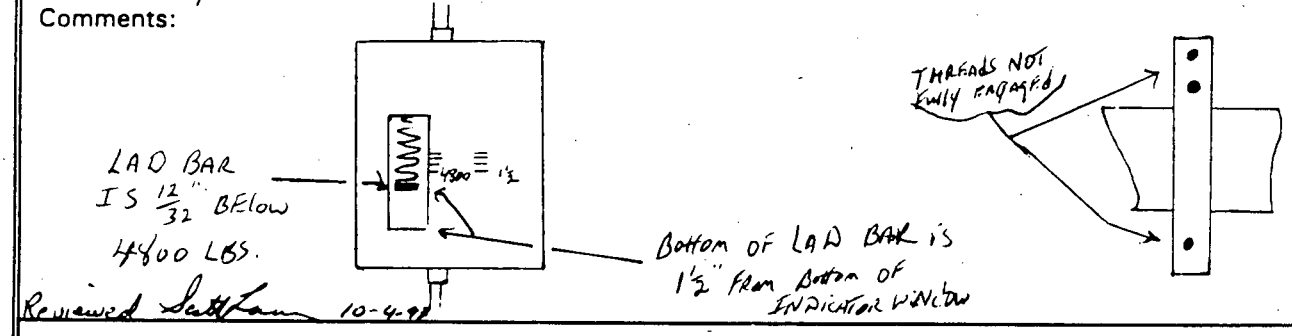
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		LAD BAR IS OFF SCALE
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		SEE SKETCH BELOW
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: OFF SCALE – SEE SKETCH BELOW		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-14-93

Examiner: [signature] Level: ~~II~~ Date: 9-14-93

Comments:



Reviewed [signature] 10-4-93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward, Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-218-SA as documented on attached VT-3 inspection report.

SITE MEMO #: TSE-93-
SHEET: OF
MOD #:
PCN:
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lane 10-4-93

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/4/93

RESPONSE:
Support is Directional. Recommended corrective actions are described on attached SCA/EDS

DISTRIBUTION
Dick Weber

SIGNED: Lelie Jones 10/20/93

*RELEASING AUTHORITY: D. J. Dyksterhouse DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-218-A Visual Exam Report No. 1230-024

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

The bolt and nut on the load pin should tightened to achieve full thread engagement which is end of bolt flush with nut or beyond. Do not exceed torque on the bolt listed in MMM-016 for 1¼" A307 bolt. Threads on bolt and nut may require cleaning prior to torquing. Full thread engagement may be waived if it require torque in excess of MMM-016 requirements.

Basis:

CPL-218-A is Non-Safety Related deadweight support. The load pin is fully capable of transferring load as required. It is only 1½ to 2" threads shy of full thread engage which is not significant, particularly since the bolt is primarily loaded in shear. The threads only have torging tension to assure load pin does not work loose during operation due to vibration, thermal, etc. The bottom clamping bolt is less than ½ thread shy of being flush and is fully capable of supporting deadweight as is. No further evaluation is required. Tightening the load pin up to allowable torque per MMM-016 will bring bolt and nut to original design configuration, but it is not critical to function of support.

The gauge mark stopped labelling @ 4800 lbs on the Grinnel Fig 82 Size 14 B Spring Can

L. A. Jones 10/19/93
NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-218-A Visual Exam Report No. 1230-024

The setting in the field is in the midrange of travel for the spring. There is at least another 1½" of travel available to the bottom. The spring can is at cold load now less corresponding weight of fluid in pipe. It has plenty of travel upward also so it can function as intended. Spring cans are typically sized to have load settings in the mid-range. There is no evidence that the can is damaged or altered in any manner that inhibits its ability to function as intended.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI☐ ISI☒

Project HBR Job No. 93AKXU1

System: RHR	Component Name: Support	Component ID: 218 D
Drawing/Location: CPL 218 Rev 0 / Containment 1st Level		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/27/93 10/28/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Wilder Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

Ann A Wallace 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-023
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: RHR	Component Name: Support/HANGER	Component ID: 218-D
Drawing/Location: CPL-218 R/O		
☒ VT-3 Procedure: SP. 1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

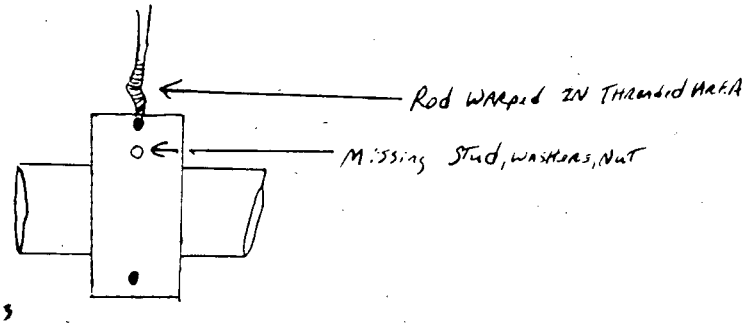
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-13-93

Examiner: [signature] Level: II Date: 9/13/93

Comments:



Reviewed: [signature] 10-4-93

(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard D. Weber Date: 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-2IP -D as documented on attached VT-3 inspection report.

SITE MEMO #: TSE-93 - CK
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lam 10-4-93

RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/4/93

RESPONSE:
Support is function; Recommended corrective actions are described on attached SCA/EDS.

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/12/93

*RELEASING AUTHORITY: James R Paul DATE: 10/22/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-218-D Visual Exam Report No. 1230-023

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
The pipe clamp should be restored to the correct design configration by replacing the missing bolt, nut, and spacer. Bolt should be an A307 GRB or equal, 1" ϕ x 4 1/2" (min length). Nut should be an A563 GRB or equal, Hex or Heavy Hex. Spacer should be 1" sch. 40 S.S. pipe x 1 1/4" long, ME6 std. All material may be Q or Non-Q. The sequence of repair should be as follows: (Recommend repair to be performed with line drained)
① Temporarily back off bottom nut under pipe to open up space between clamp halves. Do not back nut up to less than half the tread engagement. Bolt threads may need cleaning.
② Install the spacer, bolt, and nut using the existing

Basis:
CPL-218-D is a Non-Safety Related deadwt support. The support rod, clamp and load ring are intact and fully capable of carrying the deadwt as intended. The damage to the rod is a slight deflection and flattening of threads just above the weldless eye nut, apparently due to hammer blows during original installation or subsequent maintenance. It has not degraded the structural integrity of the support to any measurable or significant level. The lack of the bolt w/ spacer does not render the support dysfunctional as a deadwt. The rod load nut, clamp, and bottom clamping bolt are the critical load carrying members and they are intact as described. The missing bolt, spacer, and nut should be installed to bring the support into compliance with the vendor and original design configuration. The restoration sequence described above will not require the support to be out of service while being implemented.

L.A. Jones 10/22/93
NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-218-D Visual Exam Report No. 1230-023

bolt hole above the pipe. Space to be between the clamp halves.
(3) Tighten the new bolt with spacer until clamp halves make contact with the spacer.
(4) Tighten the clamping bolt on the bottom under the pipe to remove slack plus 1/2 turn of nut.
(5) Make sure all three bolts and nuts are snug tight against the clamp. Snug tight is defined as taking the full effort of a person using an ordinary wrench.

Locknuts are not required per original vendor design.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-026
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: VARIABLE Support	Component ID: 219A
Drawing/Location: CPL-219 R/O / RX Bldg. -228' Elev. on Crane Wall		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

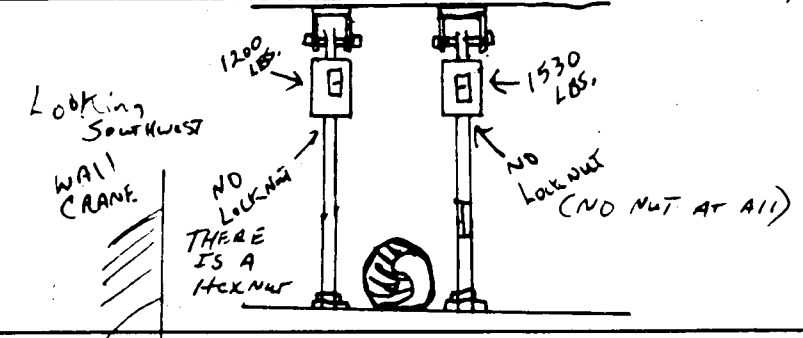
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 1200 LBS (NEAR MISSILE SHIELD WALL)		Other = 1530 LBS.
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Reviewed: [signature] 10-4-93

(ISI Use Only)
☒ Pass
☐ Fail

Accepted per Site Memo TSE-93-CI

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A. Palladino 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-219 -4 as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 -CI
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lucas 10-4-93

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/8/93

RESPONSE:
Support is acceptable as is

DISTRIBUTION
Dick Weber

SIGNED: C. A. Jones 10/21/93

***RELEASING AUTHORITY:** James R Paul **DATE:** 10/21/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-219-A Visual Exam Report No. 1230-026

[✓] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
NONE

Basis:
UPON FIELD INSPECTION IT WAS DETERMINED THAT THE FIG 268 SPRING CAN HAS COUPLING NUT (FIG 135) INSTALLED. THE COUPLING NUT IS TIGHTENED AGAINST THE NUT (WHICH IS SUPPLIED WITH THE SPRING CAN) WITH A THREADED ROD PROJECTING OUT OF THE BOTTOM WITH NO LOCKING NUT. IT IS APPARENT THAT THE ROD IS IN TENSION & FUNCTIONING PROPERLY. NO LOCKNUT IS REQUIRED DUE TO THE ROD BEING LOCKED AT THE CHANNEL SECTION WITH 2 NUTS AND THE TENSION PLACED ON THE COUPLING / ROD. THE MISSING LOCKNUT WILL NOT IMPAIR THE HANGER. THE FIG 82 SPRING CAN HAS A SIMILAR SITUATION TO FIG 268. THERE IS A SMALL SECTION OF THREADED ROD EXTENDING OUT OF THE SPRING CAN WHICH IS ATTACHED TO THE MAIN ROD VIA FIG 136 ROD COUPLING WITH NO LOCKNUT. IT IS APPARENT THAT THE ROD IS IN TENSION & FUNCTIONING PROPERLY. NO LOCK NUTS ARE REQ DUE TO THE ROD BEING LOCKED AT THE CHANNEL SECTION WITH 2 NUTS AND TENSION PLACED ON THE COUPLING / ROD.
NED WILL REVISE THE DRAWING TO REFLECT ACTUAL CONDITION.

Wayne Doolittle 10/21/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-022A
Page 1 of 1
PSI☐ ISI☒

Project Job No. 93-AKGU1

System: SI	Component Name: Hanger	Component ID: 219 C
Drawing/Location: CPL-219		
☒ VT-3 Procedure: Rev.	☐ VT-4 Procedure: Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other ____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber N/A	Actual:	Stroke:	S/N

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Scott Lowe Level: III Date: 10-20-93

Examiner: N/A Level: N/A Date: N/A

Comments: Reexamined after repair.
WR 93-AKGU1

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard D. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

A VII R Valladares 10/27/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-022
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: SI	Component Name: Support/Hanger	Component ID: 219C
Drawing/Location: CPL-219 R/O / Rx Hdg. -228' E/W. Crane wall		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

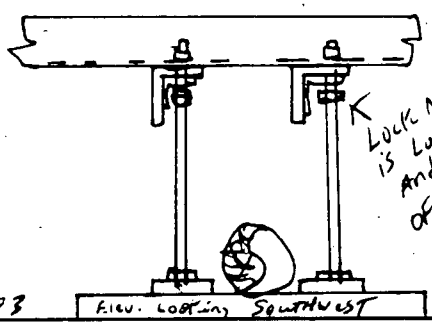
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	~~✓~~ BS 10-2-93	✓	~~Sat~~ SS 10-2-93
Loose/missing parts	✓		LOCKNUT LOOSE (CAN BE HAND TURNED)
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☑ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-2-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Reviewed [signature] LEVEL 10-4-93

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-219-C as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-C
SHEET OF
MOD #
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lamm 10-4-93

***RELEASING AUTHORITY:** Richard D. Weber **DATE:** 10/4/93

RESPONSE:
Support is functional. Recommend corrective action is described on attached SCA/EDS.

DISTRIBUTION
Dick Weber

SIGNED: C. A. Jones 10/5/93

***RELEASING AUTHORITY:** [signature] **DATE:** 10/8/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-219-C Visual Exam Report No. 1230

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
The loose locknuts should be tightened to a "snug tight" condition against the support steel. (snug tight being that nut cannot be removed with fingers.

Basis:
The support is a Non-Safety Related, deadweight support on BSL-3B. The primary or load nuts are intact with plenty of threads beyond the nut therefore the deadweight load capacity or function of the support was and is intact. The tightening of the locknuts will put a desired slight tightening tension in the rod that will prevent operational vibration from working the load nuts loose.

C.A. Jones 10/28/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System:	Component Name: Support/Hanger	Component ID: 219A-O
Drawing/Location: CPL-219A R/	/ex. Bldg. Excell 1st floor Area - 228' Floor Elev.	
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

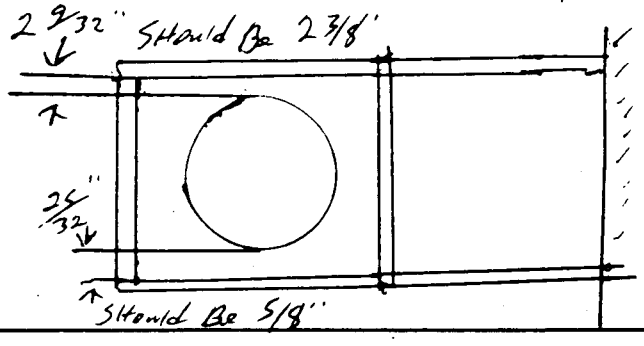
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		See Sketch Below
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Shyam Singh Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-CY-

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-2118 - 0 as documented on attached VT-3 inspection report.

SITE MEMO #: TSE-93 - C
SHEET OF
MOD #:
PCN:
RET-RG93-GQ

DISTRIBUTION:
Dick Weber

RESPOND BY:

SIGNED: [signature] 10-11-93

***RELEASING AUTHORITY:** [signature] **DATE:** 10/11/93

RESPONSE:
Support is acceptable as is

DISTRIBUTION:
Dick Weber

SIGNED: [signature] 10/13/93

***RELEASING AUTHORITY:** [signature] **DATE:** 10/15/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-219A-O Visual Exam Report No. _____

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

CPL-219A-O is a lateral seismic restraint detailed on SI-2-412. The clearances in the 'Z' direction of restraint are per the drawing. The support is not a restraint in the 'Y' direction therefore the cumulative clearances are much greater than in the 'Z' direction. The cumulative per design drawing is 3" total to allow for possible vertical thermal movement, etc. The cumulative measured per VT-3 is $2\frac{9}{32} + \frac{27}{32}$ which $= 3\frac{1}{16}" \approx 3"$. The pipe is restrained per design and allowed room to move in 'Y' as needed.

Wayne Dortch 10/14/93

L.A. Jones 10/13/93

NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page i of 1
PSI☐ ISI☒

Project HBR Job No. 93-AKWU1

System: SIS & RHR Return	Component Name: Support	Component ID: 219 A P
Drawing/Location: CPL 219A Rev 0 / Containment 1st level		
☒ VT-3 Procedure: 616 Rev. 1		☐ VT-4 Procedure: N/A Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/26/93

Examiner: Level: Date:

Comments: Inspection after rework
Per Site Memo # TSE-93-CX, nuts missing on top of channel IKON is acceptable as long as jam nut are on the bottom nuts. JT 10/26/93

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 10-28-93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: SUPPORT/HANGER	Component ID: 219A-P
Drawing/Location: CPL-219A - R/O / RX. BLDG. -228'-FLOOR ELOW - EXCESS LETDOWN AREA - "C" ACCUM S.E.		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger
☐ Constant Support ☐ Variable Support

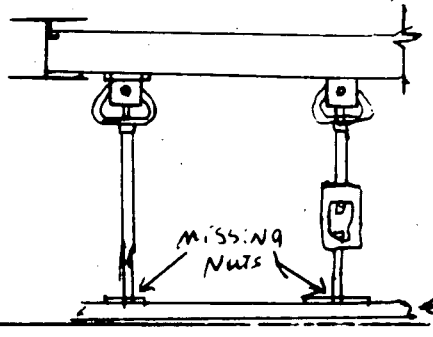
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		See SKETCH BELOW
Loose/missing parts	✓		See SKETCH BELOW
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-10-93

Examiner: N/A Level: N/A Date: N/A

Comments:



(ISI Use Only)
☐ Pass
☑ [illegible]

ISI Reviewer: [signature] 10/27/93

[illegible]

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-219A - P as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 - CX
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lain 10-11-93

***RELEASING AUTHORITY:** Richard O. Weber **DATE:** 10/11/93

RESPONSE:
Support is functional; Recommend corrective actions are described on the attached SCA/EDS

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/19/93

***RELEASING AUTHORITY:** K.D. Dyksterhouse **DATE:** 10/20/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-219A-P Visual Exam Report No. —

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

Snug tight the load nuts under the JE3x4.1 and add locknuts (Non-Q) snug tight against the load nuts. Use A-563 GR B or equal nuts. Threads on rod below loadnuts may be staked in lieu of adding locknuts. Copy of closed out WR with info on whether locknuts were added or ends staked should be routed to NED Civil for updating the As-Built drawing.
Snug tight is defined as that condition where the nuts cannot be removed by fingers.

Basis:

CPL-219A-P is a Non-Safety Related deadweight support. Its function as a deadweight support is not impaired by the lack of locking nuts above the JE3. The load nuts are fully engaged and intact as found. Making sure the load nut is snugged up and adding locknuts or staking threads will provide the added assurance that the load nut never will work loose. This is inherent in current design guides.

E.A. Jones 10/19/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-049
Page 1 of 1

Project HBR2 Job No. PSI ☐ ISI ☒

System: S.I.	Component Name: SUPPORT	Component ID: B
Drawing/Location: CPL-234B		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support	X	N/A	CLEARANCE IS "ZERO"
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth L. Kane Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
✓ Pass
Fail
Accepted per Site Memo TSE-93-CN

ISI Reviewer: Richard B. Weber 10/28/93

CAROE ISI 11, Rev. C, 07/93

ANII A. P. Valladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-234B-1B as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-GN
SHEET OF
MOD #
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Kam

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/6/93

RESPONSE:
Support is functional and acceptable as is. The As-Built dwg. will be corrected by NED.

DISTRIBUTION
Dick Weber

SIGNED: L. A. Jones

***RELEASING AUTHORITY:** [illegible] **DATE:** 10/9/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-234B-B Visual Exam Report No. 1230-049

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None by Plant Maintenance / Tech Support. NED will revise the As-Built drawing to indicate the correct bottom clearance as 0"

Basis:
The support is a deadwt. trapeze hanger on a line that has and is undergoing hanger modifications upstream and downstream of CPL-234B-B. The support was field As-Built on 9/18 and 1/4" bottom clearance noted. The VT-3 on 10/5/93 and followup field check by NED to be 0" bottom clearance which is the proper clearance for a deadweight support. Apparently activities down the line had temporarily lifted the line off the pipe hanger at the time of the As-Built effort. The drawing should be corrected. No further evaluation is required. The support is Non-Safety Related.

T. A. Jones 10/19/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI☐ ISI☒

Project HBR Job No. 93-AKX91

System: SIS	Component Name: Support	Component ID: 245 D
Drawing/Location: CPC 245 / Containment 1st level		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10/27/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AWH 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-057
Page 1 of 1
PSI ☐ ISI ☒

Project HBR2 Job No.

System: ~~Aux Cooling Sys~~ S.I.S. RCN 93-03	Component Name: SUPPORT	Component ID: D
Drawing/Location: CPL-245		
☒ VT-3 Procedure: SP-1230 Rev. 0	N/A VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support N/A Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts	X	N/A	U-BOLT NUTS LOOSE
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth R. Hane Level: II Date: 10-5-93

Examiner: N/A Level: N/A Date: N/A

Comments:

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B. Weber 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-245 - D as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 - CO
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lamm 10-6-93

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/6/93

RESPONSE:
Support is functional. Corrective action recommended is described on attached SCA/EDS.

DISTRIBUTION
Dick Weber

SIGNED: A. A. Jones 10/21/93

***RELEASING AUTHORITY:** Jan R Paul **DATE:** 10/22/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-245-D Visual Exam Report No. 1230-051

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
Replace the square nut on one leg of the U-Bolt with 1/4" A-563 6RB hex nut or equal (or size to match U-Bolt leg). Add oversize flat washers under nut on each leg as required to assure nut is torqued against both support angles. Torque both nuts 32-36 in-lbs. (Torque for 5/16" U-bolt is 60-65 in lbs; 115-125 in lbs for 3/8" U-bolt. The ends of the U-Bolt threads shall be staked. Nuts and washers are Non-Q

Basis:
The support for CPL-245-D is acceptable as is with no indications. The indication on the VT-3 is for a loose U-Bolt on 2-AC-40B which is a non-thermal cooling water line from RCP 'A' Bearings. This line is supported on the same hanger as CPL-245-D. 2-AC-40B is an unanalyzed line that is supported per original Ebasco charg method. The support function on the CPL-245-D hanger is one of Non-Safety Related deadweight. There is a seismic restraint just downstream on the vertical run and upstream on the horizontal run. The U-Bolt looseness does not impair the deadweight function of the support but since the U-Bolt is only 1" from the end of the support and is the support is only 23" from the pipe turning down it would be prudent to tighten the U-Bolt as described above to prevent any incidental movement of pipe from knocking it off the deadweight support. Given the lack of thermal movement (120° max) thermal binding due to tightening is not an issue

L. A. Jones 10/22/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-065
Page 1 of 1

Project HBR2 Job No.

PSI ☐ ISI ☒

System: S1	Component Name: SUPPORT	Component ID: A
Drawing/Location: CPL-246-A		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight N/A Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	N/A	X	NO INDICATIONS NOTED
Mechanical interference		X	" " "
Cracks		X	" " "
Missing attachment/hardware		X	" " "
Loose/missing parts		X	" " "
Abnormal wear		X	" " "
Abnormal corrosion		X	" " "
Abnormal gouges		X	" " "
Arc Strikes on sliding support		X	" " "
Misalignment of the support		X	" " "
Variable/Constant Support FIG. 247	Actual: 1/8"		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: Kenneth R. Hance Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: HOT/COLD SETTING NOT SPECIFIED ON SPRING CAN.

(ISI Use Only)
☑ Pass Accepted per Site Memo TSE-93-EE-
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII A Valladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

SITE MEMO # TSE-93-EE
SHEET OF
MOD NO.
PCN
RET-RG93-GQ

Please provide resolution for the discrepancies on CPL-246-M as documented on attached VT-3 inspection report.

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lamm 10-11-93

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/11/93

RESPONSE:
Support as Accept As Is

DISTRIBUTION
Dick Weber

SIGNED: 10/21/93

*RELEASING AUTHORITY: Jon R Paul DATE: 10/21/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID (ISI) CPL-246-A Visual Exam Report No. 1230-065

[✓] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

SUPPORT IS A LIGHT DUTY SPRING, MAX LOAD 85# MAX MVMT 1¼" PER GRINNELL FIG. 247, SZ 2. PER STRESS CALC 4007 (ISO 58-7) THE THERMAL MVMT = -.452" FOR NODE 6012. BY INSPECTION OF THE SPRING CAN THERE IS ADEQUATE TRAVEL AVAILABLE TO ACCOMMODATE THE CALCULATED THERMAL MVMT. Support is Non-Safety Related deadweight.

NED Engineer 10/21/93 Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-119
Page 1 of 2
PSI ☐ ISI ☒

Project NBR Job No.

System: HPSIS	Component Name: Support	Component ID: 246 "G"
Drawing/Location: CPL 246 Rev 0 / Containment 1st Level		
☒ VT-3 Procedure: NDEP 616 Rev. 1	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Constant Support ☐ Mechanical Snubber ☒ Variable Support ☐ Support/Hanger	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 5/8"		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] PETTINGEN Level: II Date: 10/21/93

Examiner: N/A Level: N/A Date:

Comments: Support was originally inspected as CPL 246 "C". During the walkdown with the maintenance personnel to collect the adverse conditions, it was noted that 246 "G" was actually inspected. This report documents the inspection of CPL 246 "G". Report # 1230-116-1A documents the inspection on 246 "C".

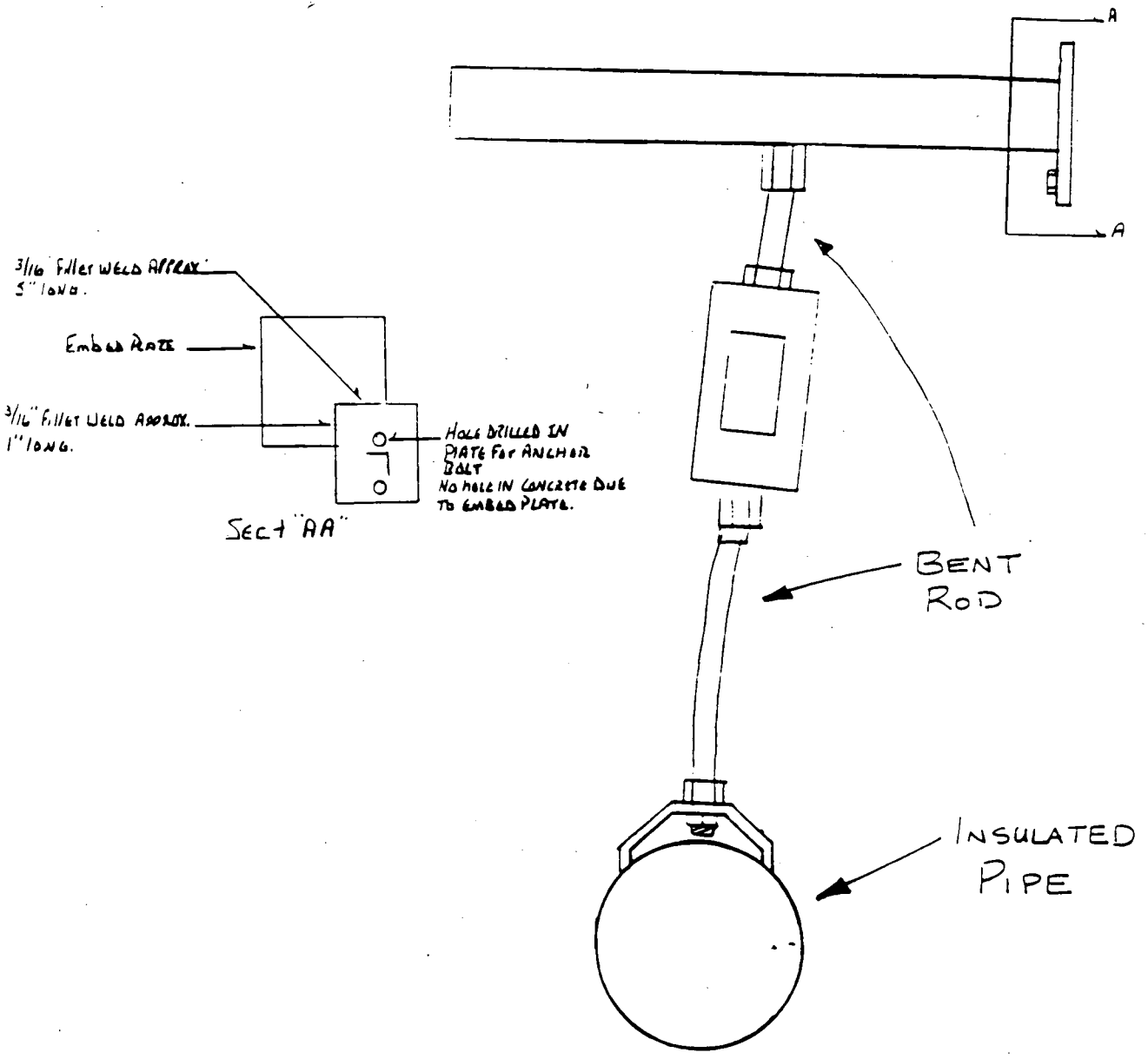
Reviewed [signature] 10-21-93 LIII

(ISI Use Only)
☐ Pass
☑ Fail

Note: Acceptable as is per Site Memo TSE-93-EN

ISI Reviewer: [signature] Date: 10/28/93

 ANII [signature] 10/28/93



CPL-246, REV 0

Support "G"

10/21/93

ATTACHMENT 1
PAGE 1 OF 2

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-24C-G as documented on attached VT-3 inspection report.

SITE MEMO
TSE-93-EN
SHEET OF
MODIM-
PCN
RET-RG98EGQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED:

*RELEASING AUTHORITY: Richard B. Weber DATE: 10/21/93

RESPONSE:
Support is acceptable as is

DISTRIBUTION
Dick Weber

SIGNED: T.A. Jones 10/21/93

*RELEASING AUTHORITY: K.B. Dykterhouse DATE: 10/22/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-246-G Visual Exam Report No. 1230-119

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None

Basis:
CPL-246-G is a Non-Safety Related deadwt support. The load nuts are in place and the cross section area has not been adversely reduced or deformed by the slight bends in the rod. The support is fully capable of carrying deadwt as designed. The rod is in moderate tension as it should be for a deadwt. No further evaluation is necessary

C.A. Jones 10/21/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-064
Page 1 of 2

Project HBR2 Job No.

PSI☐ ISI☒

System: S1	Component Name: SUPPORT	Component ID: C
Drawing/Location: CPL-246		
☒ VT-3 Procedure: SP-1230 Rev. 0		N/A ☒ VT-4 Procedure: N/A Rev. N/A
Direct ☒ Remote N/A	Video Recording No.: N/A	☒ N/A
Equipment Used: N/A Scale ☒ Flashlight ☒ Mirror ☒ Other NEUTRAL GRAY CARD	Type of Component Support: N/A Hydraulic Snubber N/A Mechanical Snubber ☒ Support/Hanger N/A Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	X	N/A	SEE ATTACHED DRAWING
Mechanical interference	N/A	X	NO INDICATIONS NOTED
Cracks	N/A	X	" " "
Missing attachment/hardware	X	N/A	ANCHOR BOLT MISSING
Loose/missing parts	X	N/A	NUTS LOOSE
Abnormal wear	N/A	X	NO INDICATIONS NOTED
Abnormal corrosion	N/A	X	" " "
Abnormal gouges	N/A	X	" " "
Arc Strikes on sliding support	N/A	X	" " "
Misalignment of the support	N/A	X	" " "
Variable/Constant Support FIG. 247	Actual: 7/8" SETTING		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

N/A ☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

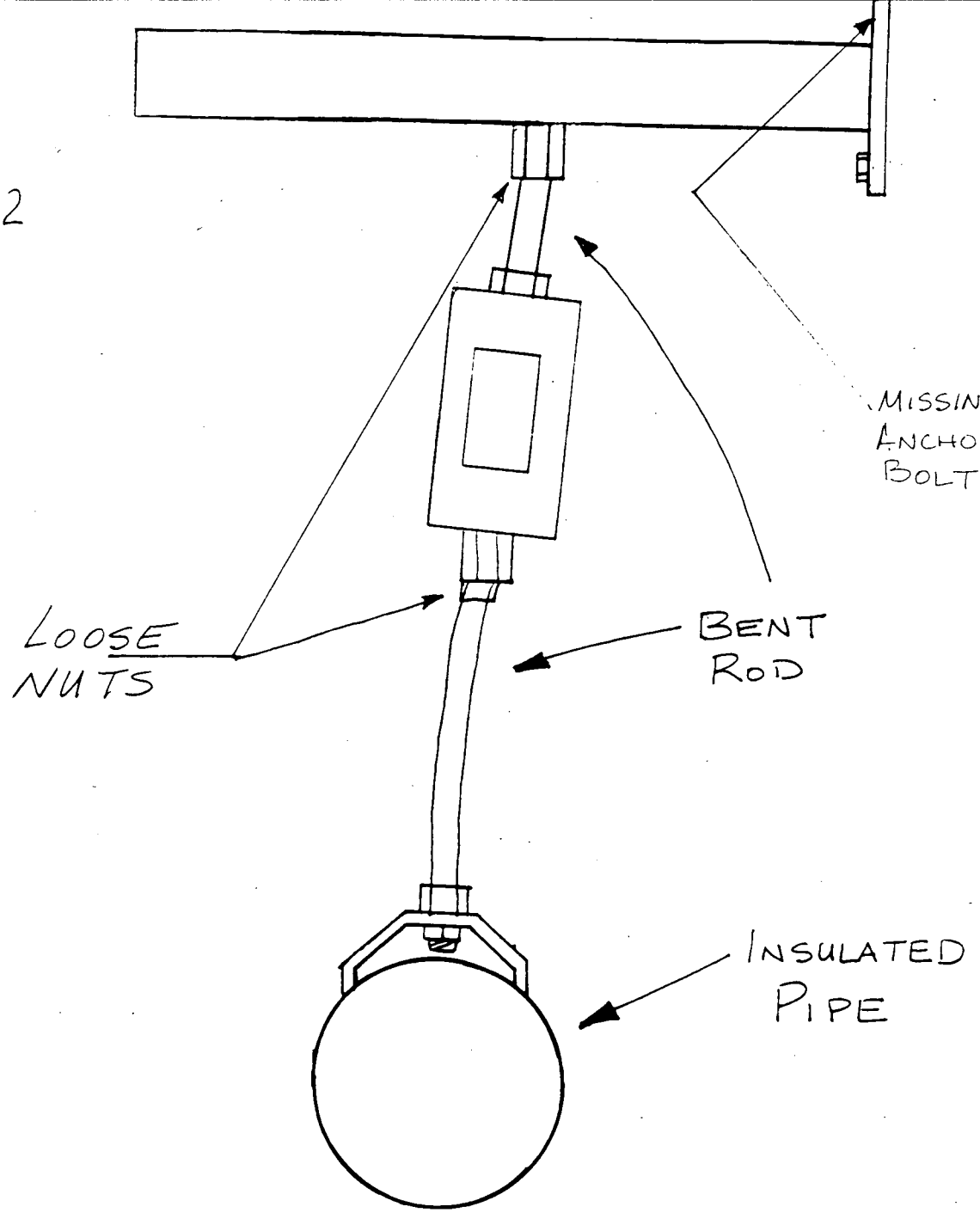
Examiner: Kenneth A. Hance Level: II Date: 10-7-93

Examiner: N/A Level: N/A Date: N/A

Comments: See Report 1230-119 dated 10/21/93
PT 2/2/94

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B Weber Date: 10/27/93



CPL-246, REV 0

SUPPORT C

Kenneth L. Hance LEVEL II 10-7-93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-246 - C as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93
SHEET ONE
MOD #
PCN
RET-RG93-GO

DISTRIBUTION
Dick Weber

RESPONDENT

SIGNED: Scott Lam 10-11-93

***RELEASING AUTHORITY:** Richard B Weber **DATE:** 10/11/93

RESPONSE:
Support is functional short term, Required corrective actions are described on attached SCA/EDS

DISTRIBUTION
Dick Weber

SIGNED: C. A. Jones 10/14/93

***RELEASING AUTHORITY:** Jan R Paul **DATE:** 10/15/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-246-C Visual Exam Report No. _____

[ ] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[X] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
Replace the missing bolt with a ½" ϕ A307 (or better) hex head bolt (Q). Bolt length should be at least 1" with a minimum thread engagement in the anchor sleeve of at least ½". Now Q flat washers shall be used as required (at least one) to assure no gap between bolt head and the base plate. The bolt and the loose nuts on the support rods should be tightened to a "snug tight" condition. Snug tight is all connecting parts are in contact and firm resistance to further tightening is encountered with nuts or bolt not removable using fingers. The bent rods May be replaced with ⅜" ϕ A-36 all thread rod with lengths cut to suit. Rod replacement is not a "must be performed" action.

Basis:
The support is classified as a Non-Safety Related deadweight support that is anchored on a Cat I wall. Replacement of the bolt and washers and tightening the nuts will return the support to its original design configuration. The bent rods are not significantly damaged and are continuing to function in carrying deadweight. Functional status of the support "as is" for short term is evaluated as follows:

The loose nuts are not load carrying components. They are locknuts to assure adequate tension in all the connections to minimize chances of connections working loose during operational service.

While the HL/CL settings are not labeled on the springs can the ⅞" setting is well within the mid range of the spring can travel window therefore it is functioning as intended with travel available up or down.

(see next page)

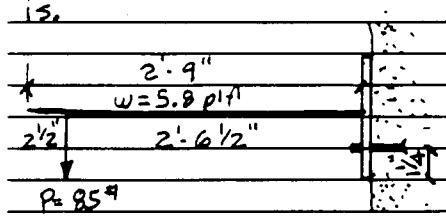
Dayne Doolittle 10/14/93

C. A. Jones 10/14/93
NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-246-C Visual Exam Report No. _____

The missing upper bolt will put a significantly increase pullout and shear load on the remaining lower bolt which ordinarily be in compression and shear when the upper bolt is in place. While the actual load will be less the maximum rating of 85 lbs for the spring can will be used to determine the forces on the remaining bolt for functional status of support as is.



$M = \frac{2.75^2(5.8)}{2} + (2.5416')(85\#) = 238'\# = 2855"\#$

Pullout on bolt, $T = 2855"\#/(2/3)(1.25") = 3426\#$

Per DG II.1 T, Ultimate on ½" SAB is 8925#

Using F.S. of 2 for short term operability $T_a = 8925/2 = 4463 > 3426\#$

Shear, $S = 85\# + 2.75' \times 5.8 plf = 101\#$ Ultimate Shear on ½" SAB = 7661#

$S_a = 7661/2 = 3831 > 101\#$

Interaction: $3426/4463 + 101/3831 = 0.794 < 1.0$ bolt is ok using short term qualification

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1
PSI ☐ ISI ☒

Project NBR Job No. 93AKXS1

System: SI	Component Name: Support	Component ID: 247 C
Drawing/Location: CPL 247 Rev 0 / Containment 1st level		
☒ VT-3 Procedure: 616 Rev. 1	☐ VT-4 Procedure: N/A	Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Peter [illegible] Level: II Date: 10/27/93 A 10/27/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AWH RBWeber 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-056
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SI	Component Name: Support/Hanger	Component ID: 247C
Drawing/Location: CPL-247 R/C/Rx. Bldg. 228' Elev. Near Penetration Area		
☒ VT-3 Procedure: Sp-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

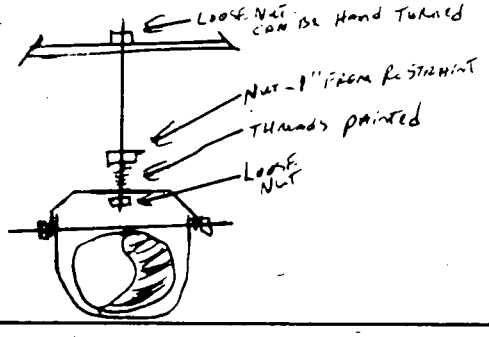
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Component NOT TAGGED (I.D.)

(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy
Please provide resolution for the discrepancies on CPL-247 - C as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93 - CT
SHEET OF
MOD #
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lauer 10-7-93

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/7/93

RESPONSE:
Support is functional short term. Required corrective actions are described on attached SCA/EDS.

DISTRIBUTION
Dick Weber

SIGNED: C.A. Jones 10/21/93

***RELEASING AUTHORITY:** Jan R Pane **DATE:** 10/21/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-247-C Visual Exam Report No. 1230-056

[ ] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[X] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
The rod shall be retensioned by tightening the load bearing nut on the clevis and at the top of the rod as required to induce a moderate level of tension in the rod. Make sure the washer plate under the top load nut is squared up with the JC3 building steel supporting it. The locknut on the clevis should be made snug tight after rod is tensioned. Add a locknut to the top end of rod snug tight against the top load nut. Nut should be hex nut A-563 GRB or equal, Q or Non-Q. All nuts should be snug tight which is defined as the nut is not removable using fingers.

Basis:
CPL-247-C is a Non-Safety Related deadweight support on 2SI-63 identified on the Stress Iso as SI-6-6003 (H3). The support is not damaged but the nuts are loose. The load nuts are fully engaged and therefore fully capable of carrying the full load intended. The support is functionally capable of providing deadwt. support as is but with the rod lacking tension its present mode of load transfer is marginal therefore the retensioning of the rod is a neccessary repair to return the support to full design configuration as a deadweight support. The presence of a spring can support only 6% of the applied deadload at cold shutdown on this support. Its rod has good tension.

C. A. Jones 10/21/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-055 A
Page 1 of 1

Project Job No. 93 AKNR1 PSI☐ ISI☒

System: SI	Component Name: Variable Support	Component ID: 247 D
Drawing/Location: CPL 247		
☒ VT-3 Procedure: SP 1230 Rev. 0	☐ VT-4 Procedure: N/A Rev.	
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger ☐ Constant Support ☒ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: 1 1/4" from window bottom edge		
Snubber N/A	Actual:	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: Scott Lam Level: II Date: 10-20-93

Examiner: Level: Date:

Comments: Examined after repair. See WR 93 AKNR1

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard D. Weber Date: 10/27/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Balladares 10-28-93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-247-D as documented on attached VT-3 inspection report.

SITE MEMO #	TSE-93-65
SHEET	OF
MOD M-	
PCN	
RET-RG93-GQ	

DISTRIBUTION:
Dick Weber

RESPOND BY:

SIGNED: Scott Lam 10-7-93

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/7/93

RESPONSE:
Support is functional. Recommended corrective actions are described on attached SCA/EDS

DISTRIBUTION
Dick Weber

SIGNED: A. Jones 10/14/93

***RELEASING AUTHORITY:** James R Paul **DATE:** 10/15/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-247-D Visual Exam Report No. 1230-055

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
Tighten the spring can locknut and both load nuts to a snug tight condition to point where rods have slight tension (not loose).

Basis:
CPL-247-D is a Non-Safety Related deadwt support with spring can. The load nuts are in tact as is and therefore fully capable of carrying load to the capacity of the rod and certainly that of the spring can. Tightening to snug tight to tension the loose rod will restore the support to full design condition. The slight bend in the upper rod does not degrade the structural integrity or ability of the rod to carry deadwt. The lack of a marker with load setting identification does not degrade the ability of the spring can to function. There is no visible damage to the can or its working components. Based on the field measured dimensions of the can the spring can appears to be a light duty Fig 247 Grinnell size 1 which has a max load of 47.7# with max deflection of 1 1/4". Spring cans are normally selected with the design load setting to be in the mid-range of the travel load window. The can is set within the mid-range of the can in the field.

L.A. Jones 10/15/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-021
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SERVICE WATER	Component Name: SUPPORT/HANGER	Component ID: 324-A
Drawing/Location: CPL-32 R/1 / RX Bldg Elev 271' Area: HVH-5B FAN		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

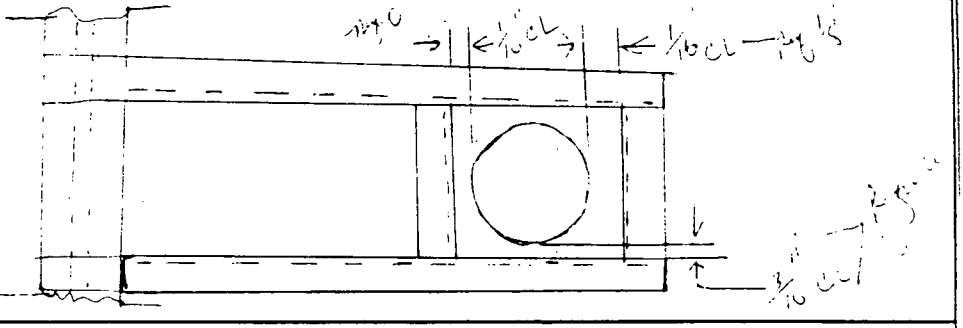
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	SLIGHT RUST ON ANGLES IRON
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Required [signature] LHH 10-2-93

(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-CF

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII RP Valladares 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-324 - A as documented on attached VT-3 inspection report. SW-7-24/11

SITE MEMO #	TSE-93-[illegible]-CF
SHEET	OF
MOD #	
PCN	
RET-R	G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Thomas 10-2-93

***RELEASING AUTHORITY:** Leonard D. Weber **DATE:** 10/2/93

RESPONSE:
Support is acceptable as is. No corrective action

DISTRIBUTION
Dick Weber

SIGNED: L A Jordan 10/5/93

***RELEASING AUTHORITY:** _____ **DATE:** / /

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-324-A Visual Exam Report No. 1230-021

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

The design drawing SW-7-241 11 showed 1/8" clearance to the east of the pipe and 0" to the east. According to the VT-3 inspection the as found condition was 1/16" clearance on both sides which is still 1/8" cumulative. According to RNP current design/construction acceptance criteria in HBR 2-C-011 1/16" on each side is the standard with cumulative total of 1/8" max. The existing clearances are acceptable applying this criteria. The VT-3 recorded clearance on the south side of the pipe was 3/16" with no recording of north side clearance. The clearances were checked by NED on top and bottom of the restraint on all four sides. Our field measurements were 0" clearance to visual clear only on the northside and 1/8" on southside. This is also consistent with the current C-011 criteria. Support is functional as is. There is no visible damage or deflection in the support members that would have adversely altered the clearances on the support. It should be further noted that per ~~IWF~~ IWF 3400

10/7/93

NED Engineer Date

SUPPORT EVALUATION ACTION/EVALUATION DOCUMENTATION SHEET (CONT.)

Support ID CPL-324-A Visual Exam Report No. 1230-021

pipe clearances are not included in the condition or acceptance standards for determining component support structural integrity for continued service. Degradation that results in excessive or less than specified clearances in a manner that degrades structural integrity would be an rejectable indication requiring repair or engineering evaluation to permit continued service.

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230 020
Page 1 of 1

Project | Job No. | PSI☐ ISI☒

System: SERVICE WATER	Component Name: SUPPORT/HANGER	Component ID: 324-C
Drawing/Location: CBI-324 C/1 / 1A Bldg. Elev. 249.5		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

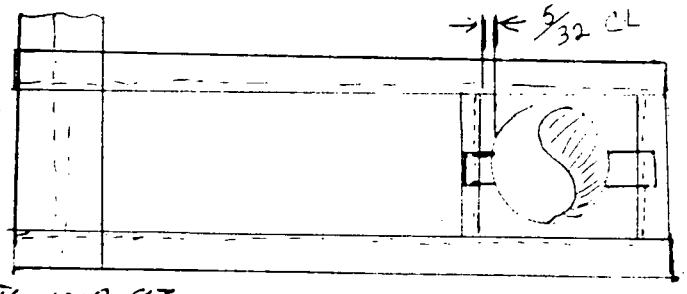
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support	✓		Requires A O CL See Sketch Below
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-1-93

Examiner: N/A Level: N/A Date: N/A

Comments:



Reviewer: [signature] 10-2-93

(ISI Use Only)
☑ Pass
☐ Fail

Accepted per Site Memo TSE-93-CE

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII [signature] 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

SITE MEMO #	TSE-93 - CS
SHEET	OF
MOD #	
PCN	
RET-R	G93-GQ

Please provide resolution for the discrepancies on CPL-324-C as documented on attached VT-3 inspection report: SW-7-24/9

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lamm 10-2-93

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/2/93

RESPONSE:
Support is functional as is. No corrective actions required

DISTRIBUTION
Dick Weber

SIGNED: C. A. Jones 11/7/93

***RELEASING AUTHORITY:** [illegible] **DATE:** 10/9/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-324-C Visual Exam Report No. 1230-020

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:
None

Basis:
Support is detailed on drawing SW-7/24/9 with 0" clearances on North and South sides of pipe. Support is a three way restraint. The clearances were checked by NED on the top and bottom of support. The lugs on the north and south sides of the pipe at top and bottom inhibit access for accrate clearance at tangent of pipe but 1/8" was the max clearance we measured on the north side of pipe at top. 1/8" cumulative gap is acceptable under criteria in HBR2-C-011 specifications used in current design/construction. There are no signs of support member degradations that would cause excessive gaps and render support dysfunctional. The pipe was replaced in 1988-89 with AL-6XN that was fabricated from plate resulting in very slight deviations in the shape of the pipe. This would account for difficulty in measuring uniform clearances. Support is functional as is. Also pipe clearances without evidence of structural integrity degradation is not a IWF-3400 criteria for considering pipe support dysfunctional and unavailable for continued service without repair.

L. A. Good 10/7/99
NED Engineer Date
BR

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. _____
Page 1 of 1

Project HBR Job No. 93AKW21 PSI☐ ISI☒

System: SW	Component Name: Support	Component ID: 324BD
Drawing/Location: RL 324B Rev 11 | Containment | 1st Level @ 51 Penetration		
☒ VT-3 Procedure: 616 Rev. 1		☐ VT-4 Procedure: N/A Rev.
Direct ☒ Remote ☐	Video Recording No.:	☒ N/A
Equipment Used: ☐ Scale ☒ Flashlight ☐ Mirror ☐ Other _____	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		N/A	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: ST Date: 10/27/93

Examiner: Level: Date:

Comments: Inspection after rework

(ISI Use Only)
☑ Pass
☐ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

ANII R Valladares 10/28/93

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230-061
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: Service Water	Component Name: Support/Hanger	Component ID: 324-D
Drawing/Location: CPL-324-R/1 / Rx Bldg. 228' Elev. Penetration 45 - Sleeve 6		
☒ VT-3 Procedure: Spv/230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☒ Variable Support

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware	✓		
Loose/missing parts	✓		
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual:		
Snubber	Actual:	Stroke:	S/N

☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

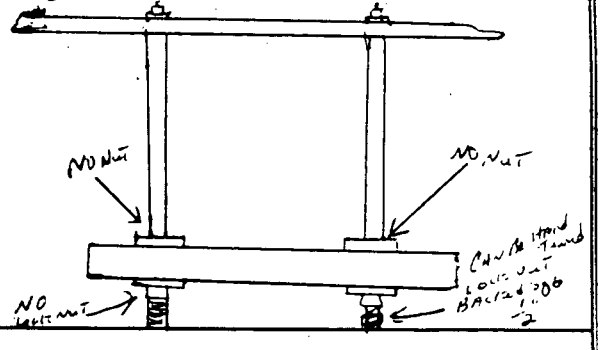
Examiner: [signature] Level: II Date: 10-7-93

Examiner: N/A Level: 10-7-93 II N/A Date: N/A

Comments: NO IDENTIFICATION ON COMPONENT

THIS MOD. IS BEING WORKED

VERY LOOSE SUPPORT



(ISI Use Only)
☐ Pass
☒ Fail

ISI Reviewer: Richard B. Weber Date: 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse UNIT:
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-324-D as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

SIGNED: Scott Lowe 10-11-93
RESPOND BY:

*RELEASING AUTHORITY: Richard B. Weber
DATE: 10/11/93

RESPONSE:
Support is functional. Recommended corrective actions are described on attached SCATEDS

DISTRIBUTION
Dick Weber

SIGNED: L. A. Jones 10/20/93

*RELEASING AUTHORITY: D Dyksterhouse DATE: 10/20/93

*PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-324-D Visual Exam Report No. 1230-061

[ ] Support is acceptable "as is". No corrective action required.

[X] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

(1) VT-3 to verify support was restored in accordance with step 6.10.35.1b and M-1113 and dwg SK-1113-C-1005.
(2) If support has not been tightened issue WR to snug tight the load nuts to put moderate to slight tension in rod. Snug tight existing lock nut (or nuts) against the load nuts. Replace any missing lock nuts under the load nuts with M-563 GRB Hex Nut or equal (Q or Non-Q). Snug tight is defined as unable to be removed with fingers. Snug tight load nuts at top of rods if needed to tension the rods.

Basis:

The CPL-324-D is a Non-Safety Related deadweight hanger which supports 6-CW-24 and 6-CW-40 and is detailed also on M-1113 sketch SK-1113-C-1005 for temp. removal/reinstallations. The rods and load nuts were intact as found and the support fully capable of carrying deadweight. The lack of locknuts above the support IE does not degrade the structural integrity of the support as a deadweight. The support was in partial disarray due in progress mod (1113) replacing the SW pipe at the penetration less than 3 away.

L.A. Jones 10/20/93
NED Engineer Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

Report No. 1230.059
Page 1 of 1

Project | Job No. | PSI ☐ ISI ☒

System: SERVICE WATER	Component Name: SUPPORT/HANGER	Component ID: 324 D-Q
Drawing/Location: CPL-324 D R/O / Aux Bldg. EROM Sleeve on E		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A
Equipment Used: ☒ Scale ☒ Flashlight ☒ Mirror ☐ Other N/A	Type of Component Support: ☐ Hydraulic Snubber ☐ Mechanical Snubber ☒ Support/Hanger ☐ Constant Support ☐ Variable Support	

Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation		✓	
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges		✓	
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	* See Below
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

☒ Accept (When all answers above are "no") ☐ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 10-6-93

Examiner: N/A Level: N/A Date: N/A

Comments:
* U-Bolt were dissassembled could not verify Clearance - This penetration is involved in a modification.

(ISI Use Only)
☑ Pass
☐ Fail
Accepted per Site Memo TSE-93-CR

ISI Reviewer: [signature] Date: 10/28/93

QA NDE ISI 11, Rev. 0, 07/93

AN II [signature] 10/28/93

ROBINSON NUCLEAR PROJECT
SITE MEMORANDUM

TO: Byron Harward/Don Dyksterhouse **UNIT:**
ATTN: Avery Jones
SUBJECT: ISI VT-3 Discrepancy

Please provide resolution for the discrepancies on CPL-324D-Q as documented on attached VT-3 inspection report.

SITE MEMO # TSE-93-CR
SHEET OF
MOD M-
PCN
RET-R G93-GQ

DISTRIBUTION
Dick Weber

RESPOND BY:

SIGNED: Scott Lamm 10-7-93

***RELEASING AUTHORITY:** Richard B. Weber **DATE:** 10/7/93

RESPONSE:
Support is acceptable as is based on M-1113 steps that assure restoration of missing U-Bolt prior to lines being returned to service

DISTRIBUTION
Dick Weber

SIGNED: L. A. Jones 10/7/93

***RELEASING AUTHORITY:** D Dyksterhouse **DATE:** 10/7/93

***PLEASE PRINT NAMES OVER SIGNATURES IF THEY ARE NOT LEGIBLE.**

SUPPORT CORRECTIVE ACTION/EVALUATION DOCUMENTATION SHEET

Support ID CPL-324D-Q Visual Exam Report No. 1230-059

[X] Support is acceptable "as is". No corrective action required.

[ ] Support is functional. The following corrective actions are recommended to be performed prior to return to service.

[ ] Support is functional short term. The following corrective actions must be performed prior to return to service.

[ ] Support is not functional. The following corrective actions must be performed prior to return to service.

Corrective Actions:

None

Basis:

The U-Bolt was removed in accordance with M-1113, section E, step 6.9.23.2b to facilitate piping work at the CV penetrations. Disassembly sheets per MIP-200 were made as required. The U-Bolt will be ~~removed~~ reinstalled prior to lines returning to service in accordance with M-1113, section E, steps 6.10.35.2a & 2b utilizing the SW-4-40/6 design drawing which was incorporated into the mod. In accordance with the signoffs in the mod and on the MIP-200 Disassembly/Reassembly sheets the reinstallation as detailed on the drawing is QC verified. No further evaluation by NED, ISI, or action by VT-3 inspectors is required

10/7/93
NED Engineer Date

Harvey Ferris 10/7/93

DISPOSITION OF FLYWHEEL GOUGE ON "A" RCP

PROBLEM DESCRIPTION:

A refurbished RCP motor (S/N 3S-75P342) was returned to H. B. Robinson during RFO 14 and installed on the "A" RCP. The flywheel was inspected prior to installation and a small gouge was noted.

BACKGROUND:

The flywheel cover was reinstalled and the pie blocks replaced over the "A" pump bay before the NDE report on the flywheel was finished. It would have taken a significant amount of time and effort to reexamine the gouge and make appropriate repairs at this point, so Westinghouse was contacted. The original instructions from Westinghouse were to inspect the gouge for any burrs or raised metal and measure the taper the next time the flywheel cover was removed. If the taper was not 3:1 or greater, the gouge was to be blended out to this ratio.

The gouge was examined again during RFO 15 and was marked "fail" because the taper was only 2:1. Westinghouse was contacted and it was discovered that the ISI reviewer's and the Westinghouse definition of taper were different. The ISI reviewer defined the taper as 1/2 of the length or width (whichever was shorter) divided by the depth (see attached ISI report). Mark Welcer, a Westinghouse design engineer, said that his definition of taper was the full length or width divided by the depth, a 4:1 ratio. He said that the gouge should not pose any problems on the flywheel.

CONCLUSION:

As per my telephone conversation with Mark Welcer and Russ Muth, Westinghouse site service manager for H. B. Robinson, the flywheel for the "A" RCP is considered acceptable to operate.

C. L. Romon — RCP Component Engineer — 11/4/93 — Date

A. J. Canterbury — Manager - Component Engineering — 11/4/93 — Date

Visual Examination
Data Sheet
For H. B. Robinson Unit 2

SL 9-29-93
Report No. 1230 C/O
Page 1 of 1

Project H B R Job No. PSI ☐ ISI ☒ Flywhe

System: Reactor Coolant	Component Name: RCP "A" Flywheel	Component ID: 144A
Drawing/Location: CPL-144 R/O / Rx Bldg		
☒ VT-3 Procedure: SP-1230 Rev. 0	☐ VT-4 Procedure: N/A	Rev. N/A
Direct ☒ Remote ☐	Video Recording No.: N/A	☒ N/A

Equipment Used: ☒ Scale ☒ Flashlight ☐ Mirror ☐ Other N/A

Type of Component Support:
☐ Hydraulic Snubber ☐ Mechanical Snubber ☐ Support/Hanger
☐ Constant Support ☐ Variable Support ☑ FLYWHEEL

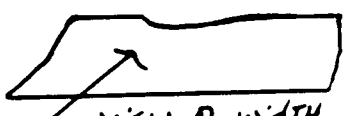
Adverse Condition Present	Yes	No	Comments
Damage, deformation, structural degradation	✓		
Mechanical interference		✓	
Cracks		✓	
Missing attachment/hardware		✓	
Loose/missing parts		✓	
Abnormal wear		✓	
Abnormal corrosion		✓	
Abnormal gouges	✓		
Arc Strikes on sliding support		✓	
Misalignment of the support		✓	
Variable/Constant Support	Actual: N/A		
Snubber	Actual: N/A	Stroke: N/A	S/N N/A

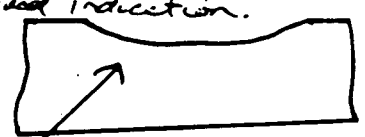
☐ Accept (When all answers above are "no") ☒ Reject (When any answer above is "yes")

Examiner: [signature] Level: II Date: 9-27-93

Examiner: N/A Level: N/A Date: N/A

Comments: Reverification of previously recorded indication.





CRATER (Gouge)
Approx. ½" wide

Approx. 1¼" Long

AREA is Approx. ⅛" deep.
And as of 9-27-93 HAS Red PRIMER painted over it.
FAIRLY SMOOTH SURFACE

Gouge AREA WAS THE ONLY AREA EXAMINED

(ISI Use Only)
☐ Pass
☑ Fail

ISI Reviewer: Richard B Weber Date: 9/29/93

QA NDE ISI 11, Rev. 0, 07/93
AN☐ RPValladares 9/29/93

SIGNATURE LOG

ME	SS #	BADGE #	INITIAL	SIGNATURE
Scott Larson	223-72-4324	NES-1000	SL	Scott Larson
Pete Tingen	245-15-7272	PP1324	PT	Pete Tingen
Clifford Anderson	341-54-7134	NES-1001	CA	Clifford Anderson
Eugene Simpson	416-84-8333	NES-1005	ES	Eugene Simpson
STEVE WOLLUM	473-54-0964	NES-1002	SW	Steve Wollum
KENNETH R. NANCE	303-64-7110	NES-1004	KRN	Kenneth R. Nance
DAVID G. MARTIN	535681227	NES-1006	DGM	David G Martin
BENJAMIN SANDEN	501-68-7826	NES-1003	BRS	Benjamin R. Sanden
Chris D. Judd	536-50-8997		CDJ	Chris D Judd
Michael D. HART	520-70-3087	OS-1316	MDH	Michael D. Hart
WARD MERCER	238-80-8026	OS-1253	WM	Ward Mercer
IAN D. SIMPSON	364-66-4605	PP-1265	IDS	Ian D. Simpson
RAMON P. VALLADARES	176-32-0511	HIC 1002	RPV	Ramon P. Valladares
Timmothy J. Oddson	470-84-8654	NES-1011	TJO	Timmothy J. Oddson

Form No. 80384
QA PQ-6
Revision 2
3/87

CP&L
Carolina Power & Light Company

CERTIFICATE OF NDE PERSONNEL QUALIFICATION

ISI Visual Examiner METHOD-LEVEL II

1. ADMINISTRATIVE/EDUCATIONAL INFORMATION

NAME				SSN
Tingen, Gene G. (Pete)				245-15-7272
COMPANY	DEPARTMENT	UNIT	DATE EMPLOYED	DATE ASSIGNED
CP&L	Tech. Services	MSS/NDE	2/21/81	6/86
HIGH SCHOOL		LOCATION		DATE GRADUATED
Apex Sr. High		Apex, NC		1977
COLLEGE		COURSE	DEGREE	YEAR
Wake Tech, Raleigh, NC		Welding	Diploma	1978

2. ORGANIZED TRAINING/INSTRUCTION

Training Completed 112 (Hours) Under Direction of EPRI
CP&L

☒ Training Requirements Per NDEP-10/20 Satisfied

Remarks:

3. WORK TIME EXPERIENCE

11 Years 8 Months Under Direction of CP&L

Remarks: Includes 6+ years VT related WTE.

4. QUALIFICATION EXAMINATIONS

	EXAM NO.	DATE COMPLETED	RAW SCORE	WEIGHT	WEIGHTED GRADE
GENERAL	ISI-VT-II-G-5, R.1	7-9-92	82.50	.3	24.75
SPECIFIC	ISI-VT-II-S-5, R.2	7-9-92	91.88	.3	27.56
PRACTICAL	*See Below	7-10-92	99.13	.4	39.65
				COMPOSITE GRADE:	91.96

Completed Examinations:
☒ Retained/Maintained by Nuclear Training Section, HEEC, New Hill, NC
☐ Sent To for retention.

Remarks: *ISI-VT-II-P-2, R.0 and ISI-VT-II-P-3, R.0 Added and Averaged

5. CERTIFICATION

This ☐ Initial Certification ☒ Recertification meets the requirements of:
☐ NDEP-10 "Training, Qualification and Certification of Nondestructive Examination Personnel"
☒ NDEP-20 "Training, Qualification and Certification of Visual Examination Personnel for Inservice Inspection"

Level II Qualifications Certified by: , Level III
Principal NDE Specialist
NDE Services
New Hill, NC

Certifications Reviewed/Accepted by:
(When Applicable)

DATE OF CERTIFICATION 7/13/92 DATE CERTIFICATION EXPIRES 7/12/95

Form No. 80384
QA PQ-6
Revision 2
3/87

CP&L
Carolina Power & Light Company

CERTIFICATE OF NDE PERSONNEL QUALIFICATION

Liquid Penetrant METHOD-LEVEL II

1. ADMINISTRATIVE/EDUCATIONAL INFORMATION

NAME				SSN
Tingen, Gene G. (Pete)				245-15-7272
COMPANY	DEPARTMENT	UNIT	DATE EMPLOYED	DATE ASSIGNED
CP&L	Tech. Services	NDE Services	2/21/81	6/86
HIGH SCHOOL		LOCATION		DATE GRADUATED
Apex		Apex, NC		1977
COLLEGE		COURSE	DEGREE	YEAR
Wake Tech., Raleigh, NC		Welding	Diploma	1978

2. ORGANIZED TRAINING/INSTRUCTION

Training Completed 24 (Hours) Under Direction of CP&L

☒ Training Requirements Per NDEP-10/~~20~~ Satisfied

Remarks:

3. WORK TIME EXPERIENCE

8 Years 8½ Months Under Direction of CP&L

Remarks:

4. QUALIFICATION EXAMINATIONS

	EXAM NO.	DATE COMPLETED	RAW SCORE	WEIGHT	WEIGHTED GRADE
GENERAL	PT-II-G-1, R.1	7-29-92	97.50	.3	29.25
SPECIFIC	PT-II-S-1, R.2	7-29-92	90.00	.3	27.00
PRACTICAL	PT-II-P-2, R.0	7-29-92	98.00	.4	39.20
				COMPOSITE GRADE:	95.45

Completed Examinations:
☒ Retained/Maintained by Nuclear Training Section, HBEC, New Hill, NC
☐ Sent To _____ for retention.

Remarks:

5. CERTIFICATION

This ☐ Initial Certification ☒ Recertification meets the requirements of:
☒ NDEP-10 "Training, Qualification and Certification of Nondestructive Examination Personnel"
☐ NDEP-20 "Training, Qualification and Certification of Visual Examination Personnel for Inservice Inspection"

Level II Qualifications Certified by: _____, Level III
Principal NDE Specialist
NDE Services
New Hill, NC

Certifications Reviewed/Accepted by:
(When Applicable)

DATE OF CERTIFICATION 7/29/92 DATE CERTIFICATION EXPIRES 7/28/95

CP&L
Carolina Power & Light Company

QA PQ-6
Revision 2
3/87

CERTIFICATE OF NDE PERSONNEL QUALIFICATION

Ultrasonic METHOD - LEVEL I

1. **ADMINISTRATIVE/EDUCATIONAL INFORMATION**

NAME			SSN	
Tingen, Gene G. (Pete)			245-15-7272	
COMPANY CP&L	DEPARTMENT Technical Services	UNIT NDE Services	DATE EMPLOYED 02/21/81	DATE ASSIGNED 06/86
HIGH SCHOOL Apex High School		LOCATION Apex, NC		DATE GRADUATED 1977
COLLEGE Wake Technical - Raleigh, NC		COURSE Welding	DEGREE Diploma	YEAR 1978

2. **ORGANIZED TRAINING/INSTRUCTION**

Training Completed 91 (Hours) Under Direction of CP&L (11)
EPRI NDE Center (80)

☒ Training Requirements Per NDEP-10/20 Satisfied Carl R. Daman

Remarks:

3. **WORK TIME EXPERIENCE**

- Years 3.75* Months Under Direction of CP&L

Remarks: *675 hours

4. **QUALIFICATION EXAMINATIONS**

	EXAM NO.	DATE COMPLETED	RAW SCORE	WEIGHT	WEIGHTED GRADE
GENERAL	EPRI 201 GD 9/91*	12/11/91	93.0	.3	27.9
SPECIFIC	UT-I-S-3, Rev. 0	12/12/91	100.0	.3	30.0
PRACTICAL	UT-I-P-3, Rev. 0	12/17/91	95.0	.4	38.0
				COMPOSITE GRADE:	95.9

Completed Examinations:
☒ Retained/Maintained by Nuclear Training Section, New Hill, NC
☐ Sent To for retention.
Remarks: *EPRI NDE Center exam utilized in lieu of CP&L exam as permitted by NDEP-10

5. **CERTIFICATION**

This ☒ Initial Certification ☐ Recertification meets the requirements of:
☒ NDEP-10 "Training, Qualification and Certification of Nondestructive Examination Personnel"
☐ NDEP-20 "Training, Qualification and Certification of Visual Examination Personnel for Inservice Inspection"

Level I Qualifications Certified by: Carl R. Daman, Level II
Principal NDE Specialist
NDE Services Unit, New Hill, NC

Certifications Reviewed/Accepted by:
(When Applicable)

DATE OF CERTIFICATION 12/20/91 DATE CERTIFICATION EXPIRES 12/19/94

CP&L VISION TESTING REPORT FOR NON-DESTRUCTIVE AND/OR VISUAL EXAMINERS

FORM NO. 31138
11/88

INITIAL TEST Date 8-11-93 Name Gene Teagen Soc. Sec. No. 245-15-7272 Retest Date _____

NEAR VISION:	INITIAL TEST		INITIAL TEST (Circle One)		RETEST	RETEST (Circle One)	
Rt. Eye	(uncorrected)	14/14			14/____		
Lt. Eye	(uncorrected)	14/14	(PASS)	FAIL	14/____	PASS	FAIL
Rt. Eye	(corrected)	14/N/A			14/____		
Lt. Eye	(corrected)	14/N/A	PASS	FAIL	14/____	PASS	FAIL

The subject passes when 14/14 or better is attained in at least one eye.
ND/VE Coordinator schedules retest when employee fails initial test.
ND/VE Coordinator refers to eye care provided when 14/14 cannot be attained on retest.

DISTANT VISION:	INITIAL TEST		INITIAL TEST (Circle One)		RETEST	RETEST (Circle One)	
BOTH EYES	(Uncorrected)	20/20	(PASS)	FAIL	20/____	PASS	FAIL
	(Corrected)	20/N/A	PASS	FAIL	20/____	PASS	FAIL

The subject passes when 20/30 or better is attained in both eyes together.
ND/VE Coordinator schedules retest when employee fails initial test.
ND/VE Coordinator refers to eye care provider when 20/30 cannot be attained on retest.

COLOR: 8/8 (number identified correctly) (PASS)

INITIAL TEST (Circle One): REQUIRES FURTHER EVALUATION (RFE)

RETEST: Supplemental color perception demonstrates subject's ability to discern colors and contrast between colors applicable for job assignment except _____

The subject "passes" when 8 numerals are identified correctly.
ND/VE Coordinator schedules and performs practical color vision test when 8 numerals are not correctly identified.

Scheduled for Retest (Check One) ☐ Not Applicable ☐ _____ Date _____ Time

This individual has been screened for near and distant visual acuity and color vision in accordance with ANSI/ASME BPV-XI, IWA-2300, 1983.

MY EVALUATION IS:

	INITIAL TEST NEAR ACUITY	INITIAL TEST DISTANT ACUITY	INITIAL TEST COLOR VISION (Circle One)		RETEST NEAR ACUITY	RETEST DISTANT ACUITY	RETEST COLOR VISION (Circle One)	
Uncorrected	14/14	20/20						
Corrected	_____	_____	(PASS)	RFE	_____	_____	PASS	RFE

Paulette Hopkins
TECHNICIAN NAME (Print Clearly)

Paulette Hopkins
TECHNICIAN SIGNATURE

_____
RETEST TECHNICIAN NAME (Print Clearly)

_____
RETEST TECHNICIAN SIGNATURE

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Page ____ of ____

Date 8-20-93

Facility Robinson Nuclear Project RO-15 File No.(s) ____

Level III Review of Contractor NDE Personnel Certifications

Contractor: Nuclear Energy Services (NES) Vendor Procedure: 80A9068, Rev 10 (NDE) 80A9053, Rev. 19 (ISI VT)

Transmitted By NES (Danbury) Date ____ Date Rec. 8/93

Internal Routing: 1. Osman CBO 2. ____ External Routing: 3. ____ 4. ____

☒ No open comments ☐ All previous open comments resolved/closed

☐ Intended corrective action is satisfactory, however, completion of action is needed to close out open comments no.(s) ____ on No. ____

☐ Prior comment no.(s) ____ of No. ____ dated ____ is ☐ pending resolution ☐ resolved/closed

*	#	
		Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence.
		The NDE personnel certifications listed below have been reviewed for compliance to the Vendor's NDE personnel certification procedure (written practice). Personnel marked with an asterisk at the left must have item in question resolved prior to acceptance. Personnel without an asterisk are acceptable and may be used to perform NDE under the CP&L NDE program.
		NAME: MARTIN, DAVID G. SSN: 535-68-1227
		Certification / Cert. Date / Expiration
		☒ PT Level II — 8-16-93 — 8-12-96
		☐ MT Level ____
		☒ UT Level II — 8-16-93 — 8-12-96
		☐ RT Level ____
		☐ ET Level ____
		☐ VT (VWI) Level ____
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4
		☐ Visual Acuity — 8-12-93 — 8-12-94
		NAME: Larson, Scott SSN: 223-72-4324
		Certification / Cert. Date / Expiration
		☐ PT Level ____
		☐ MT Level ____
		☐ UT Level ____
		☐ RT Level ____
		☐ ET Level ____
		~~☒ VT (VWI) Level III~~ CBO 8/20/93
		☒ ISI VT ☒ 1 ☒ 2 ☒ 3 ☒ 4 Level III — 8-16-93 — 7-1-97
		☐ Visual Acuity

Technician/Engineer/Specialist/Supervisor

Carl R. Osman Level III 8/20/93

Principal NDE Specialist/Unit Manager

Review No. _____

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW
CONTINUATION SHEET

Date 8-2-93

RNP, NES, RC-15

*	#	Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence.			
*	6	NAME: Wollum, Steven P.		SSN: 473-54-C964	
		Certification	Cert. Date	Expiration	
		☒ PT Level II	3-2-93	2-20-95	ok
		☒ MT Level II	3-2-93	2-19-95	ok
		☒ UT Level I	2-3-93	2-19-95	ok
		☐ ~~PT Level~~ UT Level II (Thickness)	2-3-93	9-3-95	ok
		☐ ET Level _____			
		☐ VT (VWI) Level _____			
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4			
		☒ Visual Acuity	3-8-93	3-8-94	ok
		NAME:		SSN:	
		Certification	Cert. Date	Expiration	
		☐ PT Level _____			
		☐ MT Level _____			
		☐ UT Level _____			
		☐ RT Level _____			
		☐ ET Level _____			
		☐ VT (VWI) Level _____			
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4			
		☐ Visual Acuity			
		NAME:		SSN:	
		Certification	Cert. Date	Expiration	
		☐ PT Level _____			
		☐ MT Level _____			
		☐ UT Level _____			
		☐ RT Level _____			
		☐ ET Level _____			
		☐ VT (VWI) Level _____			
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4			
		☐ Visual Acuity			

	Carl R. Daman Level III 5/2/93
Technician/Engineer/Specialist/Supervisor	Principal NDE Specialist/Unit Manager

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Date 8-2-93

Facility Robinson Nuclear Project RC-15 File No.(s)

el III Review of Contractor NDE Personnel Certifications

Contractor: Nuclear Energy Services (NES) Vendor Procedure: BCA9065, Rev 10 (NDE) BOA9053, Rev 14 (ISI VT)

Transmitted By Date Date Rec. 8-2-93

Internal Routing 1. Osmen CRD 2.

External Routing 3. 4.

☐ No open comments ☐ All previous open comments resolved/closed

☐ Intended corrective action is satisfactory, however, completion of action is needed to close out open comments no.(s) on No.

☐ Prior comment no.(s) of No. dated is ☐ pending resolution ☐ resolved/closed.

*	#	
		Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence.
		The NDE personnel certifications listed below have been reviewed for compliance to the Vendor's NDE personnel certification procedure (written practice). Personnel marked with an asterisk at the left must have item in question resolved prior to acceptance. Personnel without an asterisk are acceptable and may be used to perform NDE under the CP&L NDE program.
	1	NAME: LARSON, SCOTT SSN: 223-72-4324
		Certification / Cert. Date / Expiration
		☒ PT Level III / 5-11-93 / 11-1-97
		☒ MT Level III / 5-11-93 / 11-1-97
		☒ UT Level III / 5-11-93 / 7-1-97
		☒ ~~ET~~ Mech. Level II / 12-17-90 / 12-14-93
		☒ ~~ET~~ Piping/Welding Level II / 12-17-90 / 12-14-93
		☐ VT (VWI) Level
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4
		☒ Visual Acuity / 3-4-93 / 3-4-94
	2	NAME: ANDERSON, CLIFF SSN: 341-54-7134
		Certification / Cert. Date / Expiration
		☒ PT Level III / 7-29-91 / 5-22-96
		☒ MT Level III / 7-29-91 / 5-22-96
		☒ UT Level III / 6-19-92 / 5-22-96
		☒ ~~RT~~ EGSCC Level Sizing (manual) / 10-5-92 / 2-2-95
		☒ ~~ET~~ Mech Level II / 2-15-93 / 2-12-96
		☒ ~~VT~~ Piping/Welding Level II / 2-15-93 / 2-11-96
		☒ ISI VT ☒ 1 ☒ 2 ☒ 3 ☒ 4 / 2-12-93 / 2-11-96
		☒ Visual Acuity / 2-24-93 / 2-24-94

	Carl R Carson
Technician/Engineer/Specialist/Supervisor	Principal NDE Specialist/Unit Manager

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Page 1 of 1
Date 9/3/93

Facility RNP File No.(s) –

Level III Review of Contractor NDE Personnel Certifications

Contractor: NES/SIEMANS Vendor Procedure: SPC-GMP-C2 [illegible]

Transmitted By: SCOTT LANSON Date 9/1/93 Date Rec. 9/[illegible]/93

Internal Routing

1. BETZ 2. _____ 3. _____ 4. _____

☐ No Open ☐ All previous open comments resolved/closed

☐ Intended corrective action is satisfactory, however, completion of action is needed to close out open comments no.(s)_____ on No._____

☐ Prior comment no.(s) _____ of No. _____ dated _____ is ☐ pending resolution ☐ resolved/closed.

●	#	Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence. The NDE personnel certifications listed below have been rewiewed for compliance to the Vendor's NDE personnel certification procedure (written practice). Personnel marked with an asterisk at the left must have item in question resolved prior to acceptance. Personnel without an asterisk are acceptable and may be used to perform NDE under the CP&L NDE program.

NAME: YOUSUF A. KHAN SSN: 099-64-9683

Certification	Cert. Date	Expiration	Comments
☐ PT Level —	—	—	
☐ MT Level —	—	—	
☒ UT Level III	4/3/92	8-4-94	PSCIN LEVEL III [illegible]
☐ RT Level III	2/5/91	6-12-94	
☐ ET Level —	—	—	
☐ VT (VWI) Level —	—	—	
☐ ISI VT ☐1 ☐2 ☐3 ☐4	—	—	
☒ Visual Acuity	8-16-93	8-9-94	ONSITE

NAME: PHILIP G SHANNON SSN 408-90-9334

Certification	Cert. Date	Expiration	Comments
☐ PT Level —	—		
☐ MT Level —	—		
☒ UT Level II	9-4-91	8-25-94	PSCAN LEVEL II 9-10-93 - 9-9-96
☐ RT Level —	—		
☐ ET Level —	—		
☐ VT (VWI) Level —	—		
☐ ISI VT ☐1 ☐2 ☐3 ☐4	—		
☒ Visual Acuity	10-12-92	10-11-93	ITEAL

Technician/Engineer/Specialist/Supervisor

[signature] LEVEL III

Principal NDE Specialist/Unit Manager

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Date 9-15-93

NAME: JAMES E. SMEDLEY SSN: 416-86-6112

Certification	Cert. Date	Expiration	Comments
☐ PT Level —	—	—	
☐ MT Level —	—	—	
☒ UT Level II	12-17-91	12-3-94	DSCNG LEVEL II
☐ RT Level —	—	—	
☐ ET Level —	—	—	
☐ VT (VWI) Level —	—	—	
☐ ISI VT ☐1 ☐2 ☐3 ☐4	—	—	
☒ Visual Acuity	11-11-92	11-10-93	CURRENT

NAME: SSN:

Certification	Cert. Date	Expiration	Comments
☐ PT Level			
☐ MT Level			
☐ UT Level	A		
☐ RT Level N			
☐ ET Level			
☐ VT (VWI) Level			
☐ ISI VT ☐1 ☐2 ☐3 ☐4			
☐ Visual Acuity			

NAME: SSN:

Certification	Cert. Date	Expiration	Comments
☐ PT Level			
☐ MT Level			
☐ UT Level	A		
☐ RT Level A			
☐ ET Level			
☐ VT (VWI) Level			
☐ ISI VT ☐1 ☐2 ☐3 ☐4			
☐ Visual Acuity			

Technician/Engineer/Specialist/Supervisor

Principal NDE Specialist/~~Unit Manager~~ LEVEL III

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Page 1 of 1

Date 9/-/93

Facility ROBINSON NUCLEAR PLANT (ISI/NDE) File No.(s)

Level III Review of Contractor NDE Personnel Certifications

Contractor: NES Vendor Procedure: 8017 GC6S REV 9

Transmitted By M.E. ALLING Date 9/8/93 Date Rec. 9/9/93 (FAX)

Internal Routing
1. NCTR 2. 3. 4.

External Routing

☒ No open comments ☐ All previous open comments resolved/closed

☐ Intended corrective action is satisfactory, however, completion of action is needed to close out open comments no.(s) on No.

☐ Prior comment no.(s) of No. dated is ☐ pending resolution ☐ resolved/closed

•	#	Comments - asterisk (•) denotes a comment which must be resolved with Level III/Unit Manager concurrence.
		The NDE personnel certifications listed below have been reviewed for compliance to the Vendor's NDE personnel certification procedure (written practice). Personnel marked with an asterisk at the left must have item in question resolved prior to acceptance. Personnel without an asterisk are acceptable and may be used to perform NDE under the CP&L NDE program.
		NAME: BAUMAN SANDEN SSN:
		Certification / Cert. Date / Expiration
		☐ PT Level N/A — —
		☐ MT Level — — —
		☐ UT Level II 9-2-93 9-1-96
		☐ RT Level — — —
		☐ ET Level — — —
		☐ VT (VWI) Level — — —
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4 — —
		☐ Visual Acuity 9/2/93 9/1/94
	X	MINIMAL ISI EXPERIENCE SPOKE SCOTT. HE INDICATED GOOD CONF. DO
		NAME: SSN:
		Certification / Cert. Date / Expiration
		☐ PT Level
		☐ MT Level
		☐ UT Level
		☐ RT Level
		☐ ET Level
		☐ VT (VWI) Level
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4
		☐ Visual Acuity

Technician/Engineer/Specialist/Supervisor

LEVEL III

Principal NDE Specialist/~~Unit Manager~~

Review No. _____

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW
CONTINUATION SHEET

Date 8-2-93

RNP, NES RO-15

	#	Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence.			
	3	NAME: Gruno, Valentine		SSN:	
		Certification	Cert. Date	Expiration	
		☒ PT Level II	3-17-92	3-15-95	ok
		☒ MT Level II	3-17-92	3-15-95	ok
		☒ UT Level II	3-17-92	3-15-95	ok
		☐ RT Level _____			
		☐ ET Level _____			
		☐ VT (VWI) Level _____			
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4			
*		☒ Visual Acuity	3-17-92	3-17-93	Unsat.
	4	NAME: Bagwell, Mark F.		SSN: 553-81-1802	
		Certification	Cert. Date	Expiration	
		☒ PT Level II (Color Contrast Only)	9-2-92	8-25-95	ok
		☒ MT Level II (Visible Only)	9-2-92	8-25-95	ok
		☒ UT Level II			
		☐ RT Level _____			
		☐ ET Level _____			
		☐ VT (VWI) Level _____			
		☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4			
		☒ Visual Acuity	11-19-92	11-19-93	ok
	5	NAME: Nance, Kenneth R.		SSN: 303-64-7110	
		Certification	Cert. Date	Expiration	
		☒ PT Level II (Color Contrast Only)	9-1-92	8-11-95	
		☒ MT Level II (Visible Only)	9-1-92	8-12-95	
		☐ UT Level _____			
		☐ RT Level _____			
		☐ ET Level _____			
		☐ VT (VWI) Level _____			
		☒ ISI VT ☒ 1 (☐ 2) ☒ 3 ☒ 4 (No VT-2)	9-29-92	93-9-95	
*		☒ Visual Acuity	8-12-92	8-12-92	Unsat. ok

	Carl R Clamm Level III 8/24
Technician/Engineer/Specialist/Supervisor	Principal NDE Specialist/Unit Manager

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Page 1 of 1

Date 9-1-93

Facility H B Robinson Unit 2 RO-15 File No.(s) _____

Level III Review of Contractor NDE Personnel Certifications

Contractor: Nuclear Energy Services (NES) Vendor Procedure: 80A 9068 (NDE) 80A 9069 (ISI VT)

Transmitted By Ed Doubleday Date _____ Date Rec. _____

Internal Routing
1. Osman CRO 2. _____

External Routing
3. _____ 4. _____

☒ No open comments ☐ All previous open comments resolved/closed

☐ Intended corrective action is satisfactory, however, completion of action is needed to close out open comments no.(s) _____ on No. _____

☐ Prior comment no.(s) _____ of No. _____ dated _____ is ☐ pending resolution ☐ resolved/closed.

*	#	Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence.
		The NDE personnel certifications listed below have been reviewed for compliance to the Vendor's NDE personnel certification procedure (written practice). Personnel marked with an asterisk at the left must have item in question resolved prior to acceptance. Personnel without an asterisk are acceptable and may be used to perform NDE under the CP&L NDE program.

NAME: SIMPSON, EUGENE SSN: 416-84-8333

Certification	Cert. Date	Expiration
☒ PT Level II	9-1-92	8-11-95
☒ MT Level II	9-1-92	8-11-95
☒ UT Level I	8-26-93	8-23-96
☒ ~~RT~~ Level II UT Thickness	9-1-92	8-12-95
☐ ET Level _____		
☒ VT (VWI) Level II	8-26-93	1-6-95
☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4		
☒ Visual Acuity	8-24-93	8-24-94

NAME: SSN:

Certification	Cert. Date	Expiration
☐ PT Level _____		
☐ MT Level _____		
☐ UT Level _____		
☐ RT Level _____		
☐ ET Level _____		
☐ VT (VWI) Level _____		
☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4		
☐ Visual Acuity		

NAME: SSN:

Certification	Cert. Date	Expiration
☐ PT Level _____		
☐ MT Level _____		
☐ UT Level _____		
☐ RT Level _____		
☐ ET Level _____		
☐ VT (VWI) Level _____		
☐ ISI VT ☐ 1 ☐ 2 ☐ 3 ☐ 4		
☐ Visual Acuity		

Carl R Osman, Level III 9/1/93

Technician/Engineer/Specialist/Supervisor

Principal NDE Specialist/~~Unit Manager~~

Review No. _____

CAROLINA POWER & LIGHT COMPANY
NDE SERVICES UNIT
TECHNICAL REVIEW

Page 1 of _____

Date 9/14/93

Facility ROBINSON NUCLEAR PLANT File No.(s) _____

Document Title NDE PERSONNEL CERTIFICATIONS

Review Type: LEVEL III

Document No. LISTED BELOW Rev. _____ Date _____

Transmitted By SCOTT WILSON Date 9/14/93 Date Rec. 9/14/93

Internal Routing				External Routing			
1.	~~BOT~~	3.		1.		3.	
2.		4.		2.		4.	

☐ No open comments ☐ All previous open comments resolved/closed

☐ Intended corrective action is satisfactory, however, completion of action is needed to close out open comments no.(s) _____ on No. _____

☐ Prior comment no.(s) _____ of No. _____ dated _____ is ☐ pending resolution ☐ resolved/closed.

*	#	Comments - asterisk (*) denotes a comment which must be resolved with Level III/Unit Manager concurrence.
		THE NDE PERSONNEL CERTIFICATIONS LISTED BELOW HAVE BEEN REVIEWED FOR COMPLIANCE TO THE VENDOR'S NDE PERSONNEL CERTIFICATION PROCEDURE (WRITTEN PRACTICE). PERSONNEL MARKED WITH AN ASTERISK AT THE LEFT MUST HAVE ITEM IN QUESTION RESOLVED PRIOR TO ACCEPTANCE. PERSONNEL WITHOUT AN ASTERISK ARE ACCEPTABLE AND MAY BE USED TO PERFORM NDE UNDER THE BASIC NDE PROGRAM
		NAME: ROXANNA SANDEN SS#
		CERTIFICATION: / CERT DATE / EXPIRATION
		PT LEVEL I / 9-10-93 / 9-9-95
		NAME: CHRIS SUND SS# 536-50-8997
		VISUAL ACUITY / 9/8/93 / 9/9/93
		PT LEVEL II / 9/10/93 / 9/9/96
		UT LEVEL II / 9/10/93 / 9/9/96 NO SIGNIFICANT VISION DEFICIENCIES

Technician/Engineer/Specialist/Supervisor

LEVEL III

Principal NDE Specialist/Unit Manager

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

VISION ACUITY EXAMINATION REPORT

Name: Tim Oddson SSN: 470-84-8654 Date: 9-27-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	~~J~~	J 1
Left Eye	~~J~~	J 1
	Pass (Fail)	(Pass) Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	~~20~~	20/ 20
Left Eye	~~20~~	20/ 20
	Pass (Fail)	(Pass) Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Scott Larson — Examined by

LTC — Title

9-27-93 — Date

==========

* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

File: Timmothy Oddson

CERTIFICATE OF QUALIFICATION

MAGNETIC PARTICLE EXAMINATION

LEVEL II

Timmothy Oddson is qualified as Level II in Magnetic Particle Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS	Visible	SEE ATTACHED VISION ACUITY REPORT		
EDUCATION	High School Graduate Windom Area High School Windom, Minnesota	Date Completed: 05-30-78		
COLLEGE OR TECHNICAL	Nondestructive Test 2 yrs Hutchinson Vocational Inst. Hutchinson, Minnesota	Date Completed: 04-26-88		

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	04-26-88	115.00
			Total:	115.00

NES EXPERIENCE

MAGNETIC PARTICLE EXAMINATION ASSIGNMENTS (List up to 12 MT assignments.)	EXPERIENCE AT EACH LEVEL OF MT CERTIFICATION From	To	Level	Type	Months
ISI: Shearon Harris	10-10-89	12-07-89	I	Nuclear	1.95
ISI: Shearon Harris			II	Nuclear	
				Total:	1.95

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	MT EXPERIENCE Level	Type	Months
* Ebasco Services, Inc.	South Kearny, New Jersey	09-25-88	03-04-89	Trainee	Nuclear/Non	1.94
Memphis Testing Services	Memphis, Tennessee	04-03-89	06-17-89	II	Nuclear	0.66
Southern Company Services	Birmingham, Alabama	09-07-89	09-27-89	I	Nuclear	0.58
					Total:	3.18

* Denotes non-continuous experience.

TOTAL EXPERIENCE 5.13 months of experience in magnetic particle examination

CERTIFICATION EXAMINATIONS

General Examination	86.67	(.3)	Exams administered: 09-02-92
Specific Examination	80.00	(.2)	
Practical Examination	95.00	(.5)	Exams completed: 09-03-92
Composite Score	89.50		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 04-03-89
Initial Level II certification issued by NES: 09-04-92

CERTIFIED BY

K J Mancuso 9/4/92

~~LEVEL III EXAMINER~~

DATE OF CERTIFICATION 09-04-92
DATE OF EXPIRATION 09-02-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

File: Timmothy Oddson

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL II

Timmothy Oddson is qualified as Level II in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS	Color Contrast	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Windom Area High School Windom, Minnesota	Date Completed: 05-30-78	COLLEGE OR TECHNICAL	Nondestructive Test 2 yrs Hutchinson Vocational Inst. Hutchinson, Minnesota	Date Completed: 04-26-88

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	04-26-88	105.00
			Total:	105.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)		EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
ISI: Shearon Harris	North Carolina	10-10-89	11-29-89	I	Nuclear	1.70
ISI: Shearon Harris		11-29-89	12-07-89	II	Nuclear	0.25
ISI: Shearon Harris				II	Nuclear	
					Total:	1.95

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
Met-Chem Testing Labs	S. Salt Lake City, Utah	04-21-87	05-29-87	Trainee	Non-nuclear	0.15
* Ebasco Services, Inc.	South Kearny, New Jersey	09-25-88	03-04-89	Trainee	Nuclear/Non	0.97
Memphis Testing Services	Memphis, Tennessee	04-03-89	06-17-89	II	Nuclear	1.30
Southern Company Services	Birmingham, Alabama	09-07-89	09-27-89	I	Nuclear	0.34
					Total:	2.76

* Denotes non-continuous experience.

TOTAL EXPERIENCE 4.71 months of experience in penetrant examination

CERTIFICATION EXAMINATIONS

General Examination	90.00	(.3)	Exams administered: 09-02-92
Specific Examination	85.00	(.2)	
Practical Examination	99.00	(.5)	Exams completed: 09-03-92
Composite Score	93.50		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 04-30-89
Initial Level II certification issued by NES: 09-04-92

CERTIFIED BY

N J Mason 9/4/92

~~LEVEL III EXAMINER~~

DATE OF CERTIFICATION 09-04-92
DATE OF EXPIRATION 09-02-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

File: Timmothy Oddson

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL II

Timmothy Oddson is qualified as Level II in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: None

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Windom Area High School Windom, Minnesota	Date Completed: 05-30-78
COLLEGE OR TECHNICAL	Nondestructive Test 2 yrs Hutchinson Vocational Inst. Hutchinson, Minnesota	Date Completed: 04-26-88

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	04-26-88	405.00

Total: 405.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: Shearon Harris	10-10-89	12-07-89	I	Nuclear	1.95
ISI: Shearon Harris			II	Nuclear	

Total: 1.95

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
Met-Chem Testing Labs	S. Salt Lake City, Utah	04-21-87	05-29-87	Trainee	Non-nuclear	1.27
Reinhart and Associates	Austin, Texas	04-21-88	05-15-88	Trainee	Non-nuclear	0.75
* Ebasco Services, Inc.	South Kearny, New Jersey	09-25-88	11-19-88	Trainee	Nuclear/Non	2.06
Ebasco Services, Inc.	South Kearny, New Jersey	02-06-89	03-04-89	I	Nuclear	1.25
Memphis Testing Services	Memphis, Tennessee	04-03-89	06-17-89	I	Nuclear	2.61
Southern Company Services	Birmingham, Alabama	09-07-89	09-27-89	I	Nuclear	0.31

* Denotes non-continuous experience.
See PREVIOUS EXPERIENCE RECORD for additional previous UT experience entries.

Total: 24.24

TOTAL EXPERIENCE

26.19 months of experience in ultrasonic examination

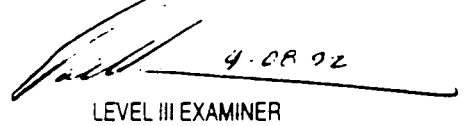
CERTIFICATION EXAMINATIONS

General Examination	75.00	(.3)	Exams administered:
Specific Examination	90.00	(.2)	09-02-92
Practical Examination	91.00	(.5)	Exams completed:
Composite Score	86.00		09-03-92

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-08-92

CERTIFIED BY



LEVEL III EXAMINER

DATE OF CERTIFICATION 09-08-92
DATE OF EXPIRATION 09-02-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES, INC.

PERSONNEL PERFORMANCE QUALIFICATION SHEET

Procedure No.	Revision	Addenda No./ Field Change No.
SP 1225 (NES 83A6083 R.3)	0	N/A

Title: UT Exam of Bolting

Personnel	Certification Level
Tim Oddson	II Date: 10/8/93
	Date: / /

Component ID: CPL 62

Test Results: Pass ☒ Fail ☐

Limitations/Restrictions: No ☒ Yes ☐ *(See Below)*

Witness: Scott Lem UT Level: III Date: 10/8/93

Authorized Inspection Agency: (Optional) _____ Date: / /

nes — NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Timmothy Oddson

High School Graduate Windom Area High School Windom, Minnesota	Date Completed: 05-30-78	Nondestructive Test 2 yrs Hutchinson Vocational Inst. Hutchinson, Minnesota	Date Completed: 04-26-88	DATE OF EYE EXAM: 09-27-93 CORRECTIVE LENSES REQUIRED: Near: Yes Far: Yes EYE EXAM DUE: 09-27-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	115.00	Ultrasonics:	405.00	IGSCC Sizing:	0.00
Penetrant:	105.00	Visual:	60.00	Weld Overlay:	0.00
Radiography:	413.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	3.55	19.17	22.72	Visible
Penetrant:	3.55	18.75	22.30	Color Contrast
Radiography:	0.00	0.00	0.00	
Ultrasonics:	3.55	24.24	27.79	None
Visual:	0.00	5.93	5.93	

DATE OF CURRENT CERTIFICATION

	Trainee	I	II	III
Magnetic Particle		10-10-89	09-04-92	
Penetrant		10-10-89	09-04-92	
Radiography				
Ultrasonics		10-10-89	09-08-92	
Visual				

DATE OF EXPIRATION

	Trainee	I	II	III
Magnetic Particle			09-02-95	
Penetrant			09-02-95	
Radiography				
Ultrasonics			09-02-95	
Visual				

IGSCC Detection (Manual) _____

IGSCC Sizing (Manual) _____

Weld Overlay (Manual) _____

Nozzle Inner Radius Qualification _____

PREVIOUS EMPLOYMENT INITIAL CERTIFICATION

	Trainee	I	II	III
Magnetic Particle	09-23-88		04-03-89	
Penetrant	04-21-87		04-30-89	
Radiography				
Ultrasonics	04-21-87	02-06-89		
Visual	04-21-87	09-23-88		

DATE OF INITIAL NES CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			10-10-89	09-04-92
Penetrant			10-10-89	09-04-92
Radiography				
Ultrasonics			10-10-89	09-08-92
Visual				

IGSCC Detection _____

IGSCC Sizing _____

Weld Overlay _____

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

10-12-93
Date

NAME: Timmothy Oddson

EDUCATION AND TRAINING RECORD

Nondestructive Examination

EDUCATION

High School Graduate Windom Area High School Windom, Minnesota	Date Completed: 05-30-78	Nondestructive Test 2 yrs Hutchinson Vocational Inst. Hutchinson, Minnesota	Date Completed: 04-26-88	Education credited toward NDE certifications: 14 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	N/A	04-26-88	115.00
					Total this page:	115.00
					TOTAL:	115.00
PT	Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	N/A	04-26-88	105.00
					Total this page:	105.00
					TOTAL:	105.00
RT	Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	N/A	04-26-88	413.00
					Total this page:	413.00
					TOTAL:	413.00
UT	Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	N/A	04-26-88	405.00
					Total this page:	405.00
					TOTAL:	405.00

IGSCC Detection Hrs: 0.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

VT	Hutchinson Voc/Tech Inst.	Hutchinson, Minnesota	Level I and II	N/A	04-26-88	60.00
					Total this page:	60.00
					TOTAL:	60.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-8-92
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: Timmothy Oddson

	NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT	ISI: Shearon Harris	10-10-89	12-07-89	I	Nuclear	1.95
	ISI: Shearon Harris	09-04-92	11-20-92	II	Nuclear	1.60
	ISI: H.B. Robinson			II	Nuclear	
					Total this page:	3.55
					TOTAL:	3.55
PT	ISI: Shearon Harris	10-10-89	11-29-89	I	Nuclear	1.70
	ISI: Shearon Harris	11-29-89	12-07-89	II	Nuclear	0.25
	ISI: Shearon Harris	09-04-92	11-20-92	II	Nuclear	1.60
	ISI: H.B. Robinson			II	Nuclear	
					Total this page:	3.55
					TOTAL:	3.55
RT						
					TOTAL:	0.00
UT	ISI: Shearon Harris	10-10-89	12-07-89	I	Nuclear	1.95
	ISI: Shearon Harris	09-04-92	11-20-92	II	Nuclear	1.60
	ISI: H.B. Robinson			II	Nuclear	
					Total this page:	3.55
					TOTAL:	3.55
VT						
					TOTAL:	0.00

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary Ellen Alling
Technical Director's Designee

9-23-93
Date

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Timmothy Oddson

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT	* Ebasco Services, Inc.	South Kearny, New Jersey	Nuclear/Non	09-25-88	03-04-89	1.94	Trainee
	Memphis Testing Services	Memphis, Tennessee	Nuclear	04-03-89	06-17-89	0.66	II
	Southern Company Services	Birmingham, Alabama	Nuclear	09-07-89	09-27-89	0.58	I
	* Ebasco Services, Inc.	New York, New York	Nuclear/Non	01-08-90	06-07-90	3.71	I
	* Virginia Corporation	Richmond, Virginia	Nuclear	09-22-90	05-01-92	10.47	II
	* Lambert,MacGill& Thomas	Santa Clara, California	Nuclear	09-02-91	10-28-91	1.81	II
					Total this page:	19.17	
					TOTAL:	19.17	
PT	Met-Chem Testing Labs	S. Salt Lake City, Utah	Non-nuclear	04-21-87	05-29-87	0.15	Trainee
	* Ebasco Services, Inc.	South Kearny, New Jersey	Nuclear/Non	09-25-88	03-04-89	0.97	Trainee
	Memphis Testing Services	Memphis, Tennessee	Nuclear	04-03-89	06-17-89	1.30	II
	Southern Company Services	Birmingham, Alabama	Nuclear	09-07-89	09-27-89	0.34	I
	* Ebasco Services, Inc.	New York, New York	Nuclear/Non	01-08-90	06-07-90	3.71	II
	* Virginia Corporation	Richmond, Virginia	Nuclear	09-22-90	05-01-92	10.47	II
					Total this page:	16.94	
	See next page for additional PT entries.				TOTAL:	18.75	
RT							
					TOTAL:	0.00	
UT	Met-Chem Testing Labs	S. Salt Lake City, Utah	Non-nuclear	04-21-87	05-29-87	1.27	Trainee
	Reinhart and Associates	Austin, Texas	Non-nuclear	04-21-88	05-15-88	0.75	Trainee
	* Ebasco Services, Inc.	South Kearny, New Jersey	Nuclear/Non	09-25-88	11-19-88	2.06	Trainee
	Ebasco Services, Inc.	South Kearny, New Jersey	Nuclear	02-06-89	03-04-89	1.25	I
	Memphis Testing Services	Memphis, Tennessee	Nuclear	04-03-89	06-17-89	2.61	I
	Southern Company Services	Birmingham, Alabama	Nuclear	09-07-89	09-27-89	0.31	I
					Total this page:	8.25	
	See next page for additional UT entries.				TOTAL:	24.24	
VT	Met-Chem Testing Labs	S. Salt Lake City, Utah	Non-nuclear	04-21-87	05-29-87	1.34	Trainee
	* Ebasco Services, Inc.	South Kearny, New Jersey	Nuclear/Non	09-25-88	03-04-89	1.14	I
	Memphis Testing Services	Memphis, Tennessee	Nuclear	04-03-89	06-17-89	2.50	II VT-1
	Southern Company Services	Birmingham, Alabama	Nuclear	09-07-89	09-27-89	0.95	Trainee
					Total this page:	5.93	
					TOTAL:	5.93	

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-8-92
Date

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Timmothy J Oddson

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT							
PT	* Lambert,MacGill,Thomas	Santa Clara, California	Nuclear	09-02-91	10-28-91	1.81	II
					Total this page:	1.81	
RT							
UT	* Ebasco Services, Inc.	New York, New York	Nuclear/Non	01-08-90	06-07-90	3.71	I
	* Virginia Corporation	Richmond, Virginia	Nuclear	09-22-90	05-20-92	10.47	II
	* Lambert,MacGill,Thomas	Santa Clara, California	Nuclear	09-02-91	10-28-91	1.81	II
					Total this page:	15.99	
VT							

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-8-92
Date

Resume for
Timmothy J. Oddson

EXPERIENCE SUMMARY

Performed Nondestructive examinations on piping systems and supports at Nuclear Power Plants, Fossil Fuel Power Plants and Petro Chemical Plants.

EXPERIENCE

NES, Inc., Danbury, Connecticut

09/93 to Present	H.B. Robinson - Certified Level II MT, PT and UT.
09/92 to 11/20/92	Shearon Harris - Performed MT, PT and UT Level II examinations.
10/09/89 to 10/21/89	Cape Industries - Performed MT, PT and UT examinations on piping systems and supports.
10/22/89 to 12/07/89	Shearon Harris - Performed MT, PT and UT examinations on piping systems and supports.

VIRGINIA CORPORATION OF RICHMOND, Richmond, Virginia

01/20/92 to 05/01/92 03/24/91 to 06/10/91 01/06/91 to 02/25/91 09/22/90 to 12/20/90	Surry - Performed MT, PT and UT examinations on snubbers and supports.

LAMBERT, McGILL & THOMAS, Santa Clara, California

10/15/91 to 10/28/91	E.I.Hatch - Performed UT, MT and PT examinations of piping systems and supports.
09/02/91 to 10/14/91	Vogtle Unit 1 - Performed UT, MT and PT examinations of piping systems and supports.

EBASCO SERVICES, Inc., New York, New York

05/07/90 to 06/07/90	Exxon Refinery, Baytown, Texas - Performed UT, MT and PT examinations on piping systems and supports.
04/01/90 to 04/28/90	Braidwood - Performed UT, MT and PT examinations on piping systems and supports.
02/26/90 to 03/17/90	Clinton - Performed UT, MT and PT examinations on piping systems and supports.
01/08/90 to 02/13/90	Byron - Performed UT, MT and PT examinations on piping systems and supports.
09/88 to 11/88 02/89 to 03/89	Millstone, E.I. Hatch, Port Everglades - Trainee in UT, MT, PT, VT inservice inspection examinations of piping, piping supports and vessels.

SOUTHERN COMPANY SERVICES, Birmingham, Alabama

09/89	Performed Level I MT, PT and UT examinations of piping and components.

EXPERIENCE (Continued)

MEMPHIS TESTING SERVICES, Memphis, Tennessee

04/89 to 06/89	Trojan - Performed Level I UT, Level II MT, PT and VT-1 inservice inspection examinations of piping, vessels, piping supports and flywheels.

REINHART & ASSOCIATES, Inc., Austin, Texas

04/88 to 05/88	Sutherland, Nebraska Fossil Plant - Performed UT Thickness examinations of boiler tubing.

MET-CHEM LABORATORIES OF UTAH, Inc., Salt Lake City, Utah

04/87 to 05/87	Chevron Plant, Rock Springs, Wyoming - Performed UT Thickness examinations of piping at petrochemical plant.

EDUCATION

1978 Windom Area High School, Windom, Minnesota, Graduate

1988 Hutchinson Area Vocational Technical Institute - Nondestructive Testing in the following disciplines:

413 hours	Radiography
405 hours	Ultrasonics
235 hours	Eddy Current
115 hours	Magnetic Particle
105 hours	Liquid Penetrant
60 hours	Visual Testing

Other NDE courses included Technical Math, Physics, Infrared Testing, Metallurgy, Leak Testing, Management and Industrial Relations, Quality Control, Accoustic Emissions, Codes and Specifications, Blue Print, Computers and Welding.

CERTIFICATIONS

Magnetic Particle	Level II
Liquid Penetrant	Level II
Ultrasonics	Level II

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

VISION ACUITY EXAMINATION REPORT

Name: CLIFFORD ANDERSON SSN: 341-54-7134 Date: 2-24-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J N/A	J-1
Left Eye	J N/A	J-1
	~~Pass/Fail~~	(Pass)/Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/ N/A	20/ 20
Left Eye	20/ N/A	20/ 20
	~~Pass/Fail~~	(Pass)/Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Examined by	Title	Date
[signature]	UT PT & III	2-24-93

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* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

~~MT~~			ET		
PT			LT		
RT	N/A		VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

File: Cliff Anderson

CERTIFICATE OF QUALIFICATION

MAGNETIC PARTICLE EXAMINATION

LEVEL III

Cliff Anderson is qualified as Level III in Magnetic Particle Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate William J. Bogan H. S. Chicago, Illinois	Date Completed: 06-01-79	COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-83

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	05-31-83	20.00

Total: 20.00

NES EXPERIENCE

MAGNETIC PARTICLE EXAMINATION ASSIGNMENTS (List up to 12 MT assignments.)		EXPERIENCE AT EACH LEVEL OF MT CERTIFICATION From	To	Level	Type	Months
PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	10-26-83	01-04-84	Trainee	Nuclear	1.00
ISI: Nine Mile Point 1	PSI: Nine Mile Point 2	01-04-84	05-19-84	I	Nuclear	3.00
PSI: Shearon Harris 1	ISI: Turkey Point Unit 3	02-20-85	11-17-86	II	Nuclear	20.81
ISI: V. C. Summer Unit 1	ISI: Callaway Unit 1	11-17-86	08-29-87	II	Nuclear	3.75
PSI: Beaver Valley Unit 2	ISI: Wolf Creek Unit 1	03-04-88	02-20-91	II	Nuclear	34.50
ISI: Three Mile Island	ISI: Vermont Yankee	07-29-91	present	III	Nuclear	

See NES EXPERIENCE RECORD for additional NES MT certification dates. Total: 63.06

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	MT EXPERIENCE Level	Type	Months

Total: N/A

TOTAL EXPERIENCE: MT LEVEL II OR III EXPERIENCE: 4.92 years MT LEVEL II OR III NUCLEAR EXPERIENCE: 4.92 years

CERTIFICATION EXAMINATIONS

Basic Examination	90.50	(.25)	Exams administered:
General Examination	84.60	(.25)	05-22-91
Specific Examination	92.50	(.25)	Exams completed:
Practical Examination	86.30	(.25)	07-25-91
Composite Score	88.48		

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A
Initial Level III certification issued by NES: 07-29-91

CERTIFIED BY  7/29/91

LEVEL III EXAMINER

DATE OF CERTIFICATION 07-29-91
DATE OF EXPIRATION 05-22-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

File: Cliff Anderson

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL III

Cliff Anderson is qualified as Level III in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate William J. Bogan H. S. Chicago, Illinois	Date Completed: 06-01-79
COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-83

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	05-31-83	48.00
Nuclear Energy Services	Nine Mile Point Unit 1	Proc. Indoctrination	03-21-84	1.75
			Total:	49.75

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)		EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	10-26-83	01-04-84	Trainee	Nuclear	1.00
ISI: Nine Mile Point 1	PSI: Nine Mile Point 2	01-04-84	04-12-84	I	Nuclear	2.00
PSI: Shearon Harris 1	ISI: Turkey Point Unit 3	04-12-84	05-20-84	II	Nuclear	1.23
ISI: V. C. Summer Unit 1	ISI: Callaway Unit 1	08-03-84	04-02-87	II	Nuclear	31.00
PSI: Beaver Valley Unit 2	ISI: Wolf Creek Unit 1	08-14-87	08-02-90	II	Nuclear	35.61
ISI: Three Mile Island	ISI: Seabrook	08-02-90	07-29-91	II	Nuclear	12.00

See NES EXPERIENCE RECORD for additional NES PT certification dates. Total: 82.84

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
					Total:	N/A

TOTAL EXPERIENCE: PT LEVEL II OR III EXPERIENCE: 6.65 years PT LEVEL II OR III NUCLEAR EXPERIENCE: 6.65 years

CERTIFICATION EXAMINATIONS

Basic Examination	90.50	(.25)	Exams administered:
General Examination	86.15	(.25)	05-22-91
Specific Examination	77.50	(.25)	Exams completed:
Practical Examination	92.00	(.25)	07-25-91
Composite Score	86.54		

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A

Inital Level III certification issued by NES: 07-29-91

DATE OF CERTIFICATION: 07-29-91

DATE OF EXPIRATION: 05-22-96

CERTIFIED BY

7/29/91

LEVEL III EXAMINER

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

File: Cliff Anderson

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL III

Cliff Anderson is qualified as Level III in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 30A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate William J. Bogan H. S. Chicago, Illinois	Date Completed: 06-01-79	COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-83

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	05-31-83	153.00
Nuclear Energy Services	Wolf Creek Nuclear Site	R. C. Pump Flywheel	10-27-83	5.00
Nuclear Energy Services	Wolf Creek Nuclear Site	Heater Hole Studs	11-22-83	4.00
Nuclear Energy Services	Nine Mile Point Unit 1	IGSCC Scanning Tech.	03-20-84	4.00
Nuclear Energy Services	Nine Mile Point Unit 1	Proc. Indoctrination	03-29-84	2.50
Nuclear Energy Services	Nine Mile Point Unit 1	Nozzle Inner Radius	04-12-84	10.00
			Total:	256.50

See EDUCATION AND TRAINING RECORD for additional UT training entries.

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)		EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	07-17-83	01-04-84	Trainee	Nuclear	5.00
ISI: Nine Mile Point 1	PSI: Perry Unit 1	01-04-84	05-20-84	I	Nuclear	4.50
PSI: Nine Mile Point 2	PSI: Shearon Harris 1	08-03-84	05-22-85	I	Nuclear	9.50
ISI: Turkey Point Unit 3	ISI: V. C. Summer Unit 1	05-22-85	08-29-87	II	Nuclear/Non	10.25
ISI: Callaway Unit 1	PSI: Beaver Valley Unit 2	02-15-88	05-22-88	II	Nuclear	2.50
ISI: Wolf Creek Unit 1	ISI: Three Mile Island	06-02-88	05-16-91	II	Nuclear	34.50
					Total:	76.75

See NES EXPERIENCE RECORD for additional NES UT certification dates.

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
					Total:	N/A

TOTAL EXPERIENCE

UT LEVEL II OR III EXPERIENCE: 3.94 years UT LEVEL II OR III NUCLEAR EXPERIENCE: 3.08 years

CERTIFICATION EXAMINATIONS

Basic Examination	91.00	(.25)	Exams administered: 05-22-91
General Examination	84.60	(.25)	
Specific Examination	90.00	(.25)	Exams completed: 06-19-92
Practical Examination	92.73	(.25)	
Composite Score	89.58		

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A
Initial Level III certification issued by NES: 06-19-92

DATE OF CERTIFICATION 06-19-92
DATE OF EXPIRATION 05-22-96

CERTIFIED BY

6-19-92

LEVEL III EXAMINER

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

File: Cliff Anderson

CERTIFICATE OF QUALIFICATION

ULTRASONIC IGSCC SIZING

LEVEL II

Cliff Anderson is qualified as Level II in Ultrasonic IGSCC Sizing in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 30A9068, Revision 3, which incorporates the requirements of SNT-TC-1A, 1984 Edition. The written and practical examinations required for this certification were administered and graded by the EPRI NDE Center. The examination scores are based on EPRI's grading criteria. All examinations administered by EPRI are maintained by the EPRI NDE Center in Charlotte, North Carolina. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	Manual	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate William J. Bogan H. S. Chicago, Illinois	Date Completed: 06-01-79	COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-83

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	05-31-83	153.00
Nuclear Energy Services	Wolf Creek Nuclear Site	R. C. Pump Flywheel	10-27-83	5.00
Nuclear Energy Services	Wolf Creek Nuclear Site	Heater Hole Studs	11-22-83	4.00
Nuclear Energy Services	Nine Mile Point Unit 1	IGSCC Scanning Tech.	03-20-84	4.00
Nuclear Energy Services	Nine Mile Point Unit 1	Proc. Indoctrination	03-29-84	2.50
Nuclear Energy Services	Nine Mile Point Unit 1	Nozzle Inner Radius	04-12-84	10.00
			Total:	296.50
			IGSCC Sizing hours:	40.00

See EDUCATION AND TRAINING RECORD for additional UT training entries.

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)		EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	07-17-83	01-04-84	Trainee	Nuclear	5.20
ISI: Nine Mile Point 1	PSI: Perry Unit 1	01-04-84	05-20-84	I	Nuclear	4.50
PSI: Nine Mile Point 2	PSI: Sheafon Harris 1	08-03-84	05-22-85	I	Nuclear	9.50
ISI: Turkey Point Unit 3	ISI: V. C. Summer Unit 1	05-22-85	08-29-87	II	Nuclear/Non	10.25
ISI: Callaway Unit 1	PSI: Beaver Valley Unit 2	02-15-88	05-22-88	II	Nuclear	2.50
ISI: Wolf Creek Unit 1	ISI: Three Mile Island	06-02-88	05-16-91	II	Nuclear	34.50
					Total:	76.75

See NES EXPERIENCE RECORD for additional NES UT certification dates.

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
					Total:	N/A

TOTAL EXPERIENCE

76.75 months of experience in ultrasonic examination

CERTIFICATION EXAMINATIONS

General Examination	84.60	(.3)	Exams administered:
Specific Examination	80.00	(.2)	02-02-92
Practical Examination	80.00	(.5)	Exams completed:
Composite Score	81.38		02-07-92

INITIAL CERTIFICATION DATES

Prior employment initial IGSCC Sizing cert.:	N/A
NES initial IGSCC Sizing certification:	10-05-92

CERTIFIED BY

10.05.92

LEVEL III EXAMINER

DATE OF CERTIFICATION	10-05-92
DATE OF EXPIRATION	02-02-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

File: Cliff Anderson

CERTIFICATE OF QUALIFICATION

VISUAL EXAMINATION

LEVEL II

Cliff Anderson is qualified as Level II in Visual Examination in accordance with the requirements of Nuclear Energy Services' Procedure No. 2QAP-20, Revision 11, Certification of Visual Examination Personnel. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 2QAP-16, Revision 6.

CERTIFICATION RESTRICTIONS: None - VT-1, 2, 3, 4

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate William H. Bogan H. S. Chicago, Illinois	Date Completed: 06-01-79
COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: [illegible]

TRAINING

Institution Organization	Location	Type	Date Completed	Hours
[illegible] NDE Center	Chicago Section of ASNT	Selected Modules	04-13-83	12.00
[illegible] NDE Center	Danbury, Connecticut	Level II	01-27-84	40.00
[illegible] NDE Center	Danbury, Connecticut	Level II	03-17-84	40.00
Nuclear Energy Services	Three Mile Island Nuclear	VT II Refresher	03-01-87	16.00
Nuclear Energy Services	Danbury, Connecticut	VT Refresher	12-31-89	4.00
Nuclear Energy Services	Danbury, Connecticut	Leak Testing I, II	11-25-92	5.50
			Total:	124.00

NES EXPERIENCE

VISUAL EXAMINATION ASSIGNMENTS (List up to 12 VT assignments.)

		EXPERIENCE AT EACH LEVEL OF VT CERTIFICATION From	To	Level	Type	Months
PSI: Three Mile Island	PSI: Wolf Creek Unit 1	03-01-84	06-27-85	Trainee	Nuclear	5.33
PSI: Beaver Valley Unit 2	PSI: Brunswick Unit 2	07-26-85	09-30-86	"	Nuclear	14.16
PSI: Callaway Unit 1	PSI: V.C. Summer	09-21-86	02-17-87	"	Nuclear	4.83
PSI: Shearon Harris 1	PSI: Turkey Point Unit 3	03-04-87	05-05-87	"	Nuclear	2.16
PSI: Nine Mile Point 2	PSI: Nine Mile Point 1	07-31-87	09-30-87	"	Nuclear	3.66
PSI: South Texas Project	PSI: Shearon Harris	02-01-88	12-31-88	"	Nuclear	11.99
					Total:	42.73

See NES EXPERIENCE RECORD for additional VT experience.

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	VT EXPERIENCE Level	Type	Months

* Denotes non-continuous experience. Total: N/A

TOTAL EXPERIENCE: 42.73 months of visual examination/related inspection experience.

CERTIFICATION EXAMINATIONS

General Examination	95.70	(.3)	Exams administered: 02-11-93
Specific Examination	89.60	(.4)	
Practical Examination	98.50	(.3)	Exams completed: 02-11-93
Composite Score	96.23		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A

Initial Level II certification issued by NES: 02-25-85

DATE OF CERTIFICATION: 02-12-93

DATE OF EXPIRATION: 02-11-96

CERTIFIED BY: W. J. Maurer

President

~~LEVEL III EXAMINER~~

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Cliff Anderson

SS No.: 341-54-7134

CERTIFICATE OF QUALIFICATION

MECHANICAL

LEVEL II

Cliff Anderson is qualified as Level II in Mechanical Inspection in accordance with the requirements of Nuclear Energy Services' procedure for Qualification and Training of Quality Assurance and Quality Control Specialists. This Certification which incorporates the requirements of ANSI N45.2.6-1978, Reg. Guide 1.58 Rev. 1, and ANSI/ASME NQA-1 Supplement 2S-1 1983. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	None	SEE ATTACHED VISION ACUITY REPORT	
EDUCATION	High School Graduate William J. Bogan H.S. Chicago, Illinois	Date Completed: 06-01-79	
COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-83	

TRAINING

Instruction Organization	Location	Type	Date Completed	Hours
EPRI NDE Center	Chicago Section of ASNT	Selected VT Modules	04-12-93	13.00
EPRI NDE Center	Danbury, Connecticut	VT Level I	01-22-84	40.00
EPRI NDE Center	Danbury, Connecticut	VT Level II	02-17-84	40.00
Nuclear Energy Services	Three Mile Island Nuclear	VT II Refresher	03-01-87	24.00
Nuclear Energy Services	Danbury, Connecticut	VT II Refresher	02-11-93	9.50
			Total:	126.50

NES EXPERIENCE

MECHANICAL QC INSPECTION ASSIGNMENTS
(List up to 5 QC assignments.)

	EXPERIENCE AT EACH LEVEL OF QC CERTIFICATION				
	From	To	Level	Type	Months
Various	03-01-84	03-02-90	Rel.Exp	Nuclear	36.75
Various	03-02-90	02-15-93	II	Nuclear	20.00
	02-15-93	present	II	Nuclear	
				Total:	56.75

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	QC EXPERIENCE Level	Type	Months

* Non-continuous employment

Total: N A

TOTAL EXPERIENCE 56.75 months of experience in QA/QC related inspection.

CERTIFICATION EXAMINATIONS

General Examination	92.33	(.5)
Specific Examination	97.50	(.5)
Composite Score	89.87	

Exams administered: 02-12-93

Exams completed: 02-12-93

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N A
Initial Level II certification issued by NES: 03-02-90

DATE OF CERTIFICATION 02-15-93
DATE OF EXPIRATION 02-12-96

CERTIFIED BY

Mary Ellen Alling 2-15-93

LEVEL III EXAMINER

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 (203) 796-5000

CERTIFICATE OF QUALIFICATION

File: Cliff Anderson

SS No.: 341-54-7134

PIPING WELDING

LEVEL II

Cliff Anderson is qualified as Level II in Piping Welding Inspection in accordance with the requirements of Nuclear Energy Services' procedure for Qualification and Certification of Quality Assurance and Quality Control Specialists, which incorporates the requirements of ANSI N45.2.6 - 1978 and ANSI/ASNT CP-189-1991 Supplement 10-C. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	None	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Mount Carmel H.S. Chicago, Illinois	Date Completed: 06-11-79	COLLEGE OR TECHNICAL	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-91

TRAINING

Instruction Organization	Location	Type	Date Completed	Hours
ppg NDE Center	Chicago Section of ASNT	Selected VT Modules	04-13-93	19.00
ppg NDE Center	Danbury, Connecticut	VT Level II	03-12-93	40.00
ppg NDE Center	Danbury, Connecticut	VT Level II	03-07-93	40.00
Nuclear Energy Services	Three Mile Island Nuclear	VT II Refresher	02-01-93	16.00
Nuclear Energy Services	Danbury, Connecticut	VT II Refresher	02-11-93	21.50

Total: 116.50

NES EXPERIENCE

PIPING WELDING INSPECTION ASSIGNMENTS
(List up to 5 QC assignments.)

	EXPERIENCE AT EACH LEVEL OF QC CERTIFICATION				
	From	To	Level	Type	Months
Various	03-01-84	03-02-90	II	Nuclear	33.00
Various	03-02-90	02-15-93	II	Nuclear	35.75
	02-15-93	present	II	Nuclear	

Total: 68.75

PREVIOUS EXPERIENCE

		EMPLOYMENT DATES		QC EXPERIENCE		
Employer	Location	From	To	Level	Type	Months

* Non-continuous employment.

Total: N A

TOTAL EXPERIENCE 68.75 months of experience in QA/QC related inspection.

CERTIFICATION EXAMINATIONS

General Examination	32.33	(5)	Exams administered: 02-12-93
Specific Examination	40.30	(5)	
Composite Score	36.52		Exams completed: 02-12-93

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N A
Initial Level II certification issued by NES: 03-02-93

CERTIFIED BY

02-15-93

LEVEL III EXAMINER

DATE OF CERTIFICATION 02-15-93
DATE OF EXPIRATION 02-12-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

QUALIFICATION RECORD

Nondestructive Examination

NAME: Cliff Anderson

High School Graduate William J. Bogan H. S. Chicago, Illinois	Date Completed: 06-01-79	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 05-31-83	DATE OF EYE EXAM: 02-24-93 CORRECTIVE LENSES REQUIRED: Near: Yes Far: Yes EYE EXAM DUE: 02-24-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	20.00	Ultrasonics:	296.50	IGSCC Sizing:	40.00
Penetrant:	49.75	Visual:	126.50	Weld Overlay:	0.00
Radiography:	153.00	IGSCC Detection:	40.00	Nozzle Inner Radius:	25.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	73.81	0.00	73.81	Unrestricted
Penetrant:	93.59	0.00	93.59	Unrestricted
Radiography:	0.00	0.00	0.00	
Ultrasonics:	78.50	0.00	78.50	Unrestricted
Visual:	42.73	0.00	42.73	None - VT-1,2,3,4

DATE OF CURRENT CERTIFICATION

	Trainee	I	II	III
Magnetic Particle				07-29-91
Penetrant				07-29-91
Radiography				
Ultrasonics				06-19-92
Visual			02-12-93	
IGSCC Detection (Manual)				12-11-92
IGSCC Sizing (Manual)			10-05-92	02-02-95
Weld Overlay (Manual)				
Nozzle Inner Radius Qualification			04-12-84	

DATE OF EXPIRATION

	Trainee	I	II	III
Magnetic Particle				05-22-96
Penetrant				05-22-96
Radiography				
Ultrasonics				05-22-96
Visual			02-11-96	

PREVIOUS EMPLOYMENT INITIAL CERTIFICATION

	Trainee	I	II	III
Magnetic Particle				
Penetrant				
Radiography				
Ultrasonics				
Visual				
IGSCC Detection				12-05-86
IGSCC Sizing				10-05-92
Weld Overlay				

DATE OF INITIAL NES CERTIFICATION

	Trainee	I	II	III
Magnetic Particle	10-26-83	01-04-84	02-20-85	07-29-91
Penetrant	10-26-83	01-04-84	04-12-84	07-29-91
Radiography				
Ultrasonics	07-17-83	01-04-84	05-22-85	06-19-92
Visual	03-01-84		07-26-85	

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

7-28-93
Date

Nondestructive Examination

NAME: Cliff Anderson

EDUCATION AND TRAINING RECORD

Page: 1 of 3

EDUCATION

High School Graduate William J. Hogan H. S. Chicago, Illinois	Date Completed: 75-11-9	Nondestructive Evaluation Moraine Valley Community Coll. Palos Hills, Illinois	DEGREE: AAS Completed: 85-11-83	Education credited toward NDE certifications: 14 years

NDE CLASSROOM TRAINING

	INSTITUTION ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	N/A	05-31-83	80.00
					Total this page:	80.00
					TOTAL:	80.00
PT	Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	N/A	05-31-83	48.00
	Nuclear Energy Services	Nine Mile Point Unit 1	Proc. Indoctrination	NES 80A2819 Rev. 2	03-21-84	1.75
					Total this page:	49.75
					TOTAL:	49.75
RT	Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	N/A	05-31-83	153.00
					Total this page:	153.00
					TOTAL:	153.00
UT	Moraine Valley Comm. Coll	Palos Hills, Illinois	Theory and Lab	N/A	05-31-83	153.00
	Nuclear Energy Services	Wolf Creek Nuclear Site	R. C. Pump Flywheel	NES 80A4563, 80A4557	10-27-83	5.00
	Nuclear Energy Services	Wolf Creek Nuclear Site	Heater Hole Studs	NES 80A4884	11-22-83	4.00
	Nuclear Energy Services	Nine Mile Point Unit 1	IGSCC Scanning Tech.	NES 80A2818	03-20-84	4.00
	Nuclear Energy Services	Nine Mile Point Unit 1	Proc. Indoctrination	NES 80A2308, 80A2818	03-29-84	2.50
	Nuclear Energy Services	Nine Mile Point Unit 1	Nozzle Inner Radius	N/A	04-12-84	10.00
	See next page for additional UT entries.				Total this page:	178.50
					TOTAL:	296.50
	IGSCC Detection Hrs: 40.00 IGSCC Sizing Hrs: 40.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 25.00					
VT	EPRI NDE Center	Chicago Section of ASNT	Selected Modules	N/A	04-13-83	18.00
	EPRI NDE Center	Danbury, Connecticut	Level I	N/A	01-27-84	40.50
	EPRI NDE Center	Danbury, Connecticut	Level II	N/A	02-17-84	40.00
	Nuclear Energy Services	Three Mile Island Nuclear	VT II Refresher	NES Outline VT-Ref-2	02-01-87	16.00
	Nuclear Energy Services	Danbury, Connecticut	VT Refresher	N/A	12-21-89	4.00
	Nuclear Energy Services	Danbury, Connecticut	Leak Testing L II	N/A	11-25-92	5.00
					Total this page:	124.00
					TOTAL:	126.50

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling — Technical Director's Designee

2-15-93 — Date

Nondestructive Examination

EDUCATION AND TRAINING RECORD

NAME: Cliff Anderson

NDE CLASSROOM TRAINING

	INSTITUTION ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT						
PT						
RT						
UT	Nuclear Energy Services	Shearon Harris Nuclear	R. C. Pump Flywheels	NES 83A0285 Rev. 0	02-02-85	5.00
	Nuclear Energy Services	Danbury, Connecticut	R. C. Pump Flywheels	NES 83A1015 Rev. 1	03-28-85	4.00
	Nuclear Energy Services	Beaver Valley Unit 2	Shippingport, PA	UT300, 301, 303	06-04-85	8.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Detection	N/A	09-30-86	40.00
	Nuclear Energy Services	Danbury, Connecticut	Nozzle Inner Radius	NES 83A1725	10-25-86	12.00
	Nuclear Energy Services	Danbury, Connecticut	RC Pump Flywheel	N/A	10-25-86	1.00

See next page for additional UT entries. Total this page: 69.00

IGSCC Detection Hrs: 40.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 15.00

VT	Nuclear Energy Services	Danbury, Connecticut	Level II Refresher	N/A	02-11-93	2.50

Total this page: 2.50

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

2-15-93
Date

NAME: Cliff Anderson

EDUCATION AND TRAINING RECORD

Nondestructive Examination

NDE CLASSROOM TRAINING

	INSTITUTION ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
VT						
PT						
RT						
UT	Nuclear Energy Services	Danbury, Connecticut	Stud Bore Probe	NES 83A1731, Rev. 1	11-11-86	4.00
	Nuclear Energy Services	Vermont Yankee Nuc. Plant	Nozzle Inner Radius	N/A	08-05-89	5.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Sizing	N/A	02-07-92	40.00
					Total this page:	49.00
	IGSCC Detection Hrs: 0.00	IGSCC Sizing Hrs: 40.00	Weld Overlay Hrs: 0.00	Nozzle Inner Radius Hrs: 5.00		
ET						

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

2-15-93
Date

NES EXPERIENCE RECORD

Nondestructive Examination

NAME: Cliff Anderson

	NDE ASSIGNMENTS (List assignments in which the individual was working in the capacity for which he was certified.)		EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT	PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	10-26-83	01-04-84	Trainee	Nuclear	2.33
	PSI: Nine Mile Point 1	PSI: Nine Mile Point 2	01-04-84	04-12-84	I	Nuclear	3.33
	PSI: Shearon Harris 1	PSI: Turkey Point Unit 3	04-11-84	08-20-84	II	Nuclear	4.33
	ISI: V. C. Summer Unit 1	PSI: Callaway Unit 1	08-03-84	04-02-87	II	Nuclear	31.00
	PSI: Beaver Valley Unit 2	PSI: Wolf Creek Unit 1	09-14-87	08-30-90	II	Nuclear	35.67
	ISI: Three Mile Island	ISI: Vermont Yankee	07-29-91	10-01-91	III	Nuclear	3.00
						Total this page:	49.26
	See next page for additional MT entries.					TOTAL:	73.91
PT	PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	10-26-83	01-04-84	Trainee	Nuclear	2.33
	PSI: Nine Mile Point 1	PSI: Nine Mile Point 2	01-04-84	04-12-84	I	Nuclear	3.33
	PSI: Shearon Harris 1	PSI: Turkey Point Unit 3	04-11-84	08-20-84	II	Nuclear	4.33
	ISI: V. C. Summer Unit 1	PSI: Callaway Unit 1	08-03-84	04-02-87	II	Nuclear	31.00
	PSI: Beaver Valley Unit 2	PSI: Wolf Creek Unit 1	09-14-87	08-30-90	II	Nuclear	35.67
	ISI: Three Mile Island	ISI: Seabrook	08-02-90	07-29-91	II	Nuclear	11.50
						Total this page:	92.84
	See next page for additional PT entries.					TOTAL:	93.59
RT							
						TOTAL:	1.00
UT	PSI: Wolf Creek Unit 1	PSI: Callaway Unit 1	07-17-83	01-04-84	Trainee	Nuclear	5.00
	PSI: Nine Mile Point 1	PSI: Perry Unit 1	01-04-84	05-20-84	I	Nuclear	4.33
	PSI: Nine Mile Point 1	PSI: Shearon Harris 1	08-03-84	05-22-85	I	Nuclear	9.67
	PSI: Turkey Point Unit 3	ISI: V. C. Summer Unit 1	05-22-85	08-29-87	II	Nuclear Non	15.33
	PSI: Callaway Unit 1	PSI: Beaver Valley Unit 2	02-15-88	05-22-90	II	Nuclear	27.33
	ISI: Wolf Creek Unit 1	ISI: Three Mile Island	06-02-90	05-16-91	II	Nuclear	34.50
						Total this page:	96.25
	See next page for additional UT entries.					TOTAL:	79.59
VT	ISI: Three Mile Island	ISI: Wolf Creek Unit 1	03-01-84	06-27-85	Trainee	Nuclear	5.00
	PSI: Beaver Valley Unit 2	ISI: Brunswick Unit 2	04-26-85	09-23-86	II	Nuclear	17.00
	ISI: Callaway Unit 1	ISI: V.C. Summer	09-23-86	02-17-87	II	Nuclear	4.67
	PSI: Shearon Harris 1	ISI: Turkey Point Unit 3	03-04-87	06-25-87	II	Nuclear	3.67
	PSI: Nine Mile Point 2	ISI: Nine Mile Point 1	07-31-87	09-30-87	II	Nuclear	2.00
	ISI: South Texas Project	ISI: Shearon Harris	02-01-88	12-01-89	II	Nuclear	5.00
						Total this page:	33.99
	See next page for additional VT entries.					TOTAL:	42.73

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

2-12-93
Date

NES EXPERIENCE RECORD

Nondestructive Examination

NAME: Cliff Anderson

	NDE ASSIGNMENTS List assignments in which the individual was working in the facility for which he was certified	FROM	TO	LEVEL	TYPE	HOURS
MT	Three Mile Island	11-11-91	present	III	Nuclear	1,111
	Callaway	10-10-92	01-31-93	III	Nuclear	616
	Seabrook	10-01-92	10-09-92	III	Nuclear	72
	Seabrook	07-29-91	10-01-91	III	Nuclear	1,000
	Shearon Harris	07-31-92	09-11-92	III	Nuclear	616
	Oyster Creek	09-14-92	09-30-92	III	Nuclear	224
	Calvert Cliffs	10-12-92	present	III	Nuclear	1,111
					Total this page:	5,752
PT	Seabrook	07-29-91	10-01-91	III	Nuclear	1,000
	Three Mile Island	10-01-91	11-01-91	III	Nuclear	1,111
	Callaway	10-10-92	01-15-93	III	Nuclear	1,111
	Seabrook	10-01-92	10-31-92	III	Nuclear	1,111
	Shearon Harris	10-31-92	11-15-92	III	Nuclear	1,111
	Oyster Creek	11-11-92	01-31-92	III	Nuclear	1,111
					Total this page:	6,755

See next page for additional PT entries.

PT

UT	Seabrook	07-29-91	10-01-91	II	Nuclear	1,000
	Three Mile Island	10-01-91	11-01-91	II	Nuclear	1,111
	Big Rock Point	01-02-92	01-15-92	II	Nuclear	1,111
	Arkansas Nuclear One	02-24-92	03-16-92	II	Nuclear	1,111
	Callaway	09-10-92	09-17-92	II	Nuclear	1,111
	Millstone	05-25-92	06-01-92	III	Nuclear	1,111
					Total this page:	7,445

See next page for additional UT entries.

VT	Seabrook	07-29-91	10-01-91	II	Nuclear	1,000
	Three Mile Island	10-01-91	11-01-91	II	Nuclear	1,111
	Callaway	09-10-92	09-17-92	II	Nuclear	1,111
	Seabrook	10-01-92	10-31-92	II	Nuclear	1,111
	Shearon Harris	10-31-92	11-15-92	II	Nuclear	1,111
	Oyster Creek	11-11-92	01-31-92	II	Nuclear	1,111
					Total this page:	6,755

See next page for additional VT entries.

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 90A9058 and/or 90A0063.

Mary-Ellen Alling
Technical Director's Designee

2-12-93
Date

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

NES EXPERIENCE RECORD

Nondestructive Examination

NAME: Clifford A Anderson

NDE ASSIGNMENTS (list assignments in which the individual was working in the capacity for which he was certified)		EXPERIENCE AT EACH LEVEL OF CERTIFICATION				
		FROM	TO	LEVEL	TYPE	MONTHS
VT						
PT	USI: Calvert Cliffs	02-16-93	present	III	Nuclear	
BT						
UT	USI: Seabrook	09-07-92	10-31-92	III	Nuclear	1.80
	USI: Shearon Harris	07-27-92	09-04-92	III	Nuclear	1.20
	USI: Oyster Creek	11-25-92	01-31-92	III	Nuclear	2.20
	USI: Calvert Cliffs	02-16-93	present	III	Nuclear	
					Total this page:	4.80
VT	USI: Calvert Cliffs	02-16-93	present	II	Nuclear	

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 90A9060 and or 90A9069.

Mary-Ellen Alling
Technical Director's Designee

3-12-93
Date

Resume for
Clifford A. Anderson

EXPERIENCE SUMMARY

Employed with Nuclear Energy Services as NDE Level III/NDE Coordinator and have been performing ASME Section XI NDE programs for approximately ten years. NDE experience consists of numerous inservice and preservice nuclear inspection assignments, as well as participating in several plant life extension programs and boiler assessment programs of fossil fuel power plants. Qualified through EPRI NDE Center in Visual Examination and Ultrasonic IGSCC Detection and Sizing.

EXPERIENCE

02/15/88 to Present	NUCLEAR ENERGY SERVICES, INC. Danbury, Connecticut
09/02/92 to Present	Seabrook - Assigned to site as ISI Shift NDE Lead and Level III UT, MT, PT and Level II VT.
05/25/92 to 08/92	Millstone - Performed Level III Review of Erosion/Corrosion UT Data Packages.
03/18/92 to 04/17/92	Callaway - Performed Level III MT, PT and Level II UT and VT ISI examinations on balance-of-plant piping and components. Performed Remote VT-1 and VT-3 Visual examination of the Reactor using a Benthos Mini Sub.
02/24/92 to 03/16/92	Arkansas Nuclear One - Performed erosion/corrosion UT examinations on selected pipe locations, UT ISI examinations.
01/02/92 to 01/16/92	Big Rock Point - Performed Level II UT IGSCC inspections.
10/91 to 11/91	Three Mile Island - Performed UT, MT, PT and VT on balance-of-plant piping. Certified Level III in MT, PT, Level II UT, VT, Mechanical and Welding.
07/91 to 10/91	Seabrook - Performed Level III MT and PT and Level II UT and VT examinations. Performed Remote VT-1 and VT-3 Visual examination of the Reactor using a Benthos Mini Sub.
04/91 to 07/91	Seabrook - Performed 100% review of all field weld radiographs to address concerns of the U.S. Congress and comply with the requirements of the Nuclear Regulatory Commission.
03/91 to 04/91	Shearon Harris - Performed Level II UT, MT, PT and VT ISI examinations on balance-of-plant piping and components. Performed Remote VT-1 and VT-3 Visual examination of the Reactor using a Benthos Mini Sub.
02/91 to 03/91	Arkansas Nuclear One - Performed erosion/corrosion UT examinations on selected pipe locations and flywheel UT ISI examinations.
09/90 to 01/91	Brunswick - Supervised ISI UT examinations on balance-of-plant piping and components and erosion/corrosion program.
06/04/90 to 09/90	Duane Arnold - ISI, Assigned to Site as a Level II QC weld and mechanical inspector.
03/12/90 to 05/11/90	V.C. Summer - Supervised and performed Level II UT IGSCC, MT, PT and VT ISI examinations on balance-of-plant piping and components. Performed Remote VT-1 and VT-3 Visual examination of the Reactor using Benthos Mini Sub.
02/90 to 03/90	Sutton - Supervised and performed Level II UT, MT and VT ISI examinations on balance-of-plant piping as part of a Remaining Plant Life Program.

EXPERIENCE (Continued)

02/09/90 to 02/16/90 — Oyster Creek - Supervised and performed Level II UT and VT ISI examinations and assisted in RT examinations during an unscheduled outage.

01/08/90 to 02/08/90 — Three Mile Island - Performed Level II UT IGSCC, MT, PT and VT ISI examinations on balance-of-plant piping and components.

10/21/89 to 12/15/89 — Shearon Harris - Performed Level II UT, MT, PT and VT ISI examinations on balance-of-plant piping and components. Performed Remote Visual examination on Reactor using a Benthos Mini Sub.

10/16/89 to 10/19/89 — Cape Industries - Performed Level II UT IGSCC detection examinations.

04/10/88 to 09/29/89 — South Texas Project - Assigned to Support Engineering as NDE/ISI Coordinator of ASME Section XI Inspections of Units 1 and 2. Participated in coordinating the Inservice Inspection Program and in preparing and initiating the Erosion/ Corrosion Program.

09/87 to 02/88 — FAILURE ANALYSIS ASSOCIATES
Washington, D.C. Office
NDE Technical Engineer

Assignments:

Chalk Point Power Station, Maryland - Performed replication of welds on Hot Reheat and Main Steam piping as part of a plant life extension program.

Glyn Llyn Power Station, Virginia - Performed remote excavations of MT indications in a rotor bore for metallurgical studies using a newly developed instrument referred to as the Divot Digger.

Turkey Point Unit 2, Florida - Performed Level II VT-1, alloy analysis and replication of welds on Hot Reheat and Main Steam piping as part of a plant life extension program.

Chesterfield Unit 5, Virginia - Performed Remote Level II VT-1 inspection on the several headers of this unit using Welsh Allyn Video Probe.

Norwalk Harbor Unit 1, Connecticut - Performed Level II UT examinations of the Hot Reheat and Main Steam piping welds and hardness tests of replicated areas of the system.

Newington Unit 1, New Hampshire - Performed Level II UT and MT examinations of the Hot Reheat and Main Steam piping welds and erosion/corrosion examinations of selected Feedwater locations.

East River Units 5 & 6, New York - Performed UT crack sizing (using the satellite pulse technique) on the Superheater Outlet Headers - Ligament cracking.

07/11/83 to 08/23/87 — NUCLEAR ENERGY SERVICES, INC.
Cary, North Carolina
Senior NDE Examiner

Assignments:

08/02/87 to 08/29/87 — Vermont Yankee - ISI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components. Performed Level II UT of selected reactor vessel welds.

05/04/87 to 05/14/87 — Manatee Unit 2 - Fossil plant inspection. Performed Level II UT and MT examinations of the Hot Reheat piping system.

EXPERIENCE (Continued)

04/19/87 to 05/03/87	Riveria Unit 4 - Fossil plant inspection. Supervised and performed Level II UT and MT examinations of the Hot Reheat piping system.
04/13/87 to 04/18/87	Port Everglades Unit 1 - Fossil plant inspection. Performed Level II UT and MT examinations of the Hot Reheat piping system.
12/08/86 to 03/87	Three Mile Island - ISI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components.
10/86 to 11/22/86	Wolf Creek - ISI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components. Performed Level II UT examinations of the reactor coolant pump flywheel, Level II UT nozzle inner radius examinations and Level II UT examinations of the reactor closure head and studs.
06/86 to 07/15/86	Beaver Valley Unit 2 - PSI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components and Level II UT weld overlay examinations of RHR piping.
05/86 to 06/86	Brunswick Unit 2 - ISI, Performed Level II VT 1-4 examinations of the reactor pressure vessel and balance-of-plant piping and components.
04/86 to 05/86	Callaway Unit 1 - ISI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components and Level II UT examinations of the reactor coolant pump flywheel.
12/85 to 04/86	Brunswick Unit 2 - ISI, Performed Level II VT 1-4 examinations of the reactor pressure vessel and balance-of-plant piping and components.
10/85 to 12/85	V.C. Summer Unit 1 - ISI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components, and Level II UT examinations of the reactor coolant pump flywheel. Assigned for one month as a QA/QC Inspector to perform fit-up and snubber inspections.
06/85 to 10/85	Shearon Harris - PSI, Performed Level II UT, MT, PT and VT 1-4 examinations of balance-of-plant piping and components.
04/85 to 06/85	Turkey Point Unit 3 - ISI, Performed Level II UT, MT, PT and VT-3 examinations of balance-of-plant piping, components, nozzles and the steam generator. Received 10 hours training in UT exams on known defects standards (CS and SS piping).
02/85 to 04/85	Shearon Harris - PSI, Performed Level II MT, PT, VT 1-4 and Level I UT examinations on balance-of-plant piping, components and the steam generator.
01/85 to 02/85	Nine Mile Point Unit 2 - PSI, Performed Level II MT, PT, VT 1-4 and Level I UT examinations of the reactor pressure vessel and balance-of-plant piping, components, and the steam generator.
09/84 to 11/25/84	Perry Unit 1 - PSI, Performed Level I automated ultrasonic examination of the reactor vessel and nozzles.
03/84 to 05/20/84	Nine Mile Point Unit 1 - ISI, Performed Level II PT, Level I UT, MT and assisted in visual examinations of the reactor pressure vessel and balance-of-plant piping and components.
02/84 to 03/84	Callaway Unit 1 - PSI, Performed Level I UT, MT and PT examinations of balance-of-plant piping, components and the steam generator.

EXPERIENCE (Continued)

07/83 to 02/84 — Wolf Creek - PSI, Initially assigned to site as a trainee in UT, MT and PT. On completion of experience requirements, performed Level I UT, MT and PT examinations of balance-of-plant piping, components and the steam generator.

CERTIFICATIONS

Magnetic Particle Examination	Level III	Visual Examination (EPRI)	Level II
Penetrant Examination	Level III	QC Mechanical	Level II
Ultrasonic Examination	Level III	QC Welding	Level II
UT IGSCC Detection (EPRI)	Level II	UT IGSCC Sizing (EPRI)	Level II

NDE TRAINING

Completed the following NDE training at Moraine Valley Community College:

153 hours Radiography
153 hours Ultrasonics
40 hours Magnetic Particle
28 hours Liquid Penetrant
90 hours Eddy Current
12 hours Leak Testing

80 hours	Visual Examination	EPRI NDE Center	Charlotte, NC
10 hours	Nozzle Inner Radius Examination	Nine Mile Point Unit 1	Scriba, NY
40 hours	Ultrasonics - IGSCC	EPRI NDE Center	Charlotte, NC
5 hours	Reactor Coolant Pump Flywheel	Wolf Creek	Burlington, KS
4 hours	Reactor Coolant Pump Stud	Wolf Creek	Burlington, KS
5 hours	Reactor Coolant Pump Flywheel	Shearon Harris	New Hill, NC
3 hours	Reactor Coolant Pump Flywheel	Callaway	Fulton, MO
4 hours	Reactor Coolant Pump Flywheel	Wolf Creek	Burlington, KS
10 hours	Nozzle Inner Radius Examination	Wolf Creek	Burlington, KS
40 hours	Ultrasonics - IGSCC Sizing	EPRI NDE Center	Charlotte, NC

EDUCATION

1983	A.A.S Degree in Nondestructive Examination Moraine Valley Community College, Palos Hills, Illinois
1980-81	Attended Southern Illinois University, Chicago, Illinois
1979-80	Attended Richard J. Daley College, Chicago, Illinois
1979	William J. Bogan High School graduate, Chicago, Illinois

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All information supplied by me to compile this resume is accurate to the best of my knowledge.

10/8/92
Clifford A. Anderson — Date

The information required for Level III certification has been verified.

Mary-Ellen Alling 10-16-92
Mary-Ellen Alling — Date

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT [illegible]

VISION ACUITY EXAMINATION REPORT

Name: Chris Judd SSN: 536-50-8992 Date: 9-8-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J	J 1
Left Eye	J	J 1
	Pass (Fail)	(Pass)/Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/	20/ 20
Left Eye	20/	20/ 20
	Pass (Fail)	(Pass)/Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Examined by	Title	Date
[signature]	LIII	9-8-93

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* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Chris Judd

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL II

Chris Judd is qualified as Level II in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 10, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS: Color Contrast Only

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	Gen. Educational Development State of Washington Ft. Lewis, Washington	Date Completed: 01-01-68	COLLEGE OR TECHNICAL	Nondestructive Testing Hutchinson Technical College Hutchinson, Minnesota	DEGREE: Yes Completed: 01-28-91

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	01-28-91	55.00

Total: 55.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (list up to 12 PT assignments.)	EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
ISI: H.B. Robinson			II	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
Ronald Misbet	San Pedro, California	11-28-83	10-01-87	II	Non-nuclear	11.75
SSI Technical Services	Houston, Texas	03-01-92	04-30-92	II	Nuclear	1.60

* Denotes non-continuous experience.

Total: 13.35

TOTAL EXPERIENCE: 13.35 months of experience in penetrant examination

CERTIFICATION EXAMINATIONS

General Examination	90.00	(.3)	Exams administered: 09-08-93
Specific Examination	85.00	(.2)	
Practical Examination	98.00	(.5)	Exams completed: 09-09-93
Composite Score	93.00		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 11-28-83
Initial Level II certification issued by NES: 09-10-93

CERTIFIED BY

Scott Lawson 9-10-93

LEVEL III

DATE OF CERTIFICATION 09-10-93
DATE OF EXPIRATION 09-08-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

File: Chris Judd

CERTIFICATE OF QUALIFICATION

Reissued to correct examination scores.
Date of certification remains 9-10-93.

ULTRASONIC EXAMINATION

LEVEL II

Chris Judd is qualified as Level II in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	None	SEE ATTACHED VISION ACUITY REPORT

EDUCATION

Gen. Educational Development State of Washington Ft. Lewis, Washington	Date Completed:	01-01-68

COLLEGE OR TECHNICAL

Nondestructive Testing Hutchinson Technical College Hutchinson, Minnesota	DEGREE: Yes Completed:	01-28-91

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	01-28-91	180.00
Panametrics, Inc.	Waltham, Massachusetts	Detection & Sizing	11-22-91	40.00
College of Oceaneering	Los Angeles, California	Level I	05-10-83	40.00
			Total:	260.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: H.B. Robinson			II	Nuclear	
				Total:	N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
Ronald Nisbet	San Pedro, California	11-28-83	10-01-87	II	Non-nuclear	11.75
MMP Quality Inspections	Long Beach, California	01-01-91	10-01-91	II	Non-nuclear	10.00
SSI Technical Services	Houston, Texas	03-01-92	04-30-92	II	Nuclear	1.60
Cramer & Lindell Eng.	Niantic, Connecticut	05-01-92	10-01-92	II	Nuclear	3.35
				Total:		26.70

* Denotes non-continuous experience.

TOTAL EXPERIENCE

26.70 months of experience in ultrasonic examination

CERTIFICATION EXAMINATIONS

General Examination	95.00	(.3)	Exams administered:
Specific Examination	85.00	(.2)	09-07-93
Practical Examination	90.00	(.5)	Exams completed:
Composite Score	90.50		09-08-93

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 11-28-83
Initial Level II certification issued by NES: 09-10-93

CERTIFIED BY

Scott Lawson 9-10-93

LEVEL III

DATE OF CERTIFICATION 09-10-93
DATE OF EXPIRATION 09-07-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes — NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Chris Judd

Gen. Educational Development State of Washington Ft. Lewis, Washington	Date Completed: 01-01-68	Nondestructive Testing Hutchinson Technical College Hutchinson, Minnesota	DEGREE: Yes Completed: 01-28-91	DATE OF EYE EXAM: 09-08-93 CORRECTIVE LENSES REQUIRED: Near: Yes Far: Yes EYE EXAM DUE: 09-08-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	45.00	Ultrasonics:	260.00	IGSCC Sizing:	0.00
Penetrant:	55.00	Visual:	85.00	Weld Overlay:	0.00
Radiography:	160.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:		21.75	21.75	
Penetrant:		13.35	13.35	Color Contrast Only
Radiography:		0.00	0.00	
Ultrasonics:		26.70	26.70	None
Visual:		52.92	52.92	

	DATE OF CURRENT CERTIFICATION				DATE OF EXPIRATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle								
Penetrant			09-10-93				09-08-96	
Radiography								
Ultrasonics			09-10-93				09-07-96	
Visual								
IGSCC Detection (Manual)								
IGSCC Sizing (Manual)								
Weld Overlay (Manual)								
Nozzle Inner Radius Qualification								

	PREVIOUS EMPLOYMENT INITIAL CERTIFICATION				DATE OF INITIAL NES CERTIFICATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle								
Penetrant			11-28-83				09-10-93	
Radiography								
Ultrasonics			11-28-83				09-10-93	
Visual								
IGSCC Detection								
IGSCC Sizing								
Weld Overlay								

All certifications and supporting documentation are contained in this individual's certification file.

Mary Ellen Alling
Technical Director's Designee

9-10-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

EDUCATION AND TRAINING RECORD

NAME: Chris Judd

Nondestructive Examination

EDUCATION

Gen. Educational Development State of Washington Ft. Lewis, Washington	Date Completed: 01-01-68	Nondestructive Testing Hutchinson Technical College Hutchinson, Minnesota	DEGREE: Yes Completed: 01-28-91	Education credited toward NDE certifications: 12 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	01-28-91	45.00
					Total this page:	45.00
					TOTAL:	45.00
PT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	01-28-91	55.00
					Total this page:	55.00
					TOTAL:	55.00
	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	01-28-91	160.00
					Total this page:	160.00
					TOTAL:	160.00
UT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	01-28-91	180.00
	Panametrics, Inc.	Waltham, Massachusetts	Detection & Sizing	N/A	11-22-91	40.00
	College of Oceaneering	Los Angeles, California	Level I	N/A	05-10-83	40.00
					Total this page:	260.00
					TOTAL:	260.00
	IGSCC Detection Hrs: 0.00	IGSCC Sizing Hrs: 0.00	Weld Overlay Hrs: 0.00	Nozzle Inner Radius Hrs:		0.00
VT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	01-28-91	85.00
					Total this page:	85.00
					TOTAL:	85.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-10-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NE: Chris Judd

NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT					
				TOTAL:	0.00
PT ISI: H.B. Robinson			II	Nuclear	
				TOTAL:	0.00
RT					
				TOTAL:	0.00
UT ISI: H.B. Robinson			II	Nuclear	
				TOTAL:	0.00
VT					
				TOTAL:	0.00

The NES experience required for certification documented in this individual's certification .e in accordance with NES Document 80A9068 and/or 80A9069.

Mary Ellen Allen
Technical Director's Designee

9-10-93
Date

nes — NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Chris Judd

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT	Ronald Nisbet	San Pedro, California	Non-nuclear	11-28-83	10-01-87	11.75	II
	MMP Quality Inspections	Long Beach, California	Non-nuclear	01-01-91	10-01-91	10.00	II
					Total this page:	21.75	
					TOTAL:	21.75	
PT	Ronald Nisbet	San Pedro, California	Non-nuclear	11-28-83	10-01-87	11.75	II
	SSI Technical Services	Houston, Texas	Nuclear	03-01-92	04-30-92	1.60	II
					Total this page:	13.35	
					TOTAL:	13.35	
RT							
					TOTAL:	0.00	
UT	Ronald Nisbet	San Pedro, California	Non-nuclear	11-28-83	10-01-87	11.75	II
	MMP Quality Inspections	Long Beach, California	Non-nuclear	01-01-91	10-01-91	10.00	II
	SSI Technical Services	Houston, Texas	Nuclear	03-01-92	04-30-92	1.60	II
	Cramer & Lindell Eng.	Niantic, Connecticut	Nuclear	05-01-92	10-01-92	3.35	II
					Total this page:	26.70	
					TOTAL:	26.70	
VT	Ronald Nisbet	San Pedro, California	Non-nuclear	11-28-83	10-01-87	47.00	II
	SSI Technical Services	Houston, Texas	Nuclear	03-01-92	04-30-92	1.60	II
	Cramer & Lindell Eng.	Niantic, Connecticut	Nuclear	05-01-92	10-01-92	4.32	II
					Total this page:	52.92	
					TOTAL:	52.92	

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-10-93
Date

Resume for
Chris D. Judd

EDUCATION

05/92 NATIONAL ASSOCIATION OF CORROSION ENGINEERS, Midland, Texas
Basic Coating Inspection

01/92 AMERICAN WELDING SOCIETY, New Orleans, Louisiana
Welding Inspection Seminar (CWI)

11/91 PANAMETRICS, INC., (Hellier Associates, Inc.) Waltham, Massachusetts
Advanced Detection and Sizing (UT), IGSCC Detection, Discrimination, and Characterization Techniques using the following techniques: ID Creeping Wave Detection, Tip Diffraction, Bi-Modal, High Angle Refracted Longitudinal Wave.

01/91 HUTCHINSON TECHNICAL COLLEGE, Hutchinson, Minnesota
NDT Technology Graduate - Radiography, Ultrasonic, Eddy Current, Magnetic Particle, Visual Inspection, Acoustic Emission, with training in both Physical and Mechanical Metallurgy and Welding.

07/83 COLLEGE OF OCEANEERING, Los Angeles Harbor, California
Underwater UT and Lamination Testing, Magnetic Particle Testing.

06/81 PRODIVE COMMERCIAL DIVING CENTER, Falmouth Docks, Cornwall, United Kingdom
NDT Diver Inspector, UT, MT, VT. Certification to CSWIP Phase 7.

04/80 PRODIVE COMMERCIAL DIVING CENTER, Falmouth Docks, Cornwall, United Kingdom
Underwater NDT Technician Grade I, UT and Lamination Testing, MT, Corrosion Potential Measurement, Video Weld Survey.

EXPERIENCE SUMMARY

Over thirteen years experience in NDT and VISUAL inspection, with assignments that encompass offshore oil platforms, shipyards, refineries, nuclear power plants, and fossil fuel plants.

EXPERIENCE

09/93 to Present — NES, Inc., Danbury, Connecticut

11/92 to 08/93 — KOCH REFINERY, Rosemount, Minnesota

Welding Engineer/Unit Inspector - Clean Fuel Project. Inspection of vessels, towers, exchangers and heaters to ASME Section VIII Division 1. Inspection of piping to ANSI B31.3. Inspection of tanks to API 650. Inspection of underground piping for field coating.

10/92 to 11/92 — PETRO CHEM INTERNATIONAL CORP., Dallas, Texas

AWS CWI work to ASME Section I and Section VIII, B31.1 and B31.3. Assigend to Occidental Chemical Corp. in Lake Charles, Louisiana. Assigned duties included radiographer coordinator, off-site capital projects, QA, QC, mechanical inspection and NDT of piping and vessels.

05/92 to 10/92 — CRAMER & LINDELL ENGINEERS, Inc., Niantic, Connecticut

Certified Level II in UT, MT, PT and VT-1. Assigned to Millstone nuclear plant performing Erosion/Corrosion. Qualified by NU for ISI in UT, MT, PT and VT. Worked to ASME Section XI.

EXPERIENCE (Continued)

02/92 to 05/92 — SONIC SYSTEMS INTERNATIONAL, Houston, Texas

Certified Level II in UT, MT, PT and VT. Assigned to Sequoyah nuclear plant. Performed ASME Section XI Shear wave, WSY70, Refracted Longitudinal Wave. Qualified by TVA for ISI in UT, MT and PT.

01/91 to 10/91 — MMP QUALITY INSPECTIONS, Inc., Portland, Oregon

Certified Level II UT and MT. Ultrasonic weld inspection to ABS including inspection to Navsea 3010 and MILSTD 271F.

10/88 to 12/88 — RICHARDSON X-RAY, Inc., Alhambra, California

Certified to Level II in UT, MT and PT. Assigned to Southern California Edison fossil fuel plants. Worked to ASME Section V.

10/87 to 03/88 — NORTHWEST MARINE IRON WORKS, Portland, Oregon

Certified to Level II in UT, MT and PT. Performed Shearwave inspection to Navsea 3010 and MILSTD 271F.

10/83 to 10/87 — RONALD NISBET & ASSOCIATES, Inc., San Pedro, California

Certified to Level II in UT, MT, PT and VT. Shearwave to Navsea 3010 and MILSTD 271F and AWS D1.1 and ASME Section V.

NUCLEAR ENERGY SERVICES, INC.

PERSONNEL PERFORMANCE QUALIFICATION SHEET

Procedure No.	Revision	Addenda No./ Field Change No.
SP 6225 (NES 83A6083 R.3)	0	N/A

Title:	UT Exam of Bolting

Personnel	Certification Level	
Chris Judd	II	Date: 10 18 93
		Date: / /

Component ID: CPL 62

Test Results: Pass ☒ Fail ☐

Limitations/Restrictions: No ☒ Yes ☐ *(See Below)*

Witness: Scott [illegible] UT Level: III Date: 10 18 93

Authorized Inspection Agency: (Optional) _____ Date: / /

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203-796-5000

VISION ACUITY EXAMINATION REPORT

Name: Scott Larson SSN: 223-72-4324 Date: 3-4-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J-1	J N/A
Left Eye	J-1	J N/A
	(Pass)/Fail	Pass/Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/20	20/N/A
Left Eye	20/20	20/N/A
	(Pass)/Fail	Pass/Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers Ltrs 14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Dale Murdock	Level II	3/4/93
Examined by	Title	Date

==========

* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 (203) 796-6000

File: Scott Larson

CERTIFICATE OF QUALIFICATION

VISUAL EXAMINATION

LEVEL III

Scott Larson is qualified as Level III in Visual Examination in accordance with the requirements of Nuclear Energy Services' Procedure No. 80A9069, Revision 14: ISI Certification of Visual Examination Personnel. The written and practical examinations necessary for this certification were administered and graded by the EPRI NDE Center. The exam scores are based on EPRI's grading criteria. All examinations administered by EPRI are maintained by the EPRI NDE Center in Charlotte, North Carolina. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: None - VT-1, 2, 3, & 4

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

		Date Completed:
High School Graduate	First Colonial High Sch. Virginia Beach, Virginia	06-07-67

COLLEGE OR TECHNICAL

		Date Completed:
Nondestructive Testing	Spartan School of Aeronautics Tulsa, Oklahoma	10-24-80

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
EPRI NDE Center	Charlotte, North Carolina	Level II	10-24-86	40.00
Nuclear Energy Services	Danbury, Connecticut	Level II Refresher	08-15-90	1.00
EPRI NDE Center	Charlotte, North Carolina	Level III	07-30-93	40.00
			Total:	81.00

NES EXPERIENCE

VISUAL EXAMINATION ASSIGNMENTS (List up to 12 VT assignments.)	EXPERIENCE AT EACH LEVEL OF VT CERTIFICATION From	To	Level	Type	Months
PSI: Shearon Harris	02-13-84	06-11-86	Trainee	Nuclear	3.42
Various	03-04-87	12-01-89	II	Nuclear	32.95
	12-01-89	12-01-92	II	Nuclear	36.00
	08-13-93	present	III	Nuclear	
				Total:	72.37

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	VT EXPERIENCE Level	Type	Months
					Total:	N/A

TOTAL EXPERIENCE: VT LEVEL II OR III EXPERIENCE: 5.75 years VT LEVEL II OR III NUCLEAR EXPERIENCE: 5.75 years

CERTIFICATION EXAMINATIONS

Basic (General) Exam	80.00	(1/3)	Exams administered:
Specific Exam	81.50	(1/3)	07-01-92
Method (Prac.) Exam	91.50	(1/3)	Exams completed:
Composite Score	84.33		08-03-93

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A
Initial Level III certification issued by NES: 08-16-93

CERTIFIED BY W. J. Hanson

~~LEVEL III~~ President

DATE OF CERTIFICATION 08-16-93
DATE OF EXPIRATION 07-01-97

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203/796-5000

File: Scott Larson

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL III

Scott Larson is qualified as Level III in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 10, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate First Colonial High Sch. Virginia Beach, Virginia		Date Completed: 06-07-67

COLLEGE OR TECHNICAL

Nondestructive Testing Spartan School of Aeronautics Tulsa, Oklahoma		Date Completed: 10-24-80

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	10-24-80	45.00

Total: 45.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)	EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
PSI/ISI: Various	01-12-81	05-11-93	II E	Nuclear	105.00
ISI: Various	05-17-84	08-13-84	Trainee	Nuclear	1.13
	08-14-84	02-16-85	I	Nuclear	2.00
	02-16-85	03-02-87	II	Nuclear	4.50
	03-02-87	02-16-88	II	N/A	0.00
	04-15-88	04-12-91	II	Nuclear	3.60

E = Equivalent to Level II
See NES EXPERIENCE RECORD for additional NES PT certification dates.

Total: 138.23

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months

Total: N/A

TOTAL EXPERIENCE

PT LEVEL II OR III EXPERIENCE: 9.43 years

PT LEVEL II OR III NUCLEAR EXPERIENCE: 9.43 years

CERTIFICATION EXAMINATIONS

Basic Examination	80.00	(.25)	Exams administered: 11-01-92
General Examination	95.40	(.25)	
Specific Examination	95.00	(.25)	Exams completed: 05-06-93
Practical Examination	100.00	(.25)	
Composite Score	92.60		

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A
Inital Level III certification issued by NES: 05-11-93

CERTIFIED BY

W J Harrison 5/11/93

LEVEL III PRESIDENT

DATE OF CERTIFICATION 05-11-93
DATE OF EXPIRATION 11-01-97

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 (203) 796-5000

File: Scott Larson

CERTIFICATE OF QUALIFICATION

MAGNETIC PARTICLE EXAMINATION

LEVEL III

Scott Larson is qualified as Level III in Magnetic Particle Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personne, No. 80A9068, Revision 10, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate First Colonial High Sch. Virginia Beach, Virginia		Date Completed: 06-07-67

COLLEGE OR TECHNICAL

Nondestructive Testing Spartan School of Aeronautics Tulsa, Oklahoma		Date Completed: 10-24-80

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	10-24-80	45.00

Total: 45.00

NES EXPERIENCE

MAGNETIC PARTICLE EXAMINATION ASSIGNMENTS (List up to 12 MT assignments.)	EXPERIENCE AT EACH LEVEL OF MT CERTIFICATION From	To	Level		Type	Months
PSI/ISI: Various	01-12-81	05-11-93	II	E	Nuclear	105.00
ISI: Various	06-15-84	07-20-88	Trainee		Nuclear	1.00
ISI: Various	11-14-88	04-12-91	I		Nuclear	3.00
ISI: Various	07-26-91	05-11-93	II		Nuclear	22.00
ISI: Various	05-11-93	present	III		Nuclear	

E = Equivalent to Level II

Total: 131.00

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	MT EXPERIENCE Level	Type	Months
Clark Inspection Company	Tulsa, Oklahoma	08-07-80	08-25-80	Trainee	Non-nuclear	0.69

Total: 0.69

TOTAL EXPERIENCE

MT LEVEL II OR III EXPERIENCE: 10.58 years

MT LEVEL II OR III NUCLEAR EXPERIENCE: 10.58 years

CERTIFICATION EXAMINATIONS

Basic Examination	80.00	(.25)	Exams administered:
General Examination	86.20	(.25)	11-01-92
Specific Examination	92.50	(.25)	Exams completed:
Practical Examination	100.00	(.25)	05-06-93
Composite Score	89.68		

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A

Inital Level III certification issued by NES: 05-11-93

CERTIFIED BY

W J Manion 5/11/93

~~LEVEL III~~ PRESIDENT

DATE OF CERTIFICATION 05-11-93

DATE OF EXPIRATION 11-01-97

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Scott Larson

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL III

Scott Larson is qualified as Level III in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 10, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate First Colonial High Sch. Virginia Beach, Virginia		Date Completed: 06-07-67

COLLEGE OR TECHNICAL

Nondestructive Testing Spartan School of Aeronautics Tulsa, Oklahoma		Date Completed: 10-24-80

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	10-24-80	120.00
Krautkramer Branson, Inc.	Stratford, Connecticut	Level II	04-06-82	40.00
EPRI NDE Center	Charlotte, North Carolina	IGSCC Detection	01-20-84	40.00
EPRI NDE Center	Charlotte, North Carolina	Weld Overlay	09-25-85	24.00
EPRI NDE Center	Charlotte, North Carolina	IGSCC Detection	02-14-86	40.00
EPRI NDE Center	Charlotte, North Carolina	IGSCC Sizing	10-03-86	40.00
			Total:	487.50

See EDUCATION AND TRAINING RECORD for additional UT training entries.

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)		EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
PSI: Wash. Public Power	PSI: Palo Verde Unit 3	01-12-81	04-12-81	Trainee	Nuclear	3.00
PSI: San Onofre Unit 3	PSI: Shoreham	04-12-81	04-08-82	I	Nuclear	11.00
PSI: Shearon Harris	PSI: Wolf Creek	04-08-82	04-04-85	II	Nuclear	35.85
PSI: Callaway	PSI: Seabrook	04-04-85	03-02-87	II	Nuclear	17.00
PSI: St. Lucie Unit 2	PSI: Susquehanna Unit 1	03-02-87	04-03-88	II	Nuclear	13.00
ISI: Susquehanna Unit 1	ISI: Oconee Unit 2	04-14-88	04-14-91	III	Nuclear	36.00
					Total:	140.85

See NES EXPERIENCE RECORD for additional NES UT certification dates.

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
					Total:	N/A

TOTAL EXPERIENCE

UT LEVEL II OR III EXPERIENCE: 8.49 years

UT LEVEL II OR III NUCLEAR EXPERIENCE: 8.49 years

CERTIFICATION EXAMINATIONS

Basic Examination	80.00	(.25)	Exams administered:
General Examination	80.00	(.25)	07-01-92
Specific Examination	84.00	(.25)	Exams completed:
Practical Examination	99.00	(.25)	05-04-93
Composite Score	85.75		

INITIAL CERTIFICATION DATES

Prior employment initial Level III certification: N/A

Initial Level III certification issued by NES: 04-14-88

CERTIFIED BY

W J Marcum 5/11/93

~~LEVEL III~~ PRESIDENT

DATE OF CERTIFICATION 05-11-93

DATE OF EXPIRATION 07-01-97

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

QA/QC SPECIALIST CERTIFICATION

NAME: Scott Larson S.S. NO.:223-72-4324

CERTIFICATION DISCIPLINE: Mechanical Level: II

RESTRICTIONS (IF ANY): None

CERTIFICATION DATE: 12-17-90 EXPIRATION DATE: 12-14-93

BASIS FOR QUALIFICATION
NES PROCEDURE 80A9037

EDUCATION: First Colonial High Sch.
Virginia Beach, Virginia
06-07-67

	EMPLOYER	TYPE	MONTHS
EXPERIENCE:			
NES Experience:	Various	Nuclear	36.37

Total Months of Experience: 36.37

	School	Type of Training
TRAINING:	EPRI NDE Center	Visual Level II
	Nuclear Energy Services	Visual Level II

EXAMINATION: General: 88.90% Specific: 100.00% Practical: N/A%

VISUAL ACUITY:

Completed by: Dale Murdock Date: 04-07-90 Results: Passed
Completed by: Art Pennanen Date: 03-26-91 Results: Passed
Completed by: Ben Ashby Date: 02-13-92 Results: Passed

L-III 12-17-90
Examiner Signature/Date

Ben G. Ashby/QA Manager
Examiner Name/Title
(Printed or typed)

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

QA/QC SPECIALIST CERTIFICATION

NAME: Scott Larson S.S. NO.: 223-72-4324

CERTIFICATION DISCIPLINE: Piping/Welding LEVEL: II

RESTRICTIONS (IF ANY): None

CERTIFICATION DATE: 12-17-90 EXPIRATION DATE: 12-14-93

BASIS FOR QUALIFICATION
NES PROCEDURE 80A9037

EDUCATION:

First Colonial High Sch. Virginia Beach, Virginia 06-07-67		Spartan School of Aeronaut Tulsa, Oklahoma 10-24-80 Nondestructive Testing

EXPERIENCE:

Employer	Type	Months
NES Experience: Various	Nuclear	36.37

Total Months of Experience: 36.37

TRAINING:

School	Type of Training
EPRI NDE Center	Visual Level II
Nuclear Energy Services	Visual Level II

EXAMINATION: General: 88.90% Specific: 93.75% Practical: N/A

VISUAL ACUITY:

Completed by: Dale Murdock Date: 04-07-90 Results: Passed
Completed by: Art Pennanen Date: 03-26-91 Results: Passed
Completed by: Ben Ashby Date: 02-13-92 Results: Passed

L-III 12-17-90
Examiner Signature/Date

Ben G. Ashby/QA Manager
Examiner Name/Title
(Printed or Typed)

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Scott Larson

High School Graduate First Colonial High Sch. Virginia Beach, Virginia	Date Completed: 06-07-67	Nondestructive Testing Spartan School of Aeronautics Tulsa, Oklahoma	Date Completed: 10-24-80	DATE OF EYE EXAM: 03-04-93 CORRECTIVE LENSES REQUIRED: Near: No Far: No EYE EXAM DUE: 03-04-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	45.00	Ultrasonics:	487.50	IGSCC Sizing:	72.00
Penetrant:	45.00	Visual:	81.00	Weld Overlay:	24.00
Radiography:	150.00	IGSCC Detection:	120.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	131.00	0.69	131.69	Unrestricted
Penetrant:	138.23	0.00	138.23	Unrestricted
Radiography:	0.00	0.00	0.00	
Ultrasonics:	140.85	0.00	140.85	Unrestricted
Visual:	72.37	0.00	72.37	None - VT-1,2,3,4

	DATE OF CURRENT CERTIFICATION				DATE OF EXPIRATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle		11-14-88	07-26-91	05-11-93				11-01-97
Penetrant			07-26-91	05-11-93				11-01-97
Radiography								
Ultrasonics				05-11-93				07-01-97
Visual			08-23-90	08-16-93				07-01-97

IGSCC Detection (Manual) 01-16-92

IGSCC Sizing (Manual) 06-09-92

Weld Overlay (Manual) 09-25-88

Nozzle Inner Radius Qualification

	PREVIOUS EMPLOYMENT INITIAL CERTIFICATION				DATE OF INITIAL NES CERTIFICATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle					06-15-84	11-14-88	07-26-91	05-11-93
Penetrant					05-17-84	08-14-84	07-26-91	05-11-93
Radiography								
Ultrasonics					01-12-81	04-12-81	04-08-82	04-14-88
Visual					02-13-84		03-04-87	08-16-93

IGSCC Detection 04-30-84

IGSCC Sizing 03-02-87

Weld Overlay 03-03-87

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

EDUCATION AND TRAINING RECORD

NAME: Scott Larson

Nondestructive Examination

EDUCATION

High School Graduate	Date	Nondestructive Testing	Date	Education credited
First Colonial High Sch.	Completed:	Spartan School of Aeronautics	Completed:	toward NDE
Virginia Beach, Virginia	06-07-67	Tulsa, Oklahoma	10-24-80	certifications: 12 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	N/A	10-24-80	45.00
				Total this page:		45.00
				TOTAL:		45.00
PT	Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	N/A	10-24-80	45.00
				Total this page:		45.00
				TOTAL:		45.00
RT	Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	N/A	10-24-80	120.00
	Spartan School of Aero.	Tulsa, Oklahoma	Radiation Safety	N/A	10-24-80	30.00
				Total this page:		150.00
				TOTAL:		150.00
UT	Spartan School of Aero.	Tulsa, Oklahoma	Level I and II	N/A	10-24-80	120.00
	Krautkramer Branson, Inc.	Stratford, Connecticut	Level II	N/A	04-06-82	40.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Detection	EPRI Mod. 17 Rev. 0	01-20-84	40.00
	EPRI NDE Center	Charlotte, North Carolina	Weld Overlay	N/A	09-25-85	24.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Detection	N/A	02-14-86	40.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Sizing	EPRI Mod. 17 Rev. 0	10-03-86	40.00
	See next page for additional UT entries.			Total this page:		304.00
				TOTAL:		487.50
	IGSCC Detection Hrs: 120.00	IGSCC Sizing Hrs: 72.00	Weld Overlay Hrs: 24.00	Nozzle Inner Radius Hrs:		0.00
VT	EPRI NDE Center	Charlotte, North Carolina	Level II	N/A	10-24-86	40.00
	Nuclear Energy Services	Danbury, Connecticut	Level II Refresher	N/A	08-15-90	1.00
	EPRI NDE Center	Charlotte, North Carolina	Level III	N/A	07-30-93	40.00
				Total this page:		81.00
				TOTAL:		81.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

EDUCATION AND TRAINING RECORD

NAME: Scott Larson

Nondestructive Examination

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT						
PT						
RT						
UT	Nuclear Energy Services	Danbury, Connecticut	Level I Automated	N/A	09-25-81	123.00
	Nuclear Energy Services	Danbury, Connecticut	Callaway CD Exam	80A4576 and 80A4590	09-26-83	2.45
	Nuclear Energy Services	Danbury, Connecticut	UT Exam Technique	NES 80A4576	09-28-83	5.00
	Nuclear Energy Services	Danbury, Connecticut	Documenting Waveform	NES 80A5532	09-28-83	0.50
	Nuclear Energy Services	Danbury, Connecticut	Procedure Review	80A4870 and 80A4885	11-04-83	1.00
	Nuclear Energy Services	Danbury, Connecticut	Auto. Vessel Scanner	N/A	06-25-81	4.00
					Total this page:	135.95
VT						

IGSCC Detection Hrs: 0.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Allen
Technical Director's Designee

8-16-93
Date

EDUCATION AND TRAINING RECORD

NAME: Scott Larson

Nondestructive Examination

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT						
PT						
RT						
UT	NES/Dynacon	Concord, California	UT, UDRPS	920 SG System Manual	05-15-87	40.00
	Nuclear Energy Services	Danbury, Connecticut	Initial Level III	N/A	04-14-88	2.00
	Nuclear Energy Services	Shearon Harris Unit 1	Procedure Review	NES 83A0289	07-20-88	2.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Detection	N/A	01-18-89	40.00
	Nuclear Energy Services	Danbury, Connecticut	RC Pump Flywheel	NES 83A1015 Rev. 2	03-21-89	2.00
	EPRI NDE Center	Charlotte, North Carolina	IGSCC Sizing	N/A	06-09-89	32.00
VT						

Total this page: 118.00

IGSCC Detection Hrs: 40.00 IGSCC Sizing Hrs: 32.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Allwin
Technical Director's Designee

8-16-93
Date

nes — NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: Scott Larson

	NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION				
		FROM	TO	LEVEL	TYPE	MONTHS
MT	PSI/ISI: Various	01-12-81	05-11-93	II	Nuclear	105.00
	ISI: Various	06-15-84	07-20-88	Trainee	Nuclear	1.00
	ISI: Various	11-14-88	04-12-91	I	Nuclear	3.00
	ISI: Various	07-26-91	05-11-93	II	Nuclear	22.00
	ISI: Various	05-11-93	present	III	Nuclear	
					Total this page:	131.00
					TOTAL:	131.00
PT	PSI/ISI: Various	01-12-81	05-11-93	II	Nuclear	105.00
	ISI: Various	05-17-84	08-13-84	Trainee	Nuclear	1.13
		08-14-84	02-16-85	I	Nuclear	2.00
		02-16-85	03-02-87	II	Nuclear	4.50
		03-02-87	02-16-88	II	N/A	0.00
		04-15-88	04-12-91	II	Nuclear	3.60
					Total this page:	116.23
	See next page for additional PT entries.				TOTAL:	138.23
RT						
					TOTAL:	0.00
UT	PSI: Wash. Public Power / PSI: Palo Verde Unit 3	01-12-81	04-12-81	Trainee	Nuclear	3.00
	PSI: San Onofre Unit 3 / PSI: Shoreham	04-12-81	04-08-82	I	Nuclear	11.00
	PSI: Shearon Harris / PSI: Wolf Creek	04-08-82	04-04-85	II	Nuclear	35.85
	PSI: Callaway / PSI: Seabrook	04-04-85	03-02-87	II	Nuclear	17.00
	PSI: St. Lucie Unit 2 / PSI: Susquehanna Unit 1	03-02-87	04-03-88	II	Nuclear	13.00
	ISI: Susquehanna Unit 1 / ISI: Oconee Unit 2	04-14-88	04-14-91	III	Nuclear	36.00
					Total this page:	115.85
	See next page for additional UT entries.				TOTAL:	140.85
VT	PSI: Shearon Harris	02-13-84	06-11-86	Trainee	Nuclear	3.42
	Various	03-04-87	12-01-89	II	Nuclear	32.95
		12-01-89	12-01-92	II	Nuclear	36.00
		08-13-93	present	III	Nuclear	
					Total this page:	72.37
					TOTAL:	72.37

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY CONNECTICUT 06810, 203) 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: Scott Larson

	NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT						
PT	ISI: Various	07-26-91	05-11-93	II	Nuclear	22.00
	ISI: Various	05-11-93	present	III	Nuclear	
					Total this page:	22.00
RT						
UT	ISI: Various	04-14-91	05-11-93	III	Nuclear	25.00
	ISI: Various	05-11-93	present	III	Nuclear	
					Total this page:	25.00
VT						

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Scott Larson

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT	Clark Inspection Company	Tulsa, Oklahoma	Non-nuclear	08-07-80	08-25-80	0.69	Trainee

Total this page: 0.69

TOTAL: 0.69

PT

TOTAL: 0.00

RT

TOTAL: 0.00

UT

TOTAL: 0.00

VT

TOTAL: 0.00

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

Resume for
GERALD SCOTT LARSON

EXPERIENCE SUMMARY

Employed for more than eleven years with Nuclear Energy Services. Experience includes reactor vessel exams, preservice examinations of balance-of-plant piping and components, automated examinations and manual ISI/PSI inspection assignments. Presently assigned to the Southern Regional Office as a Project Engineer/UT Level III. Responsible for updating all generic procedures to the latest code addenda, ensuring that procedures and equipment are ready for field deployment and certification of NDE technicians.

NES SOUTHERN REGIONAL OFFICE — Project Engineer/ UT Level III — 01/81 to Present
Cary, North Carolina

Responsible for site supervision, maintaining NDE procedures, certification of personnel and providing field support for various inspection projects.

Assignments:

03/91 to 05/91 Shearon Harris - ISI - Responsible for all NES on-site NDE activities. Performed UT, PT and MT examinations. Reviewed all NES data.

09/90 to 10/90 Callaway - ISI Site Supervisor - Supervised NES NDE personnel in performing ASME Section XI examinations. Performed UT, MT and PT examinations. Reviewed all NES data.

03/90 to 04/90 Wolf Creek- ISI - Site Supervisor - Responsible for all NES on-site activities during Spring 1990 outage.

10/89 to 12/89 Shearon Harris - ISI - Responsible for all NES on-site NDE activities. Performed UT, PT and MT examinations. Reviewed all NES data.

03/89 to 04/89 Callaway - ISI Site Supervisor - Supervised NES NDE personnel in performing ASME Section XI examinations. Performed UT, MT and PT examinations. Reviewed all NES data.

01/89 to 02/89 Hoechst-Celanese, Pampa, Texas - IGSCC UT examination of piping and vessels. Performed UT, PT and VT examinations.

11/88 H.B. Robinson - NDE Level III. Assisted CP&L in Erosion Corrosion Program. Performed UT, PT and VT examinations.

05/88 to 09/88 Shearon Harris - ISI Project Engineer - Responsible for all NES on-site NDE activities. Performed UT, PT and MT examinations per ASME Section XI. Performed VT exams on studs, nuts, valve bolting and Reactor Vessel internals. Reviewed all NES data.

11/87 to 05/88 Oyster Creek - NDE Engineer - Assisted the Special Programs and Processes Department in developing ultrasonic techniques for corrosion resistant clad overlay safe end welds using a variety of ultrasonic sizing techniques. Duties also included calibration block and mock-up design, vendor surveillance, procedure development and writing the final report.

10/87 Wolf Creek - Lead Level II - Inservice inspection. Performed Level II ultrasonic examinations of balance-of-plant piping and components.

07/87 to 10/87 Callaway - UDRPS Analyst - Inservice inspection. Assisted the Automated Department in the preparation and performance of ultrasonic examinations of the reactor vessel nozzles. Responsibilities included procedure and scan plan preparation, system calibration and performance of examinations.

04/87 to 05/87 Point Beach Unit 1 - UDRPS Operator - Inservice inspection. Assisted utility personnel with the operation of UDRPS during examinations of the reactor vessel.

04/87 Calvert Cliffs Unit 2 - UDRPS Operator - Inservice inspection. Assisted BG&E personnel with the operation of UDRPS during the 10-year examination of the reactor vessel.

EXPERIENCE (Continued)

09/86 Oconee 2 - NDE Examiner - Inservice inspection. Responsible for the preparation of procedures and the UDRPS examination of the Core Flood Tank.

02/84 to 07/86 Shearon Harris - Project Engineer - Functioned as NDE examiner until 4/84. Promoted to Site Supervisor 4/84 to 5/85. Advanced to Project Engineer 5/85. This was a full scope PSI operation. Responsible for performing UT, PT, MT and VT examinations. Responsibilities of Site Supervisor included scheduling work assignments and customer interface. Responsibility of Project Engineer was to oversee all project related activities, review procedures and resolve NDE related problems.

04/84 Seabrook Unit 1 - NDE Examiner - Preservice inspection. Performed Level II ultrasonic examinations of the reactor pressure vessel.

01/81 to 12/83 NES Home Office - NDE Examiner - Assigned to the Automated Inservice Inspection Group as a UT trainee. Qualified for Level II certification in ultrasonics on 04/08/82. Duties included preparation of scan plans and examination procedures, training ultrasonic examiners and developing new ultrasonic examination techniques. Completed the following assignments while in the Automated ISI Group:

Preservice Reactor Vessel Examinations:

03/81	WNP-3	NDE Examiner	Washington Public Power Supply
08/81	Palo Verde 3	NDE Examiner	Arizona Public Service
10/81	San Onofre 3	NDE Examiner	Southern California Edison
12/81 to 04/82	Shoreham	NDE Examiner	Long Island Lighting Company
08/83	Shearon Harris	Shift Supervisor	Carolina Power & Light
08/83	Wolf Creek	Shift Supervisor	Kansas Gas & Electric
11/83	Callaway	Shift Supervisor	Union Electric

Preservice and Inservice Examinations:

02/82 to 09/82 Susquehanna - NDE Examiner - Preservice inspection. Performed Level II UT piping examinations of recirculation lines using NES Procedure 80A2787.

03/82 St. Lucie 2 - NDE Examiner - Preservice inspection. Performed Level I UT balance-of-plant examinations.

04/83 Susquehanna - NDE Examiner - Inservice inspection. Performed automated UT examinations of recirculation lines, including safe end and sweepolet welds.

CERTIFICATIONS

Ultrasonics	Level III	Visual Examination (EPRI)	Level II
Ultrasonic IGSCC Detection (EPRI)	Level II	Liquid Penetrant	Level II
Ultrasonic IGSCC Flaw Sizing (EPRI)	Level II	Magnetic Particle	Level II
Visual Weld Inspection	Level II		

NDE TRAINING

480 hours	All NDE methods	Spartan School of Aeronautics	Tulsa, Oklahoma
40 hours	UT Level II	Krautkramer-Branson	Stratford, Connecticut
20 hours	UT - NES Proc. 80A2787	Nuclear Energy Services	Danbury, Connecticut
40 hours	UT-IGSCC Detection	EPRI NDE Center	Charlotte, North Carolina
24 hours	UT-Weld Overlay	EPRI NDE Center	Charlotte, North Carolina
40 hours	UT-IGSCC Detection	EPRI NDE Center	Charlotte, North Carolina
40 hours	Visual Exam.	EPRI NDE Center	Charlotte, North Carolina
40 hours	UT-UDRPS 920 SG System	NES/Dynacon	Concord, California

EDUCATION

1967 First Colonial High School Graduate, Virginia Beach, Virginia
1968 University of South Carolina, Columbia, South Carolina
1969 Old Dominion University, Norfolk, Virginia

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

VISION ACUITY EXAMINATION REPORT

Name: David Martin SSN: 535-68-1227 Date: 8-12-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J 1	J
Left Eye	J 1	J
	(Pass)/Fail	Pass/Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/20	20/
Left Eye	20/20	20/
	(Pass)/Fail	Pass/Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Scott Larson — Examined by | L III — Title | 8-12-93 — Date

* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 [illegible]

File: David G. Martin

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL II

David G. Martin is qualified as Level II in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: None

SEE ATTACHED VISION ACUITY REPORT

EDUCATION: High School Graduate, Mark Morris High School, Longview, Washington — Date Completed: 06-01-74

COLLEGE OR TECHNICAL: N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Krautkramer Branson	Lewistown, Pennsylvania	Level I	07-27-90	40.00
Krautkramer Branson	Lewistown, Pennsylvania	Level II	04-10-92	40.00
ABB Amdata, Inc.	Windsor, Connecticut	Level I and II	12-01-90	40.00
			Total:	120.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)

	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: Arkansas Nuclear One	10-04-90	11-08-90	Rel.Exp	Nuclear	2.26
ISI: Arkansas Nuclear One	02-02-91	03-09-91	Rel.Exp	Nuclear	1.03
			II	Nuclear	
				Total:	3.29

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
* Lambert,McGill & Thomas	Santa Clara, California	08-27-89	03-14-92	Trainee	Nuclear	2.98
* Lambert,McGill & Thomas	Santa Clara, California	08-27-89	03-14-92	I	Nuclear	2.77
General Electric	Norcross, Georgia	09-07-92	10-17-92	II	Nuclear	1.10
* ABB Amdata, Inc.	Windsor, Connecticut	02-04-91	07-01-93	II	Nuclear	6.80
					Total:	13.65

* Denotes non-continuous experience.

TOTAL EXPERIENCE: 16.94 months of experience in ultrasonic examination

CERTIFICATION EXAMINATIONS

General Examination	92.50	(.3)	Exams administered:
Specific Examination	85.00	(.2)	08-12-93
Practical Examination	95.00	(.5)	Exams completed:
Composite Score	92.25		08-12-93

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 07-22-92
Initial Level II certification issued by NES: 08-16-93

CERTIFIED BY

Scott Lawson 8-16-93

LEVEL III

DATE OF CERTIFICATION: 08-16-93
DATE OF EXPIRATION: 08-12-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

File: David G. Martin

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL II

David G. Martin is qualified as Level II in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 10, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS	Color Contrast Only	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Mark Morris High School Longview, Washington	Date Completed: 06-01-74	COLLEGE OR TECHNICAL	N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
ABB Amdata, Inc.	Windsor, Connecticut	Level I and II	12-01-90	12.00
			Total:	12.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)	EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
			II	Nuclear	
				Total:	N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
* Lambert,McGill & Thomas	Santa Clara, California	08-27-89	03-14-92	Trainee	Nuclear	0.73
* Lambert,McGill & Thomas	Santa Clara, California	08-27-89	10-27-92	I	Nuclear	0.71
General Electric	Norcross, Georgia	09-07-92	10-17-92	I	Nuclear	0.03
* ABB Amdata, Inc.	Windsor, Connecticut	02-04-91	07-01-93	II	Nuclear	6.80
				Total:		8.27

* Denotes non-continuous experience.

TOTAL EXPERIENCE 8.27 months of experience in penetrant examination

CERTIFICATION EXAMINATIONS

General Examination	96.66	(.3)	Exams administered:
Specific Examination	90.00	(.2)	08-12-93
Practical Examination	91.00	(.5)	Exams completed:
Composite Score	92.50		08-12-93

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 07-22-92
Initial Level II certification issued by NES: 08-16-93

CERTIFIED BY

Scott Larson 8/16-93

LEVEL III

DATE OF CERTIFICATION 08-16-93
DATE OF EXPIRATION 08-12-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NES, Inc. SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: David G. Martin

High School Graduate
Mark Morris High School
Longview, Washington

Date Completed: 06-01-74

DATE OF EYE EXAM: 08-12-93
CORRECTIVE LENSES REQUIRED:
Near: No Far: No
EYE EXAM DUE: 08-12-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	0.00	Ultrasonics:	120.00	IGSCC Sizing:	0.00
Penetrant:	12.00	Visual:	0.00	Weld Overlay:	0.00
Radiography:	0.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	0.00	0.00	0.00	
Penetrant:	0.00	8.27	8.27	Color Contrast Only
Radiography:	0.00	0.00	0.00	
Ultrasonics:	3.29	13.65	16.94	None
Visual:	0.00	0.00	0.00	

	DATE OF CURRENT CERTIFICATION				DATE OF EXPIRATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle								
Penetrant			08-16-93				08-12-96	
Radiography								
Ultrasonics			08-16-93				08-12-96	
Visual								

IGSCC Detection (Manual) _____ _____

IGSCC Sizing (Manual) _____ _____

Weld Overlay (Manual) _____ _____

Nozzle Inner Radius Qualification _____

	PREVIOUS EMPLOYMENT INITIAL CERTIFICATION				DATE OF INITIAL NES CERTIFICATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle								
Penetrant			07-22-92				08-16-93	
Radiography								
Ultrasonics			07-22-92				08-16-93	
Visual								

IGSCC Detection _____ _____

IGSCC Sizing _____ _____

Weld Overlay _____ _____

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 203 796-5000

EDUCATION AND TRAINING RECORD

NAME: David G. Martin

Nondestructive Examination

EDUCATION

High School Graduate
Mark Morris High School
Longview, Washington

Date Completed: 06-01-74

Education credited toward NDE certifications: 12 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT						
					TOTAL:	0.00
PT	ABB Amdata, Inc.	Windsor, Connecticut	Level I and II	N/A	12-01-90	12.00
					Total this page:	12.00
					TOTAL:	12.00
RT						
					TOTAL:	0.00
UT	Krautkramer Branson	Lewistown, Pennsylvania	Level I	N/A	07-27-90	40.00
	Krautkramer Branson	Lewistown, Pennsylvania	Level II	N/A	04-10-92	40.00
	ABB Amdata, Inc.	Windsor, Connecticut	Level I and II	N/A	12-01-90	40.00
					Total this page:	120.00
					TOTAL:	120.00

IGSCC Detection Hrs: 0.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

VT

TOTAL: 0.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY CONNECTICUT 06810 203-796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: David G. Martin

NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.		EXPERIENCE AT EACH LEVEL OF CERTIFICATION				
		FROM	TO	LEVEL	TYPE	MONTHS
MT						
					TOTAL:	0.00
PT				II	Nuclear	
					TOTAL:	0.00
RT						
					TOTAL:	0.00
UT	ISI: Arkansas Nuclear One	10-04-90	11-08-90	Rel.Exp	Nuclear	2.26
	ISI: Arkansas Nuclear One	02-02-91	03-09-91	Rel.Exp	Nuclear	1.03
				II	Nuclear	
					Total this page:	3.29
					TOTAL:	3.29
VT						
					TOTAL:	0.00

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

8-16-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY CONNECTICUT 06810 203-796-5000

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: David G. Martin

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT							
					TOTAL:	0.00	
PT	* Lambert,McGill & Thomas	Santa Clara, California	Nuclear	08-27-89	03-14-92	0.73	Trainee
	* Lambert,McGill & Thomas	Santa Clara, California	Nuclear	08-27-89	10-27-92	0.71	I
	General Electric	Norcross, Georgia	Nuclear	09-07-92	10-17-92	0.03	I
	* ABB Amdata, Inc.	Windsor, Connecticut	Nuclear	02-04-91	07-01-93	6.80	II
					Total this page:	8.27	
					TOTAL:	8.27	
RT							
					TOTAL:	0.00	
UT	* Lambert,McGill & Thomas	Santa Clara, California	Nuclear	08-27-89	03-14-92	2.98	Trainee
	* Lambert,McGill & Thomas	Santa Clara, California	Nuclear	08-27-89	03-14-92	2.77	I
	General Electric	Norcross, Georgia	Nuclear	09-07-92	10-17-92	1.10	II
	* ABB Amdata, Inc.	Windsor, Connecticut	Nuclear	02-04-91	07-01-93	6.80	II
					Total this page:	13.65	
					TOTAL:	13.65	
VT							
					TOTAL:	0.00	

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary Ellen Alling
Technical Director's Designee

8-16-93
Date

RESUME FOR
DAVID G. MARTIN

EDUCATION

4/92	Krautkramer Branson, Lewistown, Pennsylvania - Level II Ultrasonic Testing (40 hours)
12/90	ABB Amdata, Windsor, Connecticut - Liquid Penetrant Testing (12 hours)
7/90	Krautkramer Branson, Lewistown, Pennsylvania - Level I Ultrasonic Testing (40 hours)
6/89	Portland General Electric Company, Portland, Oregon - General Ultrasonic Testing Concepts
8/84 to 8/86	Piedmont Technical College, Greenwood, South Carolina - Industrial Technology (100 credit hours). Member Athenian Honor Society. Listed in National Deans List, 1984-85and 1985-86.

EXPERIENCE

12/92 to 07/93 — ABB AMDATA
Watts Barr, Browns Ferry

Watts Bar - Preservice and Erosion/Corrosion Inspection. Browns Ferry - Inservice Inspection.

09/92 to 10/92 — GENERAL ELECTRIC NUCLEAR ENERGY
Susquehanna Steam Electric Plant

Inservice Inspection.

02/92 to 03/92 — LAMBERT, MacGILL, THOMAS, INC.
Prairie Island Nuclear Plant/Red Wing Steam Plant

Inservice and erosion/corrosion inspections.

11/91 to 12/91 — ABB AMDATA
Millstone Nuclear Power Plant

Erosion/corrosion inspections.

09/91 to 11/91 — LAMBERT, MacGILL, THOMAS, INC.
Hatch and Vogtle Nuclear Power Plants

Inservice Inspection.

04/91 to 05/91 — NES, Inc.
Arkansas Nuclear One

Erosion/corrosion inspection.

02/91 — ABB AMDATA
Millstone Nuclear Power Plant

Inservice Inspection.

10/90 to 11/90 — NES, Inc.
Arkansas Nuclear One

Erosion/corrosion inspection.

EXPERIENCE (Continued)

03/90 to 05/90	VOLT TECHNICAL SERVICES Trojan Nuclear Power Plant Erosion/corrosion inspection.
01/90 to 02/90	LAMBERT, MacGILL, THOMAS, INC. Quad Cities Nuclear Station Inservice Inspection.
08/89 to 10/89	LAMBERT, MacGILL, THOMAS, INC. Quad Cities Nuclear Station Inservice Inspection.
03/89 to 07/89	PORTLAND GENERAL ELECTRIC COMPANY Trojan Nuclear Power Plant Erosion/corrosion inspection.

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

VISION ACUITY EXAMINATION REPORT

Name: Kenneth Nance SSN: 303-64-7110 Date: 9-3-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J 1	~~J~~ N
Left Eye	J 1	J
	(Pass)/Fail	Pass/~~Fail~~

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/20	~~20/N~~ J
Left Eye	20/20	20/
	(Pass)/Fail	Pass/~~Fail~~

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's ~~test~~ plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Examined by	Title	Date
Scott Larson	LTH	9-3-93

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* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

File: Kenneth R. Nance

CERTIFICATE OF QUALIFICATION

VISUAL EXAMINATION

LEVEL II

Kenneth R. Nance is qualified as Level II in Visual Examination in accordance with the requirements of Nuclear Energy Services' Procedure No. 80A9069, Revision 14: Certification of Visual Examination Personnel. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 81A4376, Revision 1.

CERTIFICATION RESTRICTIONS	VT-1,3,4 Only	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate West Side High School Gary, Indiana	Date Completed: 06-01-73	COLLEGE OR TECHNICAL	N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I and II	01-01-86	28.00
PSESI	Windsor, Connecticut	Level I and II	04-09-92	8.00
			Total:	36.00

NES EXPERIENCE

VISUAL EXAMINATION ASSIGNMENTS (List up to 12 VT assignments.)	EXPERIENCE AT EACH LEVEL OF VT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II	Nuclear	
				Total:	N.A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	VT EXPERIENCE Level	Type	Months
U.S. Navy		12-28-79	12-15-83	Rel.Exp	Non-nuclear	48.00
Altantic Dry Dock Corp.	Jacksonville, Florida	07-01-87	04-01-88	II	Non-nuclear	9.00
					Total:	57.00

* Denotes non-continuous experience.

TOTAL EXPERIENCE 57.00 months of visual examination/related inspection experience.

CERTIFICATION EXAMINATIONS

General Examination	73.36	(.3)	Exams administered:
Specific Examination	77.78	(.2)	09-03-92
Practical Examination	89.00	(.5)	Exams completed:
Composite Score	82.06		09-28-92

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-29-92

CERTIFIED BY

09-29-92

LEVEL III EXAMINER

DATE OF CERTIFICATION 09-29-92
DATE OF EXPIRATION 09-03-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 (203) 796-6900

File: Kenneth R. Nance

Reissued to remove restriction. Date of certification remains at 9-1-92.

CERTIFICATE OF QUALIFICATION

MAGNETIC PARTICLE EXAMINATION

LEVEL II

Kenneth R. Nance is qualified as Level II in Magnetic Particle Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate
West Side High School
Gary, Indiana
Date Completed: 06-01-73

COLLEGE OR TECHNICAL: N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I and II	01-01-86	32.00

Total: 32.00

NES EXPERIENCE

MAGNETIC PARTICLE EXAMINATION ASSIGNMENTS (List up to 12 MT assignments.)	EXPERIENCE AT EACH LEVEL OF MT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	MT EXPERIENCE Level	Type	Months
Atlantic Dry Dock Corp.	Jacksonville, Florida	07-01-87	04-01-88	II	Non-nuclear	9.00
Western Stress, Inc.	Richmond, Virginia	10-01-89	01-01-90	II	Non-nuclear	2.00
PSESI, Inc.	Windsor, Connecticut	04-01-92	06-01-92	II	Nuclear	2.00

* Denotes non-continuous experience.

Total: 13.00

TOTAL EXPERIENCE: 13.00 months of experience in magnetic particle examination

CERTIFICATION EXAMINATIONS

General Examination	80.00	(.3)	Exams administered:
Specific Examination	80.00	(.2)	08-12-92
Practical Examination	83.00	(.5)	Exams completed:
Composite Score	81.50		08-13-92

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-01-92

CERTIFIED BY

Scott Larson 9-15-93

LEVEL III

DATE OF CERTIFICATION: 09-01-92
DATE OF EXPIRATION: 08-12-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes — NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Kenneth R. Nance

High School Graduate
West Side High School
Gary, Indiana

Date Completed: 06-01-73

DATE OF EYE EXAM: 09-03-93
CORRECTIVE LENSES REQUIRED:
Near: No Far: No
EYE EXAM DUE: 09-03-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	32.00	Ultrasonics:	8.00	IGSCC Sizing:	0.00
Penetrant:	16.00	Visual:	36.00	Weld Overlay:	0.00
Radiography:	0.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	0.00	13.00	13.00	Unrestricted
Penetrant:	0.00	13.00	13.00	Color Contrast Only
Radiography:	0.00	0.00	0.00	
Ultrasonics:	0.00	9.00	9.00	Thickness Only
Visual:	0.00	57.00	57.00	VT-1,3,4 Only

DATE OF CURRENT CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			09-01-92	
Penetrant			09-01-92	
Radiography				
Ultrasonics			09-01-92	
Visual			09-29-92	

DATE OF EXPIRATION

	Trainee	I	II	III
Magnetic Particle			08-12-95	
Penetrant			08-11-95	
Radiography				
Ultrasonics			08-11-95	
Visual			09-03-95	

IGSCC Detection (Manual) _____ _____

IGSCC Sizing (Manual) _____ _____

Weld Overlay (Manual) _____ _____

Nozzle Inner Radius Qualification _____

PREVIOUS EMPLOYMENT INITIAL CERTIFICATION

	Trainee	I	II	III
Magnetic Particle				
Penetrant				
Radiography				
Ultrasonics				
Visual				

DATE OF INITIAL NES CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			09-01-92	
Penetrant			09-01-92	
Radiography				
Ultrasonics			09-01-92	
Visual			09-29-92	

IGSCC Detection _____ _____

IGSCC Sizing _____ _____

Weld Overlay _____ _____

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Allen
Technical Director's Designee

9-14-93
Date

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Kenneth R. Nance

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL II

Kenneth R. Nance is qualified as Level II in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS	Color Contrast Only	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate West Side High School Gary, Indiana	Date Completed: 06-01-73	COLLEGE OR TECHNICAL	N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I and II	01-01-86	16.00

Total: 16.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)	EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
Altantic Dry Dock Corp.	Jacksonville, Florida	07-01-87	04-01-88	II	Non-nuclear	9.00
Western Stress, Inc.	Richmond, Virginia	10-01-89	01-01-90	II	Non-nuclear	2.00
PSESI, Inc.	Windsor, Connecticut	04-01-92	06-01-92	II	Nuclear	2.00

* Denotes non-continuous experience.

Total: 13.00

TOTAL EXPERIENCE 13.00 months of experience in penetrant examination

CERTIFICATION EXAMINATIONS

General Examination	93.33	(.3)	Exams administered:
Specific Examination	100.00	(.2)	08-11-92
Practical Examination	90.00	(.5)	Exams completed:
Composite Score	93.00		08-12-92

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-01-92

CERTIFIED BY

09-11-92

LEVEL III EXAMINER

DATE OF CERTIFICATION 09-01-92
DATE OF EXPIRATION 08-11-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NAME: Kenneth R. Nance

EDUCATION AND TRAINING RECORD

Nondestructive Examination

EDUCATION

High School Graduate
West Side High School
Gary, Indiana

Date Completed: 06-01-73

Education credited toward NDE certifications: 12 years

NDE CLASSROOM TRAINING

	INSTITUTION ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I and II	N/A	01-01-86	32.00
				Total this page:		32.00
				TOTAL:		32.00
PT	Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I and II	N/A	01-01-86	16.00
				Total this page:		16.00
				TOTAL:		16.00
RT						
				TOTAL:		0.00
UT	Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I Thickness	N/A	01-01-86	8.00
				Total this page:		8.00
				TOTAL:		8.00

IGSCC Detection Hrs: 0.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

VT	Atlantic Dry Dock Corp.	Jacksonville, Florida	Level I and II	N/A	01-01-86	28.00
	PSESI	Windsor, Connecticut	Level I and II	N/A	04-09-92	8.00
				Total this page:		36.00
				TOTAL:		36.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-29-92
Date

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

NES EXPERIENCE RECORD

Nondestructive Examination

NAME: Kenneth R. Nance

	NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT	ISI: Seabrook			II	Nuclear	
					TOTAL:	0.00
PT	ISI: Seabrook			II	Nuclear	
					TOTAL:	0.00
RT						
					TOTAL:	0.00
UT						
					TOTAL:	0.00
VT	ISI: Seabrook			II	Nuclear	
					TOTAL:	0.00

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-29-92
Date

PREVIOUS EXPERIENCE RECORD

Nondestructive Examination

NAME: Kenneth R. Nance

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT	Atlantic Dry Dock Corp.	Jacksonville, Florida	Non-nuclear	07-01-87	04-01-88	9.00	II
	Western Stress, Inc.	Richmond, Virginia	Non-nuclear	10-01-89	01-01-90	2.00	II
	PSESI, Inc.	Windsor, Connecticut	Nuclear	04-01-92	06-01-92	2.00	II
					Total this page:	13.00	
					TOTAL:	13.00	
PT	Altantic Dry Dock Corp.	Jacksonville, Florida	Non-nuclear	07-01-87	04-01-88	9.00	II
	Western Stress, Inc.	Richmond, Virginia	Non-nuclear	10-01-89	01-01-90	2.00	II
	PSESI, Inc.	Windsor, Connecticut	Nuclear	04-01-92	06-01-92	2.00	II
					Total this page:	13.00	
					TOTAL:	13.00	
RT							
					TOTAL:	0.00	
UT	Atlantic Dry Dock Corp.	Jacksonville, Florida	Non-nuclear	07-01-87	04-01-88	9.00	II
					Total this page:	9.00	
					TOTAL:	9.00	
VT	U.S. Navy		Non-nuclear	12-28-79	12-15-83	48.00	Rel.Exp
	Altantic Dry Dock Corp.	Jacksonville, Florida	Non-nuclear	07-01-87	04-01-88	9.00	II
					Total this page:	57.00	
					TOTAL:	57.00	

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-29-92
Date

Resume for
Kenneth R. Nance

EDUCATION

1973	West Side High School, Gary, Indiana
1973-1975	Purdue University, West Lafayette, Indiana
1977-1979	Indiana University NW, Gary, Indiana

SPECIAL TRAINING

1980	US Navy	Machinist Mate "A" School
1981	US Navy	Valve Repair and CRP
1980-1983	US Navy	Power Plant System (Mechanical/Dimensional) QA/QC
1982	US Navy	Power Plant Engineering Preventive Maintenance Administration, Engineering Maintenance Principles and Practices, Valve and Steam Trap Maintenance.
1987	Altantic Drydock	NDE Training - Level II MT, PT, RT, UT (Thickness), VT 1-4 (Mechanical, Dimensional, Welding).
1990	Western Stress	NDE Training
1992	PSESI	NDE Training

CERTIFICATIONS

Liquid Penetrant	Level II
Magnetic Particle	Level II
Visual (1-4)	Level II

EXPERIENCE

POWER SYSTEMS ENERGY SERVICES, INC., Windsor, Connecticut

04/92 to 06/92 Indian Point III - QC Inspector Level II Mechanical/Dimensional, MT, PT and VT 1-4. Performed support inspections for operations and maintenance and construction during refueling outage.

INTERNATIONAL VALVE AND INSTRUMENT CORP.

02/92 to 03/92 Palisades - Quality Verification Inspector. Performed support inspections for valve repair program.

PEAK TECHNICAL SERVICES

02/92 Commonwealth Edison - Joliet Power Plant - Senior Valve Technician. Performed preventative maintenance and repair on various valves.

11/91 Pleasant Prairie Power Plant - Senior Valve Technician. Performed preventative maintenance and repair on various valves.

NATIONAL INSPECTION AND CONSULTANTS

09/91 to 10/91 Vogtle - Senior Valve Technician. Performed prevention maintenance and repair on various valves and MOVs.

NUCLEAR SUPPORT SERVICES

08/90 to 12/90 D.C. Cook - Senior Valve Technician. Performed preventive maintenance and repair on various valves and MOVs.

EXPERIENCE (Continued)

BARRI & ASSOCIATES

04/90 to 05/90 Antelope & Leland Olds Power Plant - Senior Valve Technician. Performed preventive maintenance and repair on various valves.

PHILLIP RELIANCE

03/90 to 04/90 McGuire - RSG Platform Technician. Performed applicable duties involved in the sleeving of a reactor steam generator.

THE ATLANTIC GROUP

01/90 to 03/90 Catawba - Senior Mechanic. Performed various preventive maintenance and repair on condensers, heat exchangers, pumps and valves.

09/89 to 10/89 Yorktown - Senior Mechanic. Perfomred maintenance on boilers.

02/89 to 07/89 North Anna - Senior Mechanic. Performed testing, overhaul, removal and installation of small bore snubbers.

WESTERN STRESS, INC.

10/89 to 01/90 NDE Technician. Level II MT and PT. Perfomred inspections on various components and parts.

ATLANTIC DRYDOCK

07/87 to 04/88 QA/QC Inspector. Level II MT, PT, RT, UT (Thickness), VT 1-4. Performed quality reviews on vendors and MT, PT, RT, UT on parts and material compliance.

COMMISSIONER OF PUBLIC WORKS

10/84 to 06/87 Senior Pipefitter Supervisor. Supervised, coordinated, and evaluated personnel, material and equipment in the preventive maintenance and repair/installation of the wastewater system.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

VISION ACUITY EXAMINATION REPORT

Name: Ben Sanden SSN: 501-68-7826 Date: 9-2-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J 1	J
Left Eye	J 1	J
	(Pass) Fail	Pass Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/40	20/
Left Eye	20/25	20/
	(Pass) Fail	Pass Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Scott Larson	L III	9-2-93
Examined by	Title	Date

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* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

File: Benjamin Sanden

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL II

Benjamin Sanden is qualified as Level II in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	none	SEE ATTACHED VISION ACUITY REPORT

EDUCATION		Date Completed:	COLLEGE OR TECHNICAL		
	High School Graduate			Nondestructive Testing Hutchinson Technical College Hutchinson, Minnesota	DEGREE: AAS Completed: 12-01-90

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	12-01-90	120.00

Total: 120.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: H. B. Robinson			II	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
* ABB/Amdata	Windsor, Connecticut	03-17-93	08-27-93	IIL	Nuclear	2.34
General Electric	Atlanta, Georgia	01-15-90	09-18-92	II	Non-nuclear	19.80

* Denotes non-continuous experience. Total: 22.14

TOTAL EXPERIENCE 22.14 months of experience in ultrasonic examination

CERTIFICATION EXAMINATIONS

General Examination	90.00	(.3)	Exams administered:
Specific Examination	80.00	(.2)	09-01-93
Practical Examination	95.00	(.5)	Exams completed:
Composite Score	90.50		09-02-93

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-02-93

CERTIFIED BY

9-2-93

LEVEL III

DATE OF CERTIFICATION 09-02-93
DATE OF EXPIRATION 09-01-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Benjamin Sanden

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL I

Benjamin Sanden is qualified as Level I in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Color Contrast Only

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate International Falls High International Falls, MN		Date Completed: 06-01-73

COLLEGE OR TECHNICAL

Nondestructive Testing Hutchinson Technical College Hutchinson, Minnesota		DEGREE: AAS Completed: 12-01-90

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	12-01-90	55.00

Total: 55.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (list up to 12 PT assignments.)

EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION

	From	To	Level	Type	Months
SI: M. B. Robinson			I	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
* ABB/Amdata	Windsor, Connecticut	03-17-93	08-27-93	I-T	Nuclear	1.20

Total: 1.20

TOTAL EXPERIENCE 1.20 months of experience in penetrant examination

CERTIFICATION EXAMINATIONS

General Examination	93.33	(.3)	Exams administered:
Specific Examination	95.00	(.2)	09-08-93
Practical Examination	97.00	(.5)	Exams completed:
Composite Score	95.50		09-08-93

INITIAL CERTIFICATION DATES

Prior employment initial Level I certification: N/A
Initial Level I certification issued by NES: 09-10-93

CERTIFIED BY

Scott Larson 9-10-93

LEVEL III

DATE OF CERTIFICATION 09-10-93
DATE OF EXPIRATION 09-08-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Benjamin Sanden

High School Graduate
International Falls High
International Falls, MN

Date Completed: 06-01-73

Nondestructive Testing
Hutchinson Technical College
Hutchinson, Minnesota

DEGREE: AAS
Completed: 12-01-90

DATE OF EYE EXAM: 09-02-93
CORRECTIVE LENSES REQUIRED:
Near: No Far: No
EYE EXAM DUE: 09-02-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	45.00	Ultrasonics:	120.00	IGSCC Sizing:	0.00
Penetrant:	55.00	Visual:	85.00	Weld Overlay:	0.00
Radiography:	160.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	0.00	0.00	0.00	
Penetrant:	0.00	1.20	1.20	Color Contrast Only
Radiography:	0.00	0.00	0.00	
Ultrasonics:	0.00	22.14	22.14	None
Visual:	0.00	0.00	0.00	

	DATE OF CURRENT CERTIFICATION				DATE OF EXPIRATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle								
Penetrant		09-10-93				09-08-96		
Radiography								
Ultrasonics			09-02-93				09-01-96	
Visual								

IGSCC Detection (Manual) _____ _____

IGSCC Sizing (Manual) _____ _____

Weld Overlay (Manual) _____ _____

Nozzle Inner Radius Qualification _____

	PREVIOUS EMPLOYMENT INITIAL CERTIFICATION				DATE OF INITIAL NES CERTIFICATION			
	Trainee	I	II	III	Trainee	I	II	III
Magnetic Particle								
Penetrant						09-10-93		
Radiography								
Ultrasonics							09-02-93	
Visual								

IGSCC Detection _____ _____

IGSCC Sizing _____ _____

Weld Overlay _____ _____

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

9-10-93
Date

NAME: Benjamin Sanden

EDUCATION AND TRAINING RECORD

EDUCATION

Nondestructive Examination

Date Completed: Nondestructive Testing, Hutchinson Technical College, Hutchinson, Minnesota

DEGREE: AAS Completed: 12-01-90

Education credited toward NDE certifications: 12 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	12-01-90	45.00
					Total this page:	45.00
					TOTAL:	45.00
PT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	12-01-90	55.00
					Total this page:	55.00
					TOTAL:	55.00
RT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	12-01-90	160.00
					Total this page:	160.00
					TOTAL:	160.00
UT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	12-01-90	120.00
					Total this page:	120.00
					TOTAL:	120.00
	IGSCC Detection Hrs: 0.00	IGSCC Sizing Hrs: 0.00	Weld Overlay Hrs: 0.00		Nozzle Inner Radius Hrs:	0.00
VT	Hutchinson Tech. College	Hutchinson, Minnesota	Level I and II	N/A	12-01-90	85.00
					Total this page:	85.00
					TOTAL:	85.00

e education and training required for ertification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Technical Director's Designee

Date 9/2/93

NES — NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810. (203) 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: Benjamin Sanden

NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT					
				TOTAL:	0.00
PT ISI: H. B. Robinson			I	Nuclear	
				TOTAL:	0.00
RT					
				TOTAL:	0.00
UT ISI: H. B. Robinson			II	Nuclear	
				TOTAL:	0.00
VT					
				TOTAL:	0.00

The NES experience required for certification documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-10-93
Date

NES, Inc. SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Benjamin Sanden

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT							
					TOTAL:	0.00	
PT	* ABB/Amdata	Windsor, Connecticut	Nuclear	03-17-93	08-27-93	1.20	I-T
					Total this page:	1.20	
					TOTAL:	1.20	
RT							
					TOTAL:	0.00	
UT	* ABB/Amdata	Windsor, Connecticut	Nuclear	03-17-93	08-27-93	2.34	IIL
	General Electric	Atlanta, Georgia	Non-nuclear	01-15-90	09-18-92	19.80	II
					Total this page:	22.14	
					TOTAL:	22.14	
VT							
					TOTAL:	0.00	

*denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-10-93
Date

Resume for
Benjamin R. Sanden

EXPERIENCE

ABB/AMDATA, Windsor, Connecticut

03/93 to 08/93 Level II UT

ATLANTA STAFF, INC., Atlanta, Georgia

09/92 to 10/92 PSE&G, Hope Creek - UT Level II, Erosion Corrosion

QUALITY TECHNOLOGY CENTER, Cincinnati, Ohio

01/90 to 09/92 Level II UT, NDT and Metallurgy

EDUCATION

Hutchinson Technical College - Associates Degree, NDT and Metallurgy

CERTIFICATIONS

Ultrasonics Level II

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Benjamin Sanden

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT							
					TOTAL:	0.00	
PT							
					TOTAL:	0.00	
					TOTAL:	0.00	
UT	* ABB/Amdata	Windsor, Connecticut	Nuclear	03-17-93	08-27-93	2.34	IIL
	General Electric	Atlanta, Georgia	Non-nuclear	01-15-90	09-18-92	19.80	II
					Total this page:	22.14	
					TOTAL:	22.14	
VT							
					TOTAL:	0.00	

* Denotes non-continuous experience.
previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Technical Director's Designee

Date 9/2/93

VISION ACUITY EXAMINATION REPORT

Name: Eugene Simpson SSN: 416-84-8333 Date: 8 24-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J 1	J
Left Eye	J 1	J
	(Pass)/Fail	Pass/Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/20	20/
Left Eye	20/20	20/
	(Pass)/Fail	Pass/Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers 1-14 for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Examined by	Title	Date
[signature]	LIII	8-24-93

* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT			ET		
PT			LT		
RT			VT		
UT			QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 797-6300

File: Eugene Simpson

CERTIFICATE OF QUALIFICATION

MAGNETIC PARTICLE EXAMINATION

LEVEL II

Eugene Simpson is qualified as Level II in Magnetic Particle Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS	Visible Only	SEE ATTACHED VISION ACUITY REPORT
EDUCATION	High School Graduate Geneva High School Geneva, Alabama	Date Completed: 05-27-77
COLLEGE OR TECHNICAL	N/A	

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	09-07-79	24.00

Total: 24.00

NES EXPERIENCE

MAGNETIC PARTICLE EXAMINATION ASSIGNMENTS (List up to 12 MT assignments.)	EXPERIENCE AT EACH LEVEL OF MT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	MT EXPERIENCE Level	Type	Months
* United States Testing	Hoboken, New Jersey	09-10-82	10-22-87	II	Nuclear/Non	9.20
* Ebasco Services, Inc.	New York, New York	10-26-87	07-27-90	II	Nuclear	7.00
* Conam Inspection	Itasca, Illinois	02-04-90	08-31-91	II	Nuclear	2.40
Virginia Corporation	Richmond, Virginia	12-31-91	04-10-92	II	Nuclear	4.00
* PSESI	Windsor, Connecticut	08-08-88	08-01-92	II	Nuclear	7.00

* Denotes non-continuous experience. Total: 29.60

TOTAL EXPERIENCE 29.60 months of experience in magnetic particle examination

CERTIFICATION EXAMINATIONS

General Examination	80.00	(.3)	Exams administered: 08-11-92
Specific Examination	80.00	(.2)	
Practical Examination	97.00	(.5)	Exams completed: 08-12-92
Composite Score	88.50		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-01-92

CERTIFIED BY

W J Mason 9/1/92

LEVEL III EXAMINER President

DATE OF CERTIFICATION 09-01-92
DATE OF EXPIRATION 08-11-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 797-6900

File: Eugene Simpson

CERTIFICATE OF QUALIFICATION

ULTRASONIC THICKNESS

LEVEL II/T

Eugene Simpson is qualified as Level II in Ultrasonic Thickness in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Thickness Only

SEE ATTACHED VISION ACUITY REPORT

EDUCATION: High School Graduate, Geneva High School, Geneva, Alabama — Date Completed: 05-27-77

COLLEGE OR TECHNICAL: N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	09-07-79	80.00

Total: 80.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II-T	Nuclear	

Total: N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
* United States Testing	Hoboken, New Jersey	09-10-82	10-22-87	I-T	Nuclear	1.00
* Ebasco Services, Inc.	New York, New York	10-26-87	07-27-90	I-T	Nuclear	7.00
* Conam Inspection	Itasca, Illinois	02-04-90	08-31-91	II	Nuclear	2.40
Virginia Corporation	Richmond, Virginia	12-31-91	04-10-92	II	Nuclear	4.00

Total: 14.40

* : Denotes non-continuous experience.

TOTAL EXPERIENCE

14.40 months of experience in ultrasonic examina

Rudolfo Palliman

CERTIFICATION EXAMINATIONS

General Examination	72.50	(.3)	Exams administered:
Specific Examination	85.00	(.2)	08-12-92
Practical Examination	95.00	(.5)	Exams completed:
Composite Score	86.25		08-12-92

INITIAL CERT

Prior e cation: N/A

Initial Level II certification issued by NES: 09-01-92

CERTIFIED BY

LEVEL III EXAMINER

DATE OF CERTIFICATION: 09-01-92

DATE OF EXPIRATION: 08-12-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

File: Eugene Simpson

CERTIFICATE OF QUALIFICATION

PENETRANT EXAMINATION

LEVEL II

Eugene Simpson is qualified as Level II in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS: Color Contrast Only	SEE ATTACHED VISION ACUITY REPORT
EDUCATION: High School Graduate, Geneva High School, Geneva, Alabama — Date Completed: 05-27-77	COLLEGE OR TECHNICAL: N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	09-07-79	16.00

Total: 16.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)	EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II	Nuclear	

Total: N A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	PT EXPERIENCE Level	Type	Months
* United States Testing	Hoboken, New Jersey	09-10-82	10-22-87	II	Nuclear Non	17.25
* Ebasco Services	New York, New York	10-26-87	07-27-90	II	Nuclear	1.[illegible]
* Conam Inspection	Itasca, Illinois	02-04-90	08-31-91	II	Nuclear	2.40
Virginia Corporation	Richmond, Virginia	12-31-91	04-10-92	II	Nuclear	4.00
* PSESI	Windsor, Connecticut	08-08-88	08-01-92		Nuclear	7.00

* Denotes non-continuous experience.

Total: 37.65

TOTAL EXPERIENCE: 37.65 months of experience in penetrant

CERTIFICATION EXAMINATIONS

General Examination	96.66	(.3)	Exams administered: 08-11-92
Specific Examination	80.00	(.2)	
Practical Examination	93.00	(.5)	Exams completed: 08-11-92
Composite Score	91.50		

Mitchell Dugan

Certification: N/A
Issued by NES: 09-01-92

DATE OF CERTIFICATION: 09-01-92
DATE OF EXPIRATION: 08-11-95

CERTIFIED BY: [signature] 9/1/92

LEVEL III EXAMINER

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 [illegible]

File: Eugene Simpson

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL I

Eugene Simpson is qualified as Level I in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: LI-Manual; LII-Thickness

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate
Geneva High School
Geneva, Alabama
Date Completed: 05-27-77

COLLEGE OR TECHNICAL: N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	09-07-79	80.00
			Total:	80.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II-T	Nuclear	
				Total:	N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
* United States Testing	Hoboken, New Jersey	09-10-82	10-22-87	I-T	Nuclear	1.00
* Ebasco Services, Inc.	New York, New York	10-26-87	07-27-90	I-T	Nuclear	7.00
* Conam Inspection	Itasca, Illinois	02-04-90	08-31-91	II	Nuclear	2.40
Virginia Corporation	Richmond, Virginia	12-31-91	04-10-92	II	Nuclear	4.00
				Total:		14.40

TOTAL EXPERIENCE: 14.40 months of experience in ultrasonic examinatio

CERTIFICATION EXAMINATIONS

General Examination	97.50	(.3)	Exams administered:
Specific Examination	100.00	(.2)	08-23-93
Practical Examination	87.00	(.5)	Exams completed:
Composite Score	92.75		08-24-93

INITIAL CERTIFI: Clifford Anderson

Prior employm : N/A

Initial Level [illegible] 08-26-93

CERTIFIED BY

8/26/93

LEVEL III

DATE OF CERTIFICATION: 08-26-93

DATE OF EXPIRATION: 08-23-96

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

File: Eugene Simpson

CERTIFICATE OF QUALIFICATION

Reissued to include CP&L Practical requirements.

VISUAL EXAMINATION

LEVEL II

Eugene Simpson is qualified as Level II in Visual Examination in accordance with the requirements of Nuclear Energy Services' Procedure No. 80A9069, Revision 14: Certification of Visual Examination Personnel. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 83A4376, Revision 5.

CERTIFICATION RESTRICTIONS: None - VT-1,2,3,4

SEE ATTACHED VISION ACUITY REPORT

EDUCATION

High School Graduate
Geneva High School
Geneva, Alabama
Date Completed: 05-27-77

COLLEGE OR TECHNICAL: N/A

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	09-07-79	40.00
			Total:	40.00

NES EXPERIENCE

VISUAL EXAMINATION ASSIGNMENTS (List up to 12 VT assignments.)	EXPERIENCE AT EACH LEVEL OF VT CERTIFICATION From	To	Level	Type	Months
ISI: Seabrook			II	Nuclear	
				Total:	N/A

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	VT EXPERIENCE Level	Type	Months
* United States Testing	Hoboken, New Jersey	09-10-82	10-22-87	II	Nuclear/Non	29.65
* Ebasco Services, Inc.	New York, New York	10-26-87	07-27-90	II	Nuclear	17.00
* Conam Inspection	Itasca, Illinois	02-04-90	08-31-91	II	Nuclear	2.40
Virginia Corporation	Richmond, Virginia	12-31-91	04-10-92	II	Nuclear	4.00
* PSESI	Windsor, Connecticut	08-08-88	08-01-92	II	Nuclear	7.00
				Total:		60.05

* Denotes non-continuous experience.

TOTAL EXPERIENCE: 60.05 months of visual examination/related inspection experience.

CERTIFICATION EXAMINATIONS

General Examination	80.00	(.3)	Exams administered: 01-06-92
Specific Examination	82.00	(.2)	
Practical Examination	95.50	(.5)	Exams completed: 08-24-93
Composite Score	88.15		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 09-01-92

CERTIFIED BY

8-27-93

LEVEL III

DATE OF CERTIFICATION: 08-26-93
DATE OF EXPIRATION: 01-06-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NES, Inc. SHELTER ROCK ROAD DANBURY, CONNECTICUT 06810 (203) 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Eugene Simpson

High School Graduate
Geneva High School
Geneva, Alabama

Date Completed: 05-27-77

DATE OF EYE EXAM: 08-24-93
CORRECTIVE LENSES REQUIRED:
Near: No Far: No
EYE EXAM DUE: 08-24-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	24.00	Ultrasonics:	80.00	IGSCC Sizing:	0.00
Penetrant:	16.00	Visual:	40.00	Weld Overlay:	0.00
Radiography:	80.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	3.75	29.60	33.35	Visible Only
Penetrant:	3.75	37.65	41.40	Color Contrast Only
Radiography:	1.00	0.00	1.00	
Ultrasonics:	3.75	14.40	18.15	LI-Manual; LII-Thickness
Visual:	3.75	60.05	63.80	None - VT-1,2,3,4

DATE OF CURRENT CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			09-01-92	
Penetrant			09-01-92	
Radiography				
Ultrasonics		08-26-93	09-01-92	
Visual			08-26-93	

DATE OF EXPIRATION

	Trainee	I	II	III
Magnetic Particle			08-11-95	
Penetrant			08-11-95	
Radiography				
Ultrasonics		08-23-96	08-12-95	
Visual			01-06-95	

IGSCC Detection (Manual) _____ _____

IGSCC Sizing (Manual) _____ _____

Weld Overlay (Manual) _____ _____

Nozzle Inner Radius Qualification _____

PREVIOUS EMPLOYMENT INITIAL CERTIFICATION

	Trainee	I	II	III
Magnetic Particle				
Penetrant				
Radiography				
Ultrasonics				
Visual				

DATE OF INITIAL NES CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			09-01-92	
Penetrant			09-01-92	
Radiography				
Ultrasonics		08-26-93	09-01-92	
Visual			09-01-92	

IGSCC Detection _____ _____

IGSCC Sizing _____ _____

Weld Overlay _____ _____

ll certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

9-1-93
Date

NES — NES, Inc. SHELTER ROCK ROAD, DANBURY CONNECTICUT 06810 (203) 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

IE: Eugene Simpson

NDE ASSIGNMENTS

List assignments in which the individual was working in the capacity for which he was certified.

EXPERIENCE AT EACH LEVEL OF CERTIFICATION

		FROM	TO	LEVEL	TYPE	MONTHS
MT	ISI: Seabrook	09-09-92	10-15-92	II	Nuclear	1.25
	ISI: Calvert Cliffs	03-15-93	06-01-93	II	Nuclear	2.50
	ISI: H. B. Robinson	08-30-93	present	II	Nuclear	
					Total this page:	3.75
					TOTAL:	3.75
PT	ISI: Seabrook	09-09-92	10-15-92	II	Nuclear	1.25
	ISI: Calvert Cliffs	03-15-93	06-01-93	II	Nuclear	2.50
	ISI: H. B. Robinson	08-30-93	present	II	Nuclear	
					Total this page:	3.75
					TOTAL:	3.75
RT	Enrico Fermi	01-06-82	02-01-82	I	Nuclear	1.00
					Total this page:	1.00
					TOTAL:	1.00
UT	ISI: Seabrook	09-09-92	10-15-92	II-T	Nuclear	1.25
	ISI: Calvert Cliffs	03-15-93	06-01-93	II-T	Nuclear	2.50
	ISI: H. B. Robinson	08-30-93	present	I/II-T	Nuclear	
					Total this page:	3.75
					TOTAL:	3.75
VT	ISI: Seabrook	09-09-92	10-15-92	II	Nuclear	1.25
	ISI: Calvert Cliffs	03-15-93	06-01-93	II	Nuclear	2.50
	ISI: H. B. Robinson	08-30-93	present	II	Nuclear	
					Total this page:	3.75
					TOTAL:	3.75

The NES experience required for certification documented in this individual's certification .e in accordance with NES Document 80A9068 and/or 80A9069.

Mary Ellen Allen
Technical Director's Designee

9-1-93
Date

Nondestructive Examination

EDUCATION AND TRAINING RECORD

NAME: Eugene Simpson

EDUCATION

High School Graduate
Geneva High School
Geneva, Alabama

Date Completed: 05-27-77

Education credited toward NDE certifications: 12 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	N/A	09-07-79	24.00
					Total this page:	24.00
					TOTAL:	24.00
PT	Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	N/A	09-07-79	16.00
					Total this page:	16.00
					TOTAL:	16.00
RT	Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	N/A	09-07-79	80.00
					Total this page:	80.00
					TOTAL:	80.00
UT	Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	N/A	09-07-79	80.00
					Total this page:	80.00
					TOTAL:	80.00

IGSCC Detection Hrs: 0.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

VT	Union Carbide T.A.T.	Oak Ridge, Tennessee	Level I and II	N/A	09-07-79	40.00
					Total this page:	40.00
					TOTAL:	40.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

9-2-92
Date

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: Eugene Simpson

	NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT	ISI: Seabrook			II	Nuclear	
					TOTAL:	0.00
PT	ISI: Seabrook			II	Nuclear	
					TOTAL:	0.00
RT	Enrico Fermi	01-06-82	02-01-82	I	Nuclear	1.00
					Total this page:	1.00
					TOTAL:	1.00
UT	ISI: Seabrook			II-T	Nuclear	
					TOTAL:	0.00
VT	ISI: Seabrook			II	Nuclear	
					TOTAL:	0.00

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary Ellen Allen
Technical Director's Designee

4-2-92
Date

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-6000

Nondestructive Examination

PREVIOUS EXPERIENCE RECORD

NAME: Eugene Simpson

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT	* United States Testing	Hoboken, New Jersey	Nuclear/Non	09-10-82	10-22-87	9.20	II
	* Ebasco Services, Inc.	New York, New York	Nuclear	10-26-87	07-27-90	7.00	II
	* Conam Inspection	Itasca, Illinois	Nuclear	02-04-90	08-31-91	2.40	II
	Virginia Corporation	Richmond, Virginia	Nuclear	12-31-91	04-10-92	4.00	II
	* PSESI	Windsor, Connecticut	Nuclear	08-08-88	08-01-92	7.00	II
					Total this page:	29.60	
					TOTAL:	29.60	
PT	* United States Testing	Hoboken, New Jersey	Nuclear/Non	09-10-82	10-22-87	17.25	II
	* Ebasco Services	New York, New York	Nuclear	10-26-87	07-27-90	7.00	II
	* Conam Inspection	Itasca, Illinois	Nuclear	02-04-90	08-31-91	2.40	II
	Virginia Corporation	Richmond, Virginia	Nuclear	12-31-91	04-10-92	4.00	II
	* PSESI	Windsor, Connecticut	Nuclear	08-08-88	08-01-92	7.00	
					Total this page:	37.65	
					TOTAL:	37.65	
RT							
					TOTAL:	0.00	
UT	* United States Testing	Hoboken, New Jersey	Nuclear	09-10-82	10-22-87	1.00	I-T
	* Ebasco Services, Inc.	New York, New York	Nuclear	10-26-87	07-27-90	7.00	I-T
	* Conam Inspection	Itasca, Illinois	Nuclear	02-04-90	08-31-91	2.40	II
	Virginia Corporation	Richmond, Virginia	Nuclear	12-31-91	04-10-92	4.00	II
					Total this page:	14.40	
					TOTAL:	14.40	
VT	* United States Testing	Hoboken, New Jersey	Nuclear/Non	09-10-82	10-22-87	29.65	II
	* Ebasco Services, Inc.	New York, New York	Nuclear	10-26-87	07-27-90	17.00	II
	* Conam Inspection	Itasca, Illinois	Nuclear	02-04-90	08-31-91	2.40	II
	Virginia Corporation	Richmond, Virginia	Nuclear	12-31-91	04-10-92	4.00	II
	* PSESI	Windsor, Connecticut	Nuclear	08-08-88	08-01-92	7.00	II
					Total this page:	60.05	
					TOTAL:	60.05	

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Allen
Technical Director's Designee

4-2-92
Date

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

Resume for
Eugene Simpson

EDUCATION

1977 Geneva High School, Geneva, Alabama
1979 Enterprise State Junior College, Enterprise, Alabama

TRAINING

1979	TAT-Oak Ridge Associated Universities, Oak Ridge, Tennessee - Nondestructive testing trainee; received practical and classroom training in ET, RT, PT, UT, MT, blueprint reading, physics, math, metallographics, and destructive testing techniques.
03/92	EPRI NDE Center, Charlotte, North Carolina - Certified VT-1,2,3 Level II

EXPERIENCE

NUCLEAR ENERGY SERVICES, INC., Danbury, Connecticut

09/92 to Present	Seabrook - Certified Level II MT, PT, VT 1-4, UT Level II Thickness.
07/20/87 to 09/12/87	North Anna - QC Inspector Level II VT 1-4, Electrical, Mechanical, Visual Welding. Performed outage support inspections for operations and maintenance.
12/81 to 02/82	J.A. Fitzpatrick and Fermi - NDE/ISI Inspector Level II RT and performed MT and PT inspections.

POWER SYSTEMS ENERGY SERVICES, INC., Windsor, Connecticut

04/14/92 to 08/92	Indian Point III - QC Inspector Level II Mechanical/Dimensionsal, Electrical, MT, PT and VT 1-4. Performed Support inspections for O&M and construction during Refuel Outage.
08/08/88 to 11/19/88	J.A.Fitzpatrick - QC Inspector Level II Mechanical, PT, MT and VT 1-4. Performed inspections of pipe supports, welding and snubber rebuilding, replacement and testing during outage for operations and maintenance.

VIRGINIA CORPORATION OF RICHMOND, Richmond, Virginia

12/31/91 to 04/10/92	North Anna - ISI/NDE Inspector Level II MT, PT, VT-1,2,3, UT(R/L-wave). Performed inspections for power piping and maintenance support during outage.

ITI MOVATS INCORPORATED

09/09/91 to 11/13/91	Comanche Peak - QC Inspector, Level II Mechanical, Electrical (terminations), Welding and PT. Performed inspections on manual and motor operated valves and actuators during outage.

CONAM INSPECTION, INC., Itasca, Illinois

08/06/91 to 08/31/91	Seabrook - NDE Inspector, Level II MT, PT, and UT (R/L-wave). Performed E&C inspections.
02/04/90 to 03/23/90	Quad Cities - ISI/NDE Inspector, Level II MT, PT and UT (R/L-wave). Performed inspections on E&C, BOP and ISI activities.

EXPERIENCE (Continued)

COMBUSTION ENGINEERING, Windsor, Connecticut

09/85 to 10/85 — Fort Calhoun - QC Inspector Level II VT 1-4, MT, PT and Electrical (limited).

06/12/85 to 08/13/85 — Indian Point III - QC Inspector Level II VT 1-4, MT, PT and performed some UT thickness.

BUTLER SERVICES for STONE & WEBSTER ENGINEERING

07/84 to 12/03/84 — Nine Mile Point Unit II - QC Inspector Level II MT, PT, Welding and Documentation. Performed second line inspections, document review and final walkdowns.

QC LABORATORIES

09/81 to 12/81 — St. Lucie and QC Labs - Performed eddy current inspections of condensor tubes at St. Lucie and performed MT, PT and RT on aerospace parts at QC Labs.

LAW ENGINEERING & TESTING COMPANY

01/81 to 07/81 — NDE Inspector Level II MT, and Level I RT and performed visual inspections.

SOUTHERN RESEARCH INSTITUTE

10/15/79 to 01/04/81 — NDT Technician Trainee. Performed inspections utilizing RT, UT, VT, ET, Metallurgy, Open Porosity, X-ray duplication, and other NDT methods.

GENERAL ELECTRIC

10/90 — Certified at Norcross, Georgia. Level II MT, PT, VT 1-4, Electrical, UT Level I.

EXPERIENCE (Continued)

NPS TECHNICAL SERVICES, Richmond, Virginia

08/26/90 to 06/04/91	North Anna/Surry - QC Inspector, Level II Mechancial, Electrical, I&C, and Visual Welding.
01/15/89 to 06/27/89	North Anna - QC Inspector Level II Visual Welding, Mechanical/Electrical and I&C.

EBASCO SERVICES, INC., New York, New York

03/26/90 to 07/27/90	Maine Yankee/Connecticut Yankee - ISI/NDE Inspector Level II MT, PT, VT 1-4, and UT I-T. Supported inspections on E&C and ISI activities.
09/10/89 to 12/08/89	Connecticut Yankee - ISI/NDE Inspector Level II MT, PT, VT 1-4, and UT-IT. Supported inspections on ISI E&C activities.
10/26/87 to 08/02/88	Comanche Peak - QC Specialist Level II Civil/Structural and Visual Welding. Performed the post construction hardware validation walkdown relative to miscellaneous steel, structural embedments, electrical equipment that supports welds and concrete anchors.

UNITED STATES TESTING COMPANY, Hoboken, New Jersey

09/15/87 to 10/22/87	Grand Gulf - QC Inspector Level II VT 1-4, Mechanical and Expansion Anchors. Performed inspection of supports and snubbers prior to start of outage.
01/19/87 to 06/27/87	North Anna and Saint Lucie - QC Inspector Level II MT, PT, VT 1-4, Electrical (limited). Performed support inspections for operations and maintenance.
07/20/86 to 08/20/86	Rancho Seco - QC Inspector Level II PT and Mechanical. Provided support inspection during steam generators tube sleeving operation.
05/20/86 to 06/24/86	Dresden - QC Inspector. Performed walkdown verification of design modification pertaining to safety related electrical equipment, instrumentation and associated hardware, and mechanical design verification as required.
04/10/86 to 05/12/86	Morgantown Electric - Lead QC Inspector Level II Mechanical, PT, Visual Welding. Performed inspections of valves, welding and piping during outage.
12/02/85 to 04/06/86	Indian Point - QC Inspector Level II Mechanical, PT and Visual Welding. Performed inspections for operations and maintenance during outage.
08/16/85 to 09/20/85	Clinton - QC Inspector. Performed walkdown verification of structural components.
01/85 to 05/85	J.A. Fitzpatrick - QC Inspector Level II MT, PT, Visual Welding and Mechanical. Performed inspections for operations and maintenance during outage.
12/84 to 01/85	Jacksonville Shipyard - NDE Inspector, performed ultrasonic thickness inspections on drydock.
09/10/82 to 07/84	Quad Cities, St. Lucie, Fitzpatrick, Morgantown and Potomac River - QC/NDE/ISI Inspector Level II MT, PT, Visual Welding, Mechanical, and Radiographer helper during outages for operations and maintenance.

GILBERT COMMONWEALTH, Reading, Pennsylvania

06/26/86 to 07/09/86	Certified only. Level II VT 1-4, MT and PT.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

VISION ACUITY EXAMINATION REPORT

Name: Steve Willwin SSN: 473-54-0964 Date: 3-8-93

EXAMINATION RESULTS:

NEAR VISION

Passing: Jaeger #1 at not less than 12" in at least one eye

	UNCORRECTED	CORRECTED
Right Eye	J 1	J N/A
Left Eye	J 1	J N/A
	(Pass)/Fail	Pass/Fail

DISTANCE VISION

Passing: 20/30 in at least one eye

Right Eye	20/ 20	20/ N/A
Left Eye	20/ 20	20/ N/A
	(Pass)/Fail	Pass/Fail

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers N/A for Color Blindness. This examination indicates (normal) (abnormal)* color vision.

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE or QC certification in accordance with NES Procedures 80A9037, 80A9068 or 80A9069.

Examined by	Title	Date
Scott Lawson	Level III	3-8-93

==========

* If the Ishihara examination indicated abnormal color vision, the ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT	Scott Lawson	3-8-93	ET	N/A	
PT	Scott Lawson	3-8-93	LT	N/A	
RT	N/A	N/A	VT	N/A	
UT	Scott Lawson	3-8-93	QC		
	Level III Examiner	Date		Level III Examiner	Date

Revised: 03-31-92

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Steven P. Wollum

CERTIFICATE OF QUALIFICATION

Reissued to correct previous experience information. Date of certification remains as 3-02-92.

PENETRANT EXAMINATION

LEVEL II

Steven P. Wollum is qualified as Level II in Penetrant Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 30A9068, Revision 3, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 30A4376, Revision 5.

CERTIFICATION RESTRICTIONS: Unrestricted

SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Canby High School Canby, Minnesota	Date Completed: 06-01-78	COLLEGE OR TECHNICAL	Nondestructive Testing Hutchinson Vo-Tech Institute Hutchinson, Minnesota	DEGREE: AAS Completed: 05-26-88

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	05-26-88	106.00

Total: 106.00

NES EXPERIENCE

PENETRANT EXAMINATION ASSIGNMENTS (List up to 12 PT assignments.)	EXPERIENCE AT EACH LEVEL OF PT CERTIFICATION From	To	Level	Type	Months
ISI: Callaway	03-21-92	04-19-92	II	Nuclear	0.15

Total: 0.15

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	Level	PT EXPERIENCE Type	Months
Twin City Testing	St. Paul, Minnesota	09-15-88	02-10-89	II	Non-nuclear	3.00

* Denotes non-continuous experience.

Total: 3.00

TOTAL EXPERIENCE: 3.15 months of experience in penetrant examination

CERTIFICATION EXAMINATIONS

General Examination	100.00	(.3)	Exams administered: 02-20-92
Specific Examination	90.00	(.2)	
Practical Examination	91.00	(.5)	Exams completed: 02-21-92
Composite Score	93.50		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N.A.

Initial Level II certification issued by NES: 03-02-92

CERTIFIED BY

12-01-92

LEVEL III EXAMINER

DATE OF CERTIFICATION: 03-02-92

DATE OF EXPIRATION: 02-20-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: Steven P. Wollum

Reissued to correct previous experience information. Date of certification remains as 3-02-92.

CERTIFICATE OF QUALIFICATION

MAGNETIC PARTICLE EXAMINATION

LEVEL II

Steven P. Wollum is qualified as Level II in Magnetic Particle Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 30A9068, Revision 3, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services. This certification also meets the requirements of NES Procedure 33A4376, Revision 5.

CERTIFICATION RESTRICTIONS	Unrestricted	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Canby High School Canby, Minnesota	Date Completed: 06-01-78	COLLEGE OR TECHNICAL	Nondestructive Testing Hutchinson Vo-Tech Institute Hutchinson, Minnesota	DEGREE: AAS Completed: 05-26-88

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	05-26-88	116.00

Total: 116.00

NES EXPERIENCE

MAGNETIC PARTICLE EXAMINATION ASSIGNMENTS (List up to 12 MT assignments.)	EXPERIENCE AT EACH LEVEL OF MT CERTIFICATION From	To	Level	Type	Months
ISI: Callaway	03-21-92	04-19-92	II	Nuclear	0.15

Total: 0.15

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	Level	MT EXPERIENCE Type	Months
Twin City Testing	St. Paul, Minnesota	09-15-88	02-10-89	II	Non-nuclear	4.00

* Denotes non-continuous experience.

Total: 4.00

TOTAL EXPERIENCE: 4.15 months of experience in magnetic particle examination

CERTIFICATION EXAMINATIONS

General Examination	96.67	(.3)	Exams administered: 02-19-92
Specific Examination	85.00	(.2)	
Practical Examination	98.00	(.5)	Exams completed: 02-21-92
Composite Score	95.00		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 03-02-92

DATE OF CERTIFICATION 03-02-92
DATE OF EXPIRATION 02-19-95

CERTIFIED BY

12-04-92

LEVEL III EXAMINER

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

File: Steven P. Wollum

CERTIFICATE OF QUALIFICATION

Cert reissued to correct experience. See NCR 1352.

ULTRASONIC EXAMINATION

LEVEL I

Steven P. Wollum is qualified as Level I in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 30A9068, Revision 3, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	L1 - None; L2 - Thickness	SEE ATTACHED VISION ACUITY REPORT

EDUCATION	High School Graduate Canby High School Canby, Minnesota	Date Completed: 06-01-88	COLLEGE OR TECHNICAL	Nondestructive Testing Hutchinson Vo-Tech Institute Hutchinson, Minnesota	DEGREE: AAS Date Completed: 05-26-88

TRAINING

Institution Organization	Location	Type	Date Completed	Hours
Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	05-26-88	406.00
Nuclear Energy Services.	Danbury, Connecticut	RCP Flywheel	04-15-92	3.50

Total: 409.50

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
ISI: Arkansas Nuclear One	03-10-92	03-16-92	Trainee	Nuclear	.30
ISI: Callaway	03-21-92	04-19-92	Trainee	Nuclear	.44
ISI: Shearon Harris	08-24-92	09-25-92	Trainee	Nuclear	.51
ISI: Shearon Harris	09-25-92	11-20-92	Trainee	Nuclear	.27

Total: 4.52

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months

Total: N A

TOTAL EXPERIENCE

4.52 months of experience in ultrasonic examination

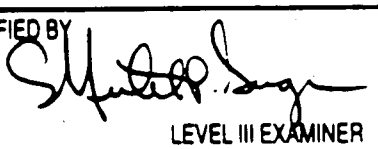
CERTIFICATION EXAMINATIONS

General Examination	92.50	(.3)	Exams administered:
Specific Examination	80.00	(.2)	02-19-92
Practical Examination	84.00	(.5)	Exams completed:
Composite Score	85.75		02-27-92

INITIAL CERTIFICATION DATES

Prior employment initial Level I certification: N A
Initial Level I certification issued by NES: 02-03-93

CERTIFIED BY



2-3-93

LEVEL III EXAMINER

DATE OF CERTIFICATION 02-03-93
DATE OF EXPIRATION 02-19-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 203/ 796-5000

File: Steven P. Wollum

CERTIFICATE OF QUALIFICATION

Cert reissued to correct experience. See NCR 1352.

ULTRASONIC THICKNESS

LEVEL II T

Steven P. Wollum is qualified as Level II in Ultrasonic Thickness in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 10A0064, Revision 3, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS: Thickness Only		SEE ATTACHED VISION ACUITY REPORT		
EDUCATION	High School Graduate Lanby High School Lanby, Minnesota	Date Completed: 06-01-79	COLLEGE OR TECHNICAL	Nondestructive Testing Hutchinson Vo-Tech Institute Hutchinson, Minnesota	Degree: AAS Completed: 05-15-83

TRAINING

Institution Organization	Location	Type	Date Completed	Hours
Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	05-26-88	406.00
Nuclear Energy Services	Danbury, Connecticut	RCP Flywheel	04-15-92	3.50

Total: 409.50

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS (List up to 12 UT assignments.)	EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION From	To	Level	Type	Months
TSI: Arkansas Nuclear One	03-10-92	03-16-92	Trainee	Nuclear	0.30
TSI: Callaway	03-21-92	04-19-92	Trainee	Nuclear	0.94
TSI: Shearon Harris	08-24-92	09-25-92	Trainee	Nuclear	1.01
TSI: Shearon Harris	09-25-92	11-20-92	Trainee	Nuclear	2.27

Total: 4.52

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months

Total: N/A

TOTAL EXPERIENCE

4.52 months of experience in ultrasonic examination

CERTIFICATION EXAMINATIONS

General Examination	85.00	(.3)	Exams administered: 09-03-92
Specific Examination	80.00	(.2)	
Practical Examination	100.00	(.5)	Exams completed: 09-21-92
Composite Score	91.50		

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: N/A
Initial Level II certification issued by NES: 02-03-93

CERTIFIED BY

LEVEL III EXAMINER 2-3-93

DATE OF CERTIFICATION 02-03-93
DATE OF EXPIRATION 09-03-95

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

Nondestructive Examination

QUALIFICATION RECORD

NAME: Steven P. Wollum

High School Graduate
Canby High School
Canby, Minnesota

Date Completed: 06-01-78

Nondestructive Testing
Hutchinson Vo-Tech Institute
Hutchinson, Minnesota

DEGREE: AAS
Completed: 05-26-88

DATE OF EYE EXAM: 03-08-93
CORRECTIVE LENSES REQUIRED:
Near: No Far: No
EYE EXAM DUE: 03-08-94

CLASSROOM TRAINING HOURS:

Magnetic Particle:	116.00	Ultrasonics:	409.50	IGSCC Sizing:	0.00
Penetrant:	106.00	Visual:	60.00	Weld Overlay:	0.00
Radiography:	414.00	IGSCC Detection:	0.00	Nozzle Inner Radius:	0.00

	NES EXPERIENCE Months	PREVIOUS EXPERIENCE Months	TOTAL EXPERIENCE Months	CERTIFICATION RESTRICTIONS
Magnetic Particle:	0.72	4.00	4.72	Unrestricted
Penetrant:	0.71	3.00	3.71	Unrestricted
Radiography:	0.00	0.00	0.00	
Ultrasonics:	5.00	0.00	5.00	L1 - None; L2 - Thickness
Visual:	0.00	0.00	0.00	

DATE OF CURRENT CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			03-02-92	
Penetrant			03-02-92	
Radiography				
Ultrasonics	03-10-92	02-03-93	02-03-93	
Visual				

DATE OF EXPIRATION

	Trainee	I	II	III
Magnetic Particle			02-19-95	
Penetrant			02-20-95	
Radiography				
Ultrasonics	02-19-95	02-19-95	09-03-95	
Visual				

IGSCC Detection (Manual) _____ _____

IGSCC Sizing (Manual) _____ _____

Weld Overlay (Manual) _____ _____

Nozzle Inner Radius Qualification _____

PREVIOUS EMPLOYMENT INITIAL CERTIFICATION

	Trainee	I	II	III
Magnetic Particle				
Penetrant				
Radiography				
Ultrasonics				
Visual				

DATE OF INITIAL NES CERTIFICATION

	Trainee	I	II	III
Magnetic Particle			03-02-92	
Penetrant			03-02-92	
Radiography				
Ultrasonics	03-10-92	02-03-93	02-03-93	
Visual				

IGSCC Detection _____ _____

IGSCC Sizing _____ _____

Weld Overlay _____ _____

All certifications and supporting documentation are contained in this individual's certification file.

Mary-Ellen Alling
Technical Director's Designee

7-28-93
Date

Nondestructive Examination

NAME: Steven P. Hollum

EDUCATION AND TRAINING RECORD

Page: 1 of 1

EDUCATION

High School Graduate Canby High School Canby, Minnesota	Date Completed: 06-01-78	Nondestructive Testing Hutchinson Vo-Tech Institute Hutchinson, Minnesota	DEGREE: AAS Completed: 05-26-88	Education credited toward NDE certifications: 4 years

NDE CLASSROOM TRAINING

	INSTITUTION/ORGANIZATION	LOCATION	TYPE	PROCEDURE NUMBER	DATE COMPLETED	HOURS
MT	Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	N/A	05-26-88	116.00

Total this page: 116.00
TOTAL: 116.00

PT	Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	N/A	05-26-88	106.00

Total this page: 106.00
TOTAL: 106.00

RT	Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	N/A	05-26-88	414.00

Total this page: 414.00
TOTAL: 414.00

UT	Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	N/A	05-26-88	406.00

Total this page: 406.00
TOTAL: 406.00

IGSCC Detection Hrs: 0.00 IGSCC Sizing Hrs: 0.00 Weld Overlay Hrs: 0.00 Nozzle Inner Radius Hrs: 0.00

VT	Hutchinson Vo-Tech	Hutchinson, Minnesota	Level I and II	N/A	05-26-88	60.00

Total this page: 60.00
TOTAL: 60.00

The education and training required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Alling
Technical Director's Designee

3-2-92
Date

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD DANBURY CONNECTICUT 06810 203 796-5000

Nondestructive Examination

NES EXPERIENCE RECORD

NAME: Steven P. Wollum

	NDE ASSIGNMENTS List assignments in which the individual was working in the capacity for which he was certified.	EXPERIENCE AT EACH LEVEL OF CERTIFICATION FROM	TO	LEVEL	TYPE	MONTHS
MT	ISI: Callaway	03-21-92	04-19-92	II	Nuclear	0.15
	ISI: Shearon Harris	08-24-92	11-20-92	II	Nuclear	0.40
	ISI: Oyster Creek	11-20-92	12-26-92	II	Nuclear	0.07
	ISI: Wolf Creek	03-08-93	03-24-93	II	Nuclear	0.10
					Total this page:	0.72
					TOTAL:	0.72
PT	ISI: Callaway	03-21-92	04-19-92	II	Nuclear	0.15
	ISI: Shearon Harris	08-24-92	11-20-92	II	Nuclear	0.11
	ISI: Oyster Creek	11-20-92	12-26-92	II	Nuclear	0.14
	ISI: Wolf Creek	03-08-93	03-24-93	II	Nuclear	0.31
					Total this page:	0.71
					TOTAL:	0.71
RT						
					TOTAL:	0.00
UT	ISI: Arkansas Nuclear One	03-10-92	03-16-92	Trainee	Nuclear	0.80
	ISI: Callaway	03-21-92	04-19-92	Trainee	Nuclear	1.44
	ISI: Shearon Harris	08-24-92	09-25-92	I	Nuclear	1.01
	ISI: Shearon Harris	09-25-92	11-20-92	I/II-T	Nuclear	1.27
	ISI: Wolf Creek	03-08-93	03-24-93	I/II-T	Nuclear	0.48
					Total this page:	5.00
					TOTAL:	5.00
VT						
					TOTAL:	0.00

The NES experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Mary-Ellen Allen
Technical Director's Designee

6-8-93
Date

PREVIOUS EXPERIENCE RECORD

Nondestructive Examination

NAME: Steven P Wallum

Page 1 of 1

	EMPLOYER	LOCATION	TYPE	FROM	TO	MONTHS	LEVEL
MT	Twin City Testing	St Paul, Minnesota	Non-nuclear	09-15-88	03-10-89	1.00	II

Total this page: 1.00
TOTAL: 1.00

PT	Twin City Testing	St. Paul, Minnesota	Non-nuclear	09-15-88	03-10-89	3.00	II

Total this page: 3.00
TOTAL: 3.00

RT

TOTAL: 0.00

UT

TOTAL: 0.00

VT

TOTAL: 0.00

* Denotes non-continuous experience.
The previous experience required for certification is documented in this individual's certification file in accordance with NES Document 80A9068 and/or 80A9069.

Technical Director's Designee

12-04-92
Date

Resume for
Steven P. Wollum

EDUCATION

1986-1988 - Technical Institute of Hutchinson, Hutchinson, Minnesota - Diploma, Nondestructive Testing
Canby Area Vocational-Technical Institute, Canby, Minnesota - Diploma
1978 - Canby High School, Canby, Minnesota - High School Diploma

EXPERIENCE

03/10/92 to Present — **NUCLEAR ENERGY SERVICES, INC.**
Danbury, Connecticut

03/21/92 to 04/18/92 — Callaway - NDE Examiner, certified Level II MT and PT and UT Trainee.

03/10/92 to 03/16/92 — Arkansas Nuclear One - NDE Examiner, certified Level II MT and PT and UT Trainee. Performed Ultrasonic examinations.

09/15/88 to 02/10/89 — **TWIN CITY TESTING**
St. Paul, Minnesota

Inspector - Ensured manufactured products met standards set by ASTM-MIL-ANSI codes and specifications. Supervised building inspection of Minneapolis Convention Center. Inspected projects on- and off-site.

SIEMENS

PERSONAL RESUME PROFILE

NAME: Yousuf A. Khan **SOCIAL SECURITY #:** 099-64-9683

FORMAL EDUCATION: University of Karachi (Pakistan) - B. S. Degree in Physics, 1967.

ADDITIONAL TRAINING: See Below

TRAINING COURSE	HOURS	DATE	EMPLOYER/SCHOOL
Advanced Industrial Radiography Training	200	04/68	Atomic Energy Centre
UT, MT, PT	120 EA.	07/68	Vitosonics Ltd., England
UT IGSCC Detection	64	06/88	EPRI
Radiation Safety	40	11/81	Tech/Ops, Burlington, MA
RT, UT, PT	40 EA.		Alliance Tool Corp.
P-Scan Operator Training/Rev. 1	160	02/90	Universal Testing Laboratories
Operator UT Manipulator/ Manipulator Operating Procedures Training	90	03/90	Siemens
Phased Array Ultrasonics Testing Training	272	09/90	Universal Testing Laboratories

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

NAME: Yousuf A. Khan **SOCIAL SECURITY #:** 099-64-9683

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
05/16/88	Present	RT, UT Level III RSO Phased Array UT	Siemens Power Corporation 12/01/92 - 12/22/92 Assigned to GPUN Oyster Creek Plant for Phased Array Ultrasonic inspections of four FW and one CRDRL nozzles in accordance with NUREG 0619. Duties included job preparation, design and manufacturing of all robotic tooling to realize the automated ultrasonic inspection. Also provided UT Lead Level III support. 04/20/92 - 04/30/92 Assigned to H.B. Robinson, Hartsville, SC to perform automated ultrasonic examinations. 02/22/91 - 02/28/91 Assigned to Oyster Creek Nuclear Station. 10/10/90 - 11/17/90 Assigned to Cleveland Electric Illuminating, Perry Nuclear Plant for CEI - UT examination utilizing phased array technology on seven (7) nozzles, in accordance with ASME XI, Reg Guide 1.150 and NUREG 0619. Duties included job preparation and scheduling; preparation of inspection parameters and data collection and check for acceptance. 05/16/88 - 10/09/90 Assigned to Corporate Offices as Radiation Safety Officer.

NAME: Yousuf A. Khan **SOCIAL SECURITY #:** 099-64-9683

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			Responsible for the functional operation of the Radiation Safety Program and the management of the technical and administrative tasks encompassing the program. Responsible for the training and certification of RT personnel. Part of the team responsible for Americanization of Phased Array UT Technology. Developed procedure for Phased Array UT of BWR F/W Nozzles at Oyster Creek and Perry I. Developed scan plans and other nozzle specific data required for Phased Array examination of BWR F/W Nozzles at Oyster Creek and Perry.
04/13/88	05/15/88		Employment Change
04/08/86	04/12/88	UT, PT, Examiner Level III MIL-STD-2132 (Navy Nuclear)	Monroe Forgings Rochester, NY - Supervision and manual performance of ultrasonic, dye-penetrant and visual inspection of high temperature alloy forgings, in three different stages: in-process, as-forged and machines. Components manufactured for civil and military aircraft engines and nuclear submarines.
10/85	04/86		Unemployed

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Yousuf A. Khan **SOCIAL SECURITY #:** 099-64-9683

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
08/81	10/85	RT, PT, UT Level II	Alliance Tool Corporation Radiographics both X-ray and Gamma Ray. Ultrasonic, both contact and immersion, in addition to dye penetrant inspection of a wide variety of weldments, castings and forgings.
01/81	08/81		Immigration
04/74	01/81		Karachi Gas Company, Inc. Karachi, Pakistan - Managed the construction and nondestructive inspection of natural gas distribution mains, in both urban and rural areas.
07/15/69	04/74	RT, UT, MT, PT, Hydraulic Testing	Suparco Karachi, Pakistan - Performed and supervised radiographic, ultrasonic, magnetic, hydraulic and dye tests of weather rocket components.
02/21/68	05/31/69	RT, MT, UT, PT	Inspection & Reclamation Services, Inc. West Wharf Karachi, Pakistan - Performed RT, MT, PT, UT and gas pipeline and ships in dry docks.

The employee signature for original resume is on file.

Sandra K. Dewhitt
Siemens Power Corporation

8/10/93
Date

SIEMENS

NDE QUALIFICATION RECORD

__ Initial Certification X Recertification

NAME: Yousuf A. Kahn SOCIAL SECURITY NUMBER: 099-64-9683

METHOD: Ultrasonics CERTIFICATION LEVEL: Level III

CERTIFICATION DATE: April 13, 1992 EXPIRATION DATE: August 4, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

BASIC	METHOD	SPECIFIC	COMPOSITE
DATE 08/05/91	DATE 04/13/92	DATE 04/13/92	92.4%
SCORE 97.7%	SCORE 88.0%	SCORE 94.2%	
[.33]*	[.33]*	[.33]*	

*Percentile Weight

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____

Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

SIEMENS

SPECIALIZED NDE QUALIFICATION ENDORSEMENT

___ Initial Certification _X_ Recertification

NAME: Yousuf A. Kahn SOCIAL SECURITY NUMBER: 099-64-9683

METHOD: P-Scan Data Acquisition and Analysis

CERTIFICATION LEVEL II CERTIFICATION DATE 09/10/93 EXPIRATION DATE 09/09/96

EXAMINATION RESULTS:

SPECIFIC	PRACTICAL
DATE 09/10/93	DATE 09/10/93
PERCENT 90.0%	PERCENT 89.0%

NOTE: *No percentile weight factor is used to determine an endorsement. The only requirement is a minimum of 80% on both the specific and practical examinations.*

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____

Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel. (615) 499-0961
Fax: (615) 894-2456

SIEMENS

NDE CERTIFICATION RECORD

____ Initial Certification (SNPS) X Recertification

NAME: Yousuf A. Khan SOCIAL SECURITY NUMBER: 099-64-9683

METHOD: Radiography CERTIFICATION LEVEL: Level III

CERTIFICATION DATE: August 5, 1991 EXPIRATION DATE: June 12, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

BASIC	METHOD	SPECIFIC	COMPOSITE
DATE 08/05/91	DATE 06/13/91	DATE 06/13/91	
SCORE 97.7%	SCORE 83.0% *	SCORE 89.0% *	89.9%

COMMENTS:

* Exams administered by Hellier Associates, Inc.

EDUCATION, EXPERIENCE AND TRAINING:

The SNPS Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SNPS's Chattanooga office and may be reviewed or audited by appropriate indivdiuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Nuclear Power Services, Inc. certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SNPS-QAP-02.6 and is hereby certified to the level listed.

Dan K. Perry
Quality Assurance, Manager

Jeffery L. Landrum
Manager, Training & Certification

RT-101

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531 Chattanooga, TN 37421 TEL: (615) 499-0961 FAX (615) 894-2456

CERTIFICATE OF EYE EXAMINATION

NAME Yousaf, Khan SOCIAL SECURITY NUMBER 099-64-9683

EXAMINATION DATE 8/10/93

EXAMINATION CONDUCTED SHALL INCLUDE THE FOLLOWING:

NEAR DISTANCE ACUITY J-1+

Acceptable Yes [✓] No [ ] *Natural or corrected near distance acuity in at least one eye to J-1 at not less than 12 inches (30.5 cm). Ortho Rater number ten (10) test pattern shall also be acceptable.*

Corrective Lenses Required Yes [✓] No [ ]

FAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ] *Natural or corrected far distance acuity in at least one eye to Titmus Snellen test equivalent of 20/30.*

Corrective Lenses Required Yes [✓] No [ ]

COLOR VISION

Acceptable Yes [✓] No [ ] *Satisfactory color vision as demonstrated by Ishihara Test patterns or equivalent.*

Marty Massengale
Examiner's Signature

8/10/93
Date

MARTY MASSENGALE
Examiner's Name (Please Print)

PLEASE RETURN TO:

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

REVISED 07/18/91

SIEMENS

PERSONAL RESUME PROFILE

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

FORMAL EDUCATION: University of Tennessee - Business Administration, 1974-1975; Cleveland State Community College - Business Administration, 1969-1971; Ooltewah High School, Ooltewah, TN - Diploma, 1967

ADDITIONAL TRAINING: See Below

TRAINING COURSE	HOURS	DATE	EMPLOYER/SCHOOL
UT I	21	12/74	Combustion Engineering
UT II	21	06/75	Combustion Engineering
PT I	4	05/75	Combustion Engineering
PT II	6	05/76	Combustion Engineering
MT II	40	03/84	TVA
MT II	32	12/86	TVA
PT II	36	11/83	TVA
PT II	32	10/86	TVA
VT II	24	06/87	TVA
VT II	36	05/87	TVA
VT II	56	05/84	TVA
UT II	80	11/83	TVA
UT II	32	12/83	TVA
UT II	48	12/86	TVA
QA/QC Mechanical	88	02/84	TVA
Q/C General Training	30.5	09/87	TVA
UT IGSCC Detection	40	04/84	EPRI NDE Center
UT Weld Overlay	32	05/86	EPRI NDE Center
UT IGSCC Sizing	40	02/89	EPRI NDE Center
Contract Management	16	05/89	Bechtel Construction, Inc.
Reactor/Vessel Visual	2	10/89	Universal Testing Laboratories
Rees Camera System	8	10/89	Rees Instruments, Inc.
UT CGWT	8	09/87	TVA
Visual Examination	7	10/89	Universal Testing Laboratories
P-Scan Operator Training/Rev. 1	160	02/90	Universal Testing Laboratories
UT Manipulator Operator/Operating Procedure Set up Training	102	03/90	Siemens
Phased Array Ultrasonic Testing	280	09/90	Universal Testing Laboratories
UT - P-Scan System	40	06/91	Swain NDT Technology Center
MT II	2	12/91	Siemens Nuclear Power Services, Inc.
PT II	2	12/91	Siemens Nuclear Power Services, Inc.
UT II	4	12/91	Siemens Nuclear Power Services, Inc.
P-Scan - Specific	4	04/92	Siemens Nuclear Power Services, Inc.

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
08/02/88	Present	UT, MT, PT Level II UT IGSCC Detect. UT IGSCC Overlay UT Level IIA	Siemens Power Corporation NDE Technician assigned to the Chattanooga, Tennessee Office. 11/30/92 - 12/22/92 Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT on feedwater and CRDU nozzles using the phased array UT system. Duties included establishing inspection parameters using the 3D modeling program for nozzle inspections (CATS); data collection and check for acceptance. Documentation of final report, and performance of NRC requested TGC verification. 04/20/92 - 04/30/92 Assigned to H. B. Robinson, Hartsville, SC to perform automated ultrasonic examinations. 05/05/91 HRD Reactor located in Karlstein, Germany. Performed phased array examination on the "F" and "S" nozzles to detect thermal fatigue cracks located in the inner radius (area 1) area of the nozzles. Performed analysis to locate and size all defects. 02/21/91 - 03/03/91 Assigned to GPU Nuclear Oyster Creek Nuclear Plant to perform data acquisition. Performed phased array examinations on CRDR nozzle. 10/10/90 - 11/19/90 Assigned to Cleveland Electric Illuminating, Perry Nuclear Plant for UT examination utilizing phased array

NAME: James E. Smedley SOCIAL SECURITY #: 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION

technology on seven (7) nozzles, in accordance with ASME XI, Reg Guide 1.150 and NUREG 0619. Duties included establishing procedure for job; Preparation of inspection parameters using the 3D modeling program for nozzle examination (CATS); Data collection and check for acceptance; Data evaluation on site; Documentation of final report on MacIntosh computer.

10/18/89 - 10/25/89
Furnas - Angra Nuclear Power Plant - Section XI VT examination on RPV upper internals utilizing remote underwater equipment.

06/16/89 - 07/10/89
Ringhals Nuclear Power Plant - Performed UT on reactor coolant narrow groove welds, main steam, feedwater, and instrumentation lines during steam generator replacement utilizing USD-10 ultrasonic instrument.

03/27/89 - 03/31/89
04/03/89 - 04/07/89
Utility Power Corp. - Grand Gulf - KWU Turbine work - MT and PT. Approximately 49 hrs.

02/08/89 - 02/12/89
Assigned to CP & L Corporation, Brunswick Steam Electrical Plant. Performed UT evaluation on overlay reactor vessel/recir. safe end of IGSCC indications, utilizing mechanized scanner and USD-10 UT instrument.

12/7/88 - 12/15/88
Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT

NAME: James E. Smedley SOCIAL SECURITY #: 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			evaluation on reactor vessel/recir. safe end indications utilizing the L-SAFT system. 11/14/88 - 11/23/88 Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT on feedwater nozzles using the phased array UT system and mechanized inspection system. 10/10/88 - 10/28/88 Assigned to GPU Nuclear Corporation, Oyster Creek I. Performed UT on reactor vessel/feedwater safe ends using USD-10. 9/19/88 - 10/1/88 Assigned to South Carolina Electric and Gas Company, V. C. Summer Unit 1. NDE Technician. Performed Section XI visual examinations. 8/28/88 - 9/9/88 Assigned to Niagara Mohawk Power Corporation, Nine Mile Point Unit 1. Performed UT document review.
05/07/88	08/01/88		Unemployed
04/29/88	05/06/88	UT, PT Level II	Combustion Engineering NDE Field Inspector - Assigned to Penelec Utility, Keystone 1 Appalachian Power Corporation, Louisa, KY - Performed UT and MT on hot reheat piping systems.
04/18/88	04/28/88		Unemployed

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
03/27/88	04/17/88	UT, PT Level II	Combustion Engineering NDE Field Inspector. Utilized PT and UT on high energy piping systems.
11/26/87	03/26/88		Unemployed
05/83	11/25/87	See Description	Tennessee Valley Authority Nondestructive Testing Inspector. Supervisor of ten to fifteen inspectors. Liaison between the NRC and ANI. Lead responsibility for review of Watts Bar Nuclear Plant pre-service data. Conducted initial training and operation of Virginia Corporation at Richmond automated ultrasonic testing at Browns Ferry Nuclear Plant, Unit 2 for detection of IGSCC. Training Coordinator of nondestructive examination classes through TVA Nuclear Training Branch. Gave pre-certification nondestructive examination classes to trainees. Performed UT on PPV closure head bolts. Level II - Electric Power Research Institute, Charlotte, NC for detection of Intergranular Stress Corrosion Cracking (IGSCC). Level II - Electric Power Research Institute, Charlotte, NC for Detection of Intergranular Stress Corrosion Cracking through Overlay. Level II - Tennessee Valley Authority for ultrasonic testing.

NAME: James E. Smedley SOCIAL SECURITY #: 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			Level II - Tennessee Valley Authority for liquid penetrant testing. Level II - Tennessee Valley Authority for magnetic particle testing. Level II - Tennessee Valley Authority for visual Section XI. Turbine Experience: MT on turbine diaphragms at Brown's Ferry NPS (June 1983) - 2 days Underwater Visual: Underwater visual at Brown's Ferry Nuclear Plant (Novemb er 1985)
10/02/82	05/11/83		Unemployed
1974	10/01/82	PT, MT, UT Level II	Combustion Engineering Inspector for Quality Control. Nondestructive and dimensional examinations of components for fossil fuel and nuclear power systems. performed inspection of nuclear waste containers. Served as liaison between manufacturing and contract inspectors and DCAS (government inspectors). Qualifications: Level II of ASNT Navy Nuclear Penetrant Testing. Level II of ASNT Magnetic Particle Testing, Spark Testing and Boroscope. Familiarity with reading x-ray films.

NAME: James E. Smedley **SOCIAL SECURITY #:** 410-80-6112

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
1975	1980	UT Level II	Industrial Laboratories (PART-TIME) Level II ASNT Consultant. Ultrasonic examination of various metal components; i.e., structural steel for bridges for Mississippi Valley Steel, steam dry rollers for Lucey Boiler, steam dry rollers for Tennessee Paper Mills and machine wheel drums for Dodge, Inc.

The employee signature for original resume is on file.

Sandra K. Dewhitt
Siemens Power Corporation

8/10/93
Date

SIEMENS

NDE QUALIFICATION RECORD

__ Initial Certification X Recertification

NAME: James E. Smedley SOCIAL SECURITY NUMBER: 410-80-6112

METHOD: Ultrasonics CERTIFICATION LEVEL: Level II

CERTIFICATION DATE: December 17, 1991 EXPIRATION DATE: December 3, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

GENERAL	SPECIFIC	PRACTICAL	COMPOSITE
DATE 12/04/91	DATE 12/04/91	DATE 12/17/91	95.1%
SCORE 92.5%	SCORE 100.0%	SCORE 93.0%	
[.3]*	[.3]*	[.4]*	

*Percentile Weight

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____

Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax (615) 894-2456

SIEMENS

SPECIALIZED NDE QUALIFICATION ENDORSEMENT

___ **Initial Certification** __X__ **Recertification**

NAME: James E. Smedley SOCIAL SECURITY NUMBER: 410-80-6112

METHOD: P-Scan Data Acquisition and Analysis

CERTIFICATION LEVEL II CERTIFICATION DATE 09/10/93 EXPIRATION DATE 9/09/96

EXAMINATION RESULTS:

SPECIFIC	PRACTICAL
DATE 09/10/93	DATE 09/10/93
PERCENT 90.0%	PERCENT 95.0%

NOTE: *No percentile weight factor is used to determine an endorsement. The only requirement is a minimum of 80% on both the specific and practical examinations.*

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-026 and is hereby certified to the level listed.

Certified by _____
Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

CERTIFICATE OF EYE EXAMINATION

NAME James Sandlin SOCIAL SECURITY NUMBER 410-44-6110

EXAMINATION DATE 11-11-92

EXAMINATION CONDUCTED SHALL INCLUDE THE FOLLOWING:

NEAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ]

Natural or corrected near distance acuity in at least one eye to J-1 at not less than 12 inches (30.5 cm). Ortho Rater number ten (10) test pattern shall also be acceptable.

Jaeger 1+

Corrective Lenses Required Yes [✓] No [ ]

FAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ]

Natural or corrected far distance acuity in at least one eye to Titmus Snellen test equivalent of 20/30.

Corrective Lenses Required Yes [ ] No [✓]

COLOR VISION

Acceptable Yes [✓] No [ ]

Satisfactory color vision as demonstrated by Ishihara Test patterns or equivalent.

Gloria J Statt R.T. 11-11-92

Examiner's Signature Date

Gloria J Statt, R.T.

Examiner's Name (Please Print)

PLEASE RETURN TO:

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

REVISED 07/16/91

SIEMENS

PERSONAL RESUME PROFILE

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

FORMAL EDUCATION: University of Tennessee, Knoxville, TN - 1969 - 1972;
Tennessee Wesleyan College, Athens, TN - 1972;
Hiwassee College, Madisonville, TN - Summer, 1970

ADDITIONAL TRAINING: See Below

TRAINING COURSE	HOURS	DATE	EMPLOYER/SCHOOL
UT I & II	152	08/85	TVA
UT IGSCC Detection	32	08/84	TVA
UT IGSCC Detection	64	10/86	TVA
RT MINAC IGSCC	40	08/86	EPRI
UT IGSCC Sizing	40	02/89	EPRI
UT IGSCC Sizing	32	02/91	EPRI
UT Weld Overlay Training	32	08/90	EPRI
UT I Nozzle Inner Rad	14		Nuclear Energy Services
PT I & II	74	05/87	TVA
MT I & II	56	03/85	TVA
RT I	40	03/85	TVA
VT Section XI	104	07/84	TVA
Intro to NDE	40		TVA
Visual Welding Inspection	40	04/84	TVA
RT	16	03/86	TVA
RT (MINAC Radiography)	32		Arnold Engineering
Mechanical	40	12/84	TVA
QC	30.5	08/87	TVA
USD-10	24	10/87	TVA
Contract Management	16	05/89	Bechtel Construction, Inc.
P-Scan Training	160	11/89	Universal Testing Laboratories
Rees Camera System	8	10/89	Rees Instruments, Inc.
IGSCC Detection Manual/P-Scan	160	02/91	Universal Testing Laboratories
VT 1-4	4	05/91	Universal Testing Laboratories
UT	2	09/91	Siemens Nuclear Power Services
Phased Array Ultrasonic Testing	80	12/91	Siemens Nuclear Power Services

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
01/16/89	Present	MT, PT, UT, VT-1 Level II UT Level IIA	Siemens Power Corporation 11/04/92 - 01/15/93 Assigned to Taiwan Power Company as shift leader for P-Scan automated ultrasonic system. Responsible for all activities associated with the P-Scan system, including final analysis for data collected. Also responsible for all manual ultrasonic review. 03/08/92 - 05/08/92 Assigned to Perry Nuclear Plant as day shift leader for the P-Scan automated system. Responsible for all activities associated with the P-Scan system including personnel work assignments, craft support and all coordination with plant management to assure compliance with work activities and schedules. Also responsible for data collection and preliminary analysis with the P-Scan. 02/23/92 - 02/28/92 Assigned to North Anna Nuclear Plant. Performed ultrasonic testing for steam generator replacement. 10/06/91 - 11/08/91 Assigned to Hatch Nuclear Plant to perform automated ultrasonic examination utilizing P-Scan for detection of IGSCC in piping and pipe overlays, and manual IGSCC sizing. 08/04/91 - 08/12/91 Assigned to Kernkraftwerk Leibstadt AG Nuclear Plant, Switzerland - Sized crack on recirculation system piping.

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION

05/16/91 - 06/01/91
Assigned to Pilgrim Nuclear Power Plant to perform visual examination, utilizing pipe crawler, on service water system.

03/24/91 - 04/19/91
Assigned to Plant Hatch, Southern Company Services to perform UT examinations on nozzle welds utilizing P-Scan automated equipment.

02/22/91 - 03/10/91
Assigned to Oyster Creek Nuclear Station.

09/04/90 - 11/14/90
Assigned to Cleveland Electric Illuminating Co., Perry Nuclear Plant. Performed MT, PT and UT examinations on various piping systems, RPV head and nozzles in the plant. Most of the examinations were concentrated on nozzle examinations utilizing the P-Scan automated system.

05/07/90 - 05/17/90
Supported KWU during the TVO refueling outage in Ol Killioto, Finland. Performed automated (P-Scan) ultrasonic examinations on circumferential and meridional welds on the reactor pressure vessel head. Performed fluorescent MT of RPV circumferential weld.

03/27/90 - 04/06/90
Assigned to Utility Power Corp. to perform UT, PT and MT on turbine at Waterford I.

02/11/90 - 03/10/90
Certification on P-Scan System at EPRI; IGSCC Sizing and Weld Overlay.

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
			11/12/89 - 11/16/89 Certification on P-Scan system at EPRI; IGSCC Detection. 08/14/89 -08/18/89 Assigned to Gaithersburg, MD office to compose technical descriptions of NDE for bid proposals. 07/17/89 - 07/21/89 Assigned to Utility Power Corporation - Comanche Peak to perform PT. 05/21/89 - 05/25/89 Florida Power Corporation - Performed UT and MT at Higgins and Bartow Power Plants. 04/03/89 - 04/07/89 and 03/27/89 - 03/31/89 Utility Power Corporation, Grand Gulf - KWU turbine work MT and PT. 02/14/89 - 02/22/89 Assigned to Pepco to perform UT examinations at Morgantown Plant.
11/28/88	01/12/89	UT IGSCC Level II	Nuclear Energy Services Nine Mile I, Niagara Mohawk Power Corp. - Performed IGSCC UT inspection on piping and components.
11/09/88	11/27/88		Unemployed
10/03/88	11/08/88	UT Level II IGSCC	Universal Testing Laboratories, Inc. Assigned to South Carolina Electric & Gas, VC Summer Nuclear Power Plant - Performed IGSCC detection.

PERSONAL RESUME PROFILE (CONTINUED)

NAME: Philip G. Shamblin **SOCIAL SECURITY #:** 408-90-9339

WORK EXPERIENCE RECORD

FROM	TO	QUAL LVL	EMPLOYER/JOB DESCRIPTION
08/05/88	10/02/88		Unemployed
01/27/88	08/04/88	UT Level II IGSCC	Nuclear Energy Services Nine Mile II, Niagara Mohawk Power Corp. Performed ultrasonics on plant piping and components.
11/26/87	01/26/88		Unemployed
12/20/83	11/25/87	UT, VT, PT, MT, RT Level II	Tennessee Valley Authority Division of Nuclear Power, Chattanooga, TN Performed nondestructive examinations on nuclear related components. Worked and coordinated activities of NDE inspection in order to perform examinations required to assure absence of generic problems that have an impact on the plant operation. This includes verification that qualification of personnel, equipment and procedures are in all types of NDE work to conform to NRC requirements.
12/82	12/83		Ted Russell Ford Knoxville, TN - Salesman
12/72	12/82		Shamblin Appliance & Furniture Co. Madisonville, TN - Owner - Sales, Service

The employee signature for original resume is on file.

Sandra K. Merriott
Siemens Power Corporation

8/10/93
Date

SIEMENS

NDE QUALIFICATION RECORD

__ Initial Certification X Recertification

NAME: Philip G. Shamblin SOCIAL SECURITY NUMBER: 408-90-9339

METHOD: Ultrasonics CERTIFICATION LEVEL: Level II

CERTIFICATION DATE: September 4, 1991 EXPIRATION DATE: August 29, 1994

LIMITATIONS: None

EXAMINATION RESULTS:

GENERAL	SPECIFIC	PRACTICAL	COMPOSITE
DATE 08/30/91	DATE 09/04/91	DATE 09/04/91	92.8%
SCORE 97.5%	SCORE 96.0%	SCORE 85.0%	
[.3]*	[.3]*	[.4]*	

*Percentile Weight

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-02.6 and is hereby certified to the level listed.

Certified by _____

Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax (615) 894-2456

SIEMENS

SPECIALIZED NDE QUALIFICATION ENDORSEMENT

___ Initial Certification X Recertification

NAME: Philip G. Shamblin SOCIAL SECURITY NUMBER: 408-90-9339

METHOD: P-Scan Data Acquisition and Analysis

CERTIFICATION LEVEL II CERTIFICATION DATE 09/10/93 EXPIRATION DATE 09/09/96

EXAMINATION RESULTS:

SPECIFIC	PRACTICAL
DATE 09/10/93	DATE 09/10/93
PERCENT 100%	PERCENT 94%

NOTE: *No percentile weight factor is used to determine an endorsement. The only requirement is a minimum of 80% on both the specific and practical examinations.*

EDUCATION, EXPERIENCE AND TRAINING:

The SPC Personal Resume Profile summarizes this individuals records of education, experience and training. These records are maintained on file at SPC's Chattanooga office and may be reviewed or audited by appropriate individuals as requested in writing and/or by appointment.

CERTIFICATION STATEMENT:

Siemens Power Corporation certifies that the above named individual has satisfactorily met the requirements listed in the current revision of Procedure No. SPC-QAP-026 and is hereby certified to the level listed.

Certified by _____
Michael H. Dalichow
Plant Services Primary NDE Level III

Siemens Power Corporation

Nuclear Division
Reactor Services & Systems

5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

Tel: (615) 499-0961
Fax: (615) 894-2456

CERTIFICATE OF EYE EXAMINATION

NAME Philip SHANBLIN SOCIAL SECURITY NUMBER 408-90-9339

EXAMINATION DATE 10/12/92

EXAMINATION CONDUCTED SHALL INCLUDE THE FOLLOWING:

NEAR DISTANCE ACUITY

Acceptable Yes [✓] No [ ]

Natural or corrected near distance acuity in at least one eye to J-1 at not less than 12 inches (30.5 cm). Ortho Rater number ten (10) test pattern shall also be acceptable.

Corrective Lenses Required Yes [ ] No [✓]

FAR DISTANCE ACUITY

cceptable Yes [✓] No [ ]

Natural or corrected far distance acuity in at least one eye to Titmus Snellen test equivalent of 20/30.

Corrective Lenses Required Yes [ ] No [✓]

COLOR VISION

Acceptable Yes [✓] No [ ]

Satisfactory color vision as demonstrated by Ishihara Test patterns or equivalent.

[signature]
Examiner's Signature

10/12/92
Date

DR GEOFFREY C ROFF
Examiner's Name (Please Print)

PLEASE RETURN TO:

Siemens Nuclear Power Services, Inc.
5959 Shallowford Road, Suite 531
Chattanooga, TN 37421

REVISED 07/08/91

H. B. ROBINSON
UNIT 2

INTERVAL 3, PERIOD 1, OUTAGE 2
(REFUEL OUTAGE 15)

INSERVICE INSPECTION

FINAL REPORT

BOOK 3 OF 3

Prepared for
Carolina Power and Light Company

NES

44 SHELTER ROCK ROAD
DANBURY, CT 06810–7089
(203) 796–5200

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1217

LIQUID PENETRANT EXAMINATION PROCEDURE

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9/2/93

Expiration Date 3/1/94

RECOMMENDED BY: _____ 8/26/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 26Aug93
Manager / Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 29	0

LIQUID PENETRANT EXAMINATION PROCEDURE

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

Project Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	GENERAL MGR.	
0	Scott Larson	2/20/92	2/20/92	2/20/92	
1					
2					
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REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6101

PAGE 2 OF 26

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL

FORM # NES 206 3/90

LIQUID PENETRANT EXAMINATION

1. PURPOSE

1.1 The purpose of this procedure is to establish the requirements for Liquid Penetrant (PT) examination and to describe the techniques for Visible and Fluorescent examination of welds and components of all sizes in non porous material requiring surface examination.

2. SCOPE

2.1 This procedure incorporates the methodology and requirements of the Codes and Standards referenced in Section 3.0. This document describes the techniques necessary to conduct PT examinations using Visible and Fluorescent, Solvent removable and Water Washable PT testing methods.

2.2 This procedure meets the requirements of the referenced documents to the extent specified in this procedure. When project specifications invoke or modify these requirements, the project specifications shall govern. These project requirements may be addended to this procedure as necessary.

3. REFERENCES

3.1 ASME B & PV Code Section III. Edition as applicable.

3.2 ASME B & PV Code Section V 1986 Edition.

3.3 ASME B & PV Code, Section XI. 1986 Edition.

3.4 80A9068, NES Procedure for Certifying Nondestructive examination Personnel. Latest Revision.

3.5 83A0283, NES Procedure "PSI/ISI Examination Areas and Volumes.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with reference 3.4

4.2 A copy of each examiner's certification summary and eye test shall be made available to the plant owner or his agent prior to performing examinations to this procedure.

4.3 A copy of each examiner's certification summary, and eye test shall be maintained on site.

4.4 Interpretation of examination results shall be conducted by personnel with a minimum certification of Level II PT.

5. SAFETY PRECAUTIONS

NOTE: This procedure may involve hazardous materials, operations, and equipment. The procedure does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to observe good safety and health practices.

5.1 Personnel should avoid standing on wet or damp surfaces while operating equipment electrical equipment (e.g. UV Lamp).

5.2 UV filtering glasses should be worn when conducting fluorescent PT.

5.3 Eye protection should be worn during examinations.

5.4 Some examination media may cause skin irritation. Precautions should be taken to avoid prolonged skin contact.

5.5 Examinations should be conducted in well ventilated areas.

5.6 Smoking while performing PT examinations is prohibited.

6. DEFINITIONS

6.1 Area of Interest – Area of part or component on which surface examinations will be conducted.

Discontinuity – An interruption in the physical structure of a part. It may be intentional or unintentional.

Indication – Evidence of a discontinuity that requires interpretation to determine its significance

Interpretation – The determination whether indications are relevant or nonrelevant.

Nonrelevant indications – An indication caused by a condition that is not related to a discontinuity.

Recordable indication – Any relevant indication.

7. EQUIPMENT & MATERIAL REQUIREMENTS

7.1 The following equipment is required as necessary:

a) Clean white lint–free cloth or absorbent paper
b) Applicable illumination (UV,Flashlight or other)
c) Thermometer
d) Timer or watch
e) 18% Neutral gray card
f) Calibrated UV light meter (as applicable)
g) Hose(s), valve(s), pressure gage, appropriate for water–wash technique (as applicable)

7.2 The following materials or their equivalent are approved for use:

NOTE: Magnaflux SKC–NF/ZC–7B Cleaner may be used with all of the following:

Color Contrast Solvent Removable:

a) Magnaflux SKL–HF Penetrant
b) Magnaflux SKD–NF Developer

Color Contrast Water Washable:

a) Magnaflux SKL–WP Water Washable Penetrant
b) Magnaflux SKD–NF Developer (non–aqueous)
c) Magnaflux ZP5B Developer (aqueous)

Fluorescent:

a) Magnaflux ZL–67 Water Washable Penetrant
b) Magnaflux ZP–9F Developer (non–aqueous)
c) Magnaflux ZP5B Developer (aqueous)

NOTE: The mixing of penetrant "families" is prohibited. Site approved cleaners may be used as precleaning and post cleaning agents, but not as a substitute for the cleaner material required during the examination process.

8. GENERAL PREREQUISITES

8.1 EXAMINATION ITEM(S)

8.1.1 The components to be examined shall be identified/determined by the plant owner.

8.1.2 The component shall be prepared for examination by the plant owner, i.e. the examination surface shall be free of foreign matter which may interfere with the examination. See paragraph 8.5

8.2 MATERIALS CERTIFICATION

8.2.1 Each batch of materials referenced in 7.2 shall have been tested for residual amounts of Halogen and Sulfur in accordance with ASME B & PV Code Section V and its referenced documents. The amounts of Sulfur, and Chlorine plus Fluorine shall not exceed 1% of the residue, by weight. Certification of the above test results shall be submitted to the plant owner.

8.3 LIGHTING

8.3.1 Light intensity shall be verified as follows:

a) Color Contrast

Color Contrast PT indications can be inspected in either natural or artificial white light. Adequate illumination is required to ensure that there is no loss of the sensitivity during the inspection. The ability to resolve a 1/32 inch wide line on an 18% neutral gray card placed on or near the examination surface is proof of "adequate illumination".

b) Fluorescent

Inspect fluorescent PT indications in a darkened area. The intensity of UV or "black" lighting shall be measured using a suitable black light meter. The recommended minimum intensity at the examination surface is 800uW/cm2.

The intensity shall be verified at least once after the light has been allowed to warm up, and once every consecutive eight hours during operation. (A four hourly check is recommended).

NOTE: The UV lamp should be left on. Turning it off and on severely reduces the life of the bulb.

8.3.2 The inspector shall remain in the darkened area for at least 5 minutes prior to conducting the inspection. This will enable the eyes to adapt to the darkened condition. If the examiner wears glasses or contact lenses they shall not be photosensitive.

8.4 EXAMINATION AREAS

The area to be examined shall be as follows unless otherwise specified in a referencing code or standard:

a) Welds The weld area and at least 1/2" on all sides as measured from the weld edge.
b) Weld Preps The bevel area and at least 1/2" on all sides.
c) Other Components The areas of concern
d) For ASME Section XI examinations, the examination areas shall be as specified for the particular component. (See Reference 3.5)

8.5 SURFACE CONDITIONS

8.5.1 Satisfactory results can usually be obtained on surfaces in the as–welded, as–rolled, as–cast or as–forged conditions. However, where surface irregularities could mask relevant indications, surface preparation may be accomplished by manual wire brushing, grinding or machining.

8.5.2 Prior to liquid penetrant examination, the surface(s) to be examined and all adjacent areas within 1 inch shall be dry and free of all dirt, grease, lint, scale, welding flux and spatter, oil or other extraneous matter that would interfere with the examination. Additionally, the surface area(s) to be examined shall be free of paint.

8.5.3 The examiner shall notify the NES "lead individual" or other designated contact when surface preparation of areas to be examined is not suitable for the penetrant examination.

NOTE: Metal removing process such as those mentioned in 8.4 above could decrease the effectiveness of the PT examination by smearing the metal surfaces and filling discontinuities that may be open to the surface. Special care should be taken when preparing a surface in this manner. If in doubt, a PT Level III should be consulted.

8.6 SURFACE TEMPERATURE REQUIREMENTS

The temperature of the PT chemicals and examination surface shall not be below 60°F or above 125°F throughout the examination. Local Heating or cooling is permitted, provided that the temperature remains within the above mentioned range.

Where it is not practical to comply with this requirement, other temperature ranges may be used provided that:

a) The procedure is qualified as specified in Ref. 3.2.
b) The qualification is documented on a PT Data Sheet (Exhibit 1) and a copy of this is attached to this procedure.
c) Where required, the qualification should be demonstrated to the owner or Authorized Inspector. If not required, the qualification shall be conducted or witnessed by a PT Level III.

8.7 TECHNIQUE APPLICATION RESTRICTIONS

8.7.1 Fluorescent penetrant examination shall not follow a color contrast penetrant examination.

8.7.2 The examiner shall notify the NES "lead individual" or other designated contact when such a condition has happened or is about to happen.

9. PROCEDURE

9.1 SOLVENT REMOVABLE

The following general processing procedures apply to both the Color Contrast and the Fluorescent penetrant inspection methods:

9.1.1 Precleaning

a) The area of interest and adjacent surfaces within one inch shall be cleaned with the approved cleaning solvent listed in 7.2 . The cleaning shall be performed by heavy swabbing with lint free cloths or absorbent paper that has been saturated with the approved cleaner. Spraying the cleaner directly onto the part is allowed during the precleaning operation, if necessary. After final cleaning, the surface

shall be checked using a clean white lint free cloth or paper towel to confirm that the surface is clean.

b) The clean surface shall be allowed to dry by normal evaporation for a minimum of five minutes, or by forced warm air from a blower. The temperature of the examination surface shall not be allowed to exceed 125°F (compressed air shall not be used).

9.1.2 Penetrant Application

a) After the area has been cleaned, dried and cooled (if necessary) to within the allowable temperature range, the examination area shall be thoroughly coated with the penetrant. The penetrant shall be applied by brushing, dipping or spraying with aerosol spray cans. Application by brushing is an effective way to avoid aerosol "overspray" onto and subsequent clean–up of non–examination areas.

NOTE: Be sure to test compatibility of the brush bristles and the penetrant prior to production examination use.

b) The areas shall remain wetted with the penetrant for a minimum of fifteen minutes (Dwell time). Any areas that become dry or areas where the penetrant withdraws leaving uncoated surfaces, shall be recleaned and the penetrant reapplied.

9.1.3 Penetrant Removal

After the required dwell time, the excess penetrant shall be removed as follows:

a) Remove as much penetrant as possible with clean, dry lint free cloths or absorbent paper until most traces of penetrant have been removed. If penetrant has adhered to the surface, the examination area shall be recleaned and the penetrant reapplied.

b) Lightly moisten with solvent, the lint free material and wipe the surface until the remaining traces of penetrant material have been removed.

NOTE: To minimize removal of penetrant from discontinuities, take care to avoid the use of excess solvent. Flushing the surface with solvent following the application of the penetrant and prior to developing is prohibited.

c) After removal of the excess penetrant, the surface shall be allowed to dry by normal evaporation for a minimum of five minutes before applying the developer.

9.1.4 Developer Application

a) While the part is being allowed to dry, agitate the aerosol can to ensure that the developer is consistent.

b) After allowing the surface to dry, a thin coating of developer shall be uniformly applied.

NOTE: Insufficient coating thickness may not draw the penetrant out from potential discontinuities. Heavy coatings of developer may mask fine indications.

c) The developer shall be allowed to dry for a minimum of seven minutes before interpretation. Interpretation shall be completed within thirty minutes after application. If the examination surface is sufficiently large to preclude complete examination within the prescribed time, the surface shall be examined in increments that allow compliance with the above time frames.

NOTE: The surface shall be closely observed during the application of the developer in order to monitor the behavior of indications that tend to bleed–out profusely.

9.1.5 Post Examination Cleaning

The developer is best removed in its dry state with the use of a soft dry brush, cloth or paper towel. The solvent cleaner described in 7.2 can then be applied. All remaining traces of developer shall be removed.

9.1.6 Remove penetrant materials which have "oversprayed" onto adjacent, non–examination surfaces, where applicable.

9.2 WATER WASHABLE

9.2.1 The precleaning, penetrant application and dwell time shall be as described in section 9.1. Penetrant removal shall be as follows:

a) Water washable penetrant materials can be removed directly from the examination area with water rinsing. The degree and speed of removal will

depend on such processing parameters as water pressure, water temperature and duration of the rinse cycle. Therefore it is important that the water–rinsing operation be controlled.

b) Water pressure should be constant and shall not exceed 50 psi. 30 psi is an average recommended value.

c) A coarse spray is generally recommended.

e) Maintain the temperature of the rinse water within the range of 60°F – 110°F

f) The duration of the rinse cycle shall be sufficient to eliminate any background that will interfere with interpretation. This duration shall be determined initially on a test part, and shall be documented on the examination data sheet.

NOTE: Avoid over–rinsing. Excessive rinsing can cause the penetrant to be washed out of discontinuities.

g) For Fluorescent water washable penetrant examinations, the rinsing shall take place in the darkened area under the UV lamp so that adequate removal can be determined.

9.2.2 Drying

a) The part shall be dry prior to the application of the developer (unless aqueous developer is used, in which case it may be applied immediately after the rinse cycle).

b) After the rinse, the part shall be thoroughly dried using the lint free material. Hot air may be used or the part may be dried by exposure to ambient temperature. The temperature of the examination surface shall not be allowed to exceed 125°F (compressed air shall not be used).

c) Drying time will vary depending on air temperature. The examination surface can be considered dry when all traces of dampness have disappeared.

9.2.3 Developer Application

a) Agitate the aerosol can to ensure that the developer is consistent.

b) Aqueous developers may be applied to the examination surface prior to drying. Exercise caution when applying a wet developer in order to avoid possible loss of indications.

c) Non–aqueous developer shall be applied after allowing the surface to dry. A thin coating of developer shall be uniformly sprayed over the examination surface.

NOTE: Insufficient coating thickness may not draw the penetrant out from potential discontinuities. Heavy coatings of developer may mask fine indications.

d) Aqueous developer should be allowed to air dry, or may be dried using forced hot air. The temperature requirements of 9.2.1.e shall apply.

e) Developing time begins immediately after the developer has dried.

NOTE: Precautions shall be taken to prevent any object from touching the dry developer film. It is easily damaged. When questionable results are obtained, the surfaces should be re–examined.

9.2.4 Interpretation of Indications

a) Interpretation shall be completed within thirty minutes after developer application. If the examination surface is sufficiently large to preclude complete examination within the prescribed time, the surface shall be examined in increments that allow compliance with the above time frames.

NOTE: The surface shall be closely observed during the application of the developer in order to monitor the behavior of indications that tend to bleed–out profusely.

b) Surface discontinuities are indicated by bleed–out of the penetrant which is normally a deep red color that stains the developer (color contrast) or a bright fluorescent green / yellow color when viewed under the influence of a UV lamp.

9.2.5 False indications

a) Color Contrast

Indications with a light pink color may indicate excessive cleaning. Inadequate cleaning may leave an excessive background making interpretation difficult.

Broad areas of pigmentation which could mask indications of discontinuities are unacceptable. Where this condition exists, the affected examination areas shall be cleaned and re–examined.

b) Fluorescent

The most common source of false indications is poor washing or cleaning after removal of the penetrant material from the surface. This condition will normally show up background fluorescence. Where this is noted, the examination areas affected shall be cleaned and re–examined. Lint and hairs can easily be mistaken for real indications.

9.2.6 Post Examination Cleaning

The developer is best removed in its dry state with the use of a soft brush, cloth or paper towel. The solvent cleaner described in 7.2 can then be applied. All remaining traces of developer shall be removed.

10. RECORDING/REPORTING/EVALUATION

NOTE: Adequate illumination is required to assure sensitivity during the examination and evaluation of indications. (See 8.3)

10.1 When there is profuse bleed–out, the initial size of this indication shall be noted, as well as the final bleed–out size. Instances where bleed–out from two or more discontinuities merge, these shall also be noted.

10.2 Localized surface irregularities from machining or handling or other surface conditions may produce nonrelevant indications. The nonrelevant indications that may mask relevant indications shall be recorded and recommended for rework of the surface followed by re–examination.

NOTE: If re–examination reveals any indications, at the direction of the plant owner, resurfacing shall be continued or these indications shall be regarded as relevant until otherwise established.

10.3 All relevant indications shall be reported by recording on the Liquid Penetrant Examination data sheet (Exhibit 1), and shall include:

- size (i.e., dimensions) of indication(s)
- shape of indication(s)
- location(s) on test part or the examination area(s)
- orientation
- sketch or photograph

When project or other specifications modify the Code requirements, the modified specifications shall govern.

10.4 All relevant indications recorded on the Liquid Penetrant Examination data sheet shall be evaluated by comparison with the applicable acceptance standards (Section 12) of the referencing Code section or other specification to which the examination relates. When project or other applicable written specifications modify the Code requirements, the modified specifications shall govern.

11. EXAMINATION RECORDS

11.1 A Liquid Penetrant Data Sheet (Exhibit 1) shall be completed for each examination unless otherwise required. The information recorded shall include the following:

a) Date of Examination
b) Identification of item examined
c) Identification of product
d) Brand name and type of penetrant materials used
e) Batch number of all penetrant materials
f) All processing times (e.g. Dwell time etc.)
g) Developing time before evaluation
h) All relevant indications to be shown by sketch or photograph or described with respect to a convenient datum point on the component or surface being examined, and to the extent specified in 10.3.

i) Any area(s) of the test part or examination zone not examined due to physical access limitations or other reasons.

j) The signature and certification Level of the examiner

k) Other information as required

11.2 Record Retention

NES record retention responsibility shall be limited to the time until the final report is transmitted.

12. ATTACHMENTS

12.1 Exhibit 1 Liquid Penetrant Data Sheet

12.2 Attachment A ASME B&PV Code Section XI, 1986 Edition

12.3 ASME B&PV Code Section III, Division 1 All editions and addenda from 1974 through Winter 1982.

12.4 Attachment B Examination of pressure retaining material and product form.

12.5 Attachment C Examination of weld–edge preparation surfaces.

12.6 Attachment D Examination of welds, areas of welds prepared for repair and repaired welds.

12.7 Attachment E ASME B&PV Code Section III, Division 2 All editions and addenda from 1974 through Winter 1982.

DATA SHEET NO. _____
THERMOMETER S/N _____
TEMPERATURE _____ ° F
NOMINAL THICKNESS ___ INCHES
MATERIAL _____
CLASS _____

LIQUID PENETRANT EXAMINATION

PROCEDURE _____
REVISION ____ F.C. NO. ____
PAGE _____ OF _____

SYSTEM EXAMINED _____ ISO/DWG/SK. # _____ REVISION _____

DATUM POINT REFERENCE _____

_____

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER				MINUTES
PENETRANT				MINUTES
REMOVER				MINUTES
DEVELOPER				MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.

EXAMINER _____ LEVEL _____ DATE _____
EXAMINER _____ LEVEL _____ DATE _____
REVIEWER _____ LEVEL _____ DATE _____
REVIEWER _____ DATE _____
REVIEWER _____ DATE _____

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

EXHIBIT 1

ATTACHMENT A
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code Section XI
1986 Edition

Activity: Preservice and inservice inspections of nuclear power plant components.

Acceptance Criteria:

A. Linear surface flaws detected by surface examination methods shall be considered as a single linear indication provided the separation distance between indications is equal to or less than the dimension "S", where "S" is determined as shown in Figure A–1.

B. The overall length "Q" of a single and discontinuous surface indication shall be determined as shown in Figure A–1.

C. Where an indication extends beyond the surface examination boundaries, or separate linear indications lie both within and beyond the boundaries but are characterized as a single indication by Figure A–1, the overall indication indication size shall be compared with the applicable standards.

D. **Reactor Vessel**

Nominal Section Thickness, (T) inches	Allowable Linear Indication Length, (l), l/T, %
2 1/2	17.4
4 through 12	10.4
16	8.0

E. **Nozzle to Shell/Head (Class II only)**

Nominal Section Thickness, 2t, inches	Allowable Linear Flaw Length, (l), in.
5 1/2	3/16
2 1/2	1/4
≥ 4	3/8

F. Piping Welds

1. Austenitic Steels

Preservice

Nominal Section Thickness, (T) inches	Allowable Linear Indication Length, (l), inches
0.312 or less	1/8
1.0	3/16
2.0	1/4
3.0 and over	1/4

Inservice

0.312 or less	0.2
1.0	0.25
2.0	0.45
3.0 and over	0.65

2. Ferritic Steels

Preservice

Nominal Section Thickness, (T) inches	Allowable Linear Indication Length, (l), inches
less than 0.312	1/16
0.312	1/8
1.0	1/4
2.0	1/4
3.0	1/4
4.0	1/4

Inservice

less than 0.312	3/16
0.312	3/16
1.0	5/16
2.0	5/8
3.0	7/8
4.0	7/8

G. Dissimilar Metal Welds

In the case of dissimilar metal welds the Austenitic side of the weld is governed by Paragraph F.1 and the Ferritic side of the weld is governed by Paragraph F.2.

H. Pump Casings and Valve Bodies

1. Ferritic Material

Preservice

Nominal Wall Thickness, (T) inches	Surface Indication Length, (l), inches
2.0	1/4
3.0	1/4
4.0	1/4
5.0	1/4
6.0 and over	1/4

Inservice

2.0	0.3
3.0	0.45
4.0	0.6
5.0	0.75
6.0 and over	0.9

2. Austenitic Material

Preservice

Nominal Wall Thickness, (T) inches	Surface Indication Length, (l), inches
2.0	1/4
3.0 and over	1/4

Inservice

2.0	0.3
3.0 and over	0.45

3. Base material indications in castings that are permitted by the governing material specifications and accepted under the rules of ASME B&PV Code Section III are allowable.

I. Integral Attachments for Piping, Valves, Pumps and Vessels

1. The size of allowable indications shall not exceed the allowable indication standards of the applicable supported pressure retaining component to which the integral attachment is welded.

2. Laminar type indications found by the Liquid Penetrant method shall be examined by U.T. and acceptance based on the laminar acceptance standards of the supported pressure retaining component, unless otherwise directed by the Plant Owner.

J. Pressure Retaining Welds in Control Rod Drive Housings

The sizes of allowable indications shall not exceed:

1. 3/16" for preservice examination

2. 1/4" for inservice examination

K. Pressure retaining Bolting and Studs

The size of allowable indications shall not exceed:

1. nonaxial indications; 1/4 inch in length

2. axial indications; 1 inch in length

L. Notes pertaining to Paragraphs D, E, F and H

1. "T" is the nominal wall thickness or the actual wall thickness as determined by U.T. examination. If actual wall thickness is used as a basis for acceptance of an indication, note as such on this data sheet.

2. For intermediate nominal wall thicknesses, linear interpolation is permissible.

3. At the Plant Owner's request, if indications on the outer surface of components reference in Paragraphs E, F, H and I detected by the Liquid Penetrant Examination method during an "Inservice" Examination exceed the allowable standards, the indications may be examined by the volumetric method. The acceptance of these indications shall be governed by the allowable indication standards for the volumetric examination method.

ATTACHMENT B
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 1
All Editions and Addenda from 1974 through 1986

Activity: Examination of pressure–retaining material and product form (i.e., "base material").

Acceptance Criteria: NB–2000, NC–2000, ND–2000, NE–2000

A. Only indications with major dimensions greater than 1/16 in. shall be considered relevant.

B. The following relevant indications are unacceptable:

(1) Any linear indications greater than 1/16 in. long for materials less than 5/8 in. thick, greater than 1/8 in. long for materials from 5/8 in. thick to under 2 in. thick and 3/16 in. long for materials 2 in. thick and greater;

(2) Rounded indications with dimensions greater than 1/8 in. for thickness less than 5/8 in. and greater than 3/16 in. for thicknesses 5/8 in. and greater;

(3) Four or more indications in a line separated by 1/16 in. or less edge to edge;

(4) Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

Note: Relevant indications are those which result from unacceptable mechanical discontinuities. Linear indications are those indications in which the length is equal to or greater than three times the width. Rounded indications are indications which are circular or elliptical with length less than three times the width.

ATTACHMENT C
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 1
All Editions and Addenda from 1974 through 1986

Activity: Examination of weld–edge preparation surfaces.

Acceptance Criteria: NB–5000, NC–5000

A. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

B. Laminar–type discontinuities are acceptable if they do not exceed 1 inch in length.

Note: The extent of all laminar–type indications exceeding 1 inch in length shall be determined by ultrasonic examination.

C. Other nonlaminar relevant indications which are unacceptable:

(1) Any linear indication greater than 3/16 inch long;

(2) Rounded indications with dimensions greater than 3/16 inch;

(3) Four or more indications, in a line separated by 1/16 inch or less, edge–to–edge.

ATTACHMENT D
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 1
All Editions and Addenda from 1974 through 1986

Activity: Examination of welds, areas of welds prepared for repair and repaired welds.

Acceptance Criteria: NB–5350, NC–5350, ND–5350, NE–5350*, NF–5350, NG–5350

A. Unless otherwise specified, the following relevant indications are unacceptable:

(1) Any cracks or linear indications

(2) Rounded indications with dimensions greater than 3/16 inch;

(3) Four or more rounded indications in a line separated by 1/16 inch or less, edge–to–edge;

(4) Ten or more rounded indications in any 6 square inches of surface with the major dimension of this area not to exceed 6 inches with the area taken in the most unfavorable location relative to the indications being evaluated.

*B. Indications with major dimensions greater than 1/16 inch shall be considered relevant and evaluated according to the applicable acceptance criteria.

Note: Linear indications are those indications in which the length is more than three times the width. Rounded indications are circular or elliptical with length less than three times the width. Relevant indications are those which result from mechanical discontinuities.

* For examination to Article NE–5350, (B) above does not apply.

ATTACHMENT E
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 2
All Editions and Addenda from 1974 through 1986

Activity: Examination of welds in all liner thicknesses.

Acceptance Criteria: CC–5000

A. Unless otherwise specified, the following relevant indications are unacceptable:

(1) Any cracks or linear indications

(2) Rounded indications with dimensions greater than 3/16 in. (4.8 mm)

(3) Four or more rounded indications in a line separated by 1/16 inch (1.6 mm) or less edge–to–edge

(4) Ten or more rounded indications in any 6 sq. in. (3870 mm) of surface with the major dimension of this area not to exceed 6 in. (152 mm) with the area taken in the most unfavorable location relative to the indications being evaluated.

B. Relevant indications are those which result from unacceptable mechanical discontinuities.

Note: Linear indications are those indications in which the length is more than three times the width. Rounded indications are indications which are circular or elliptical with the length less than three times the width.

ATTACHMENT F
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Divisions 1 & 2
All Editions and Addenda from 1974 through 1986

Activity: Examination of welds, areas of welds prepared for repair and repaired welds.

Acceptance Criteria:

Unless otherwise specified the following criteria applies:

All surfaces required to be examined shall be free of:

C. Relevant linear indications,

D. Four or more rounded indications in a line separated by 1/16 inch or less (edge–to–edge) except where the specifications for the material established different requirements for acceptance so far as defects are concerned.

E. Relevant rounded indications greater than 3/16 inch.

Notes:

(1) Relevant indications are those which result from mechanical discontinuities. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

(2) Linear indications are those indications in which the length is more than three times the width.

(3) Rounded indications are indications which are circular or elliptical with the length less than three times the width.

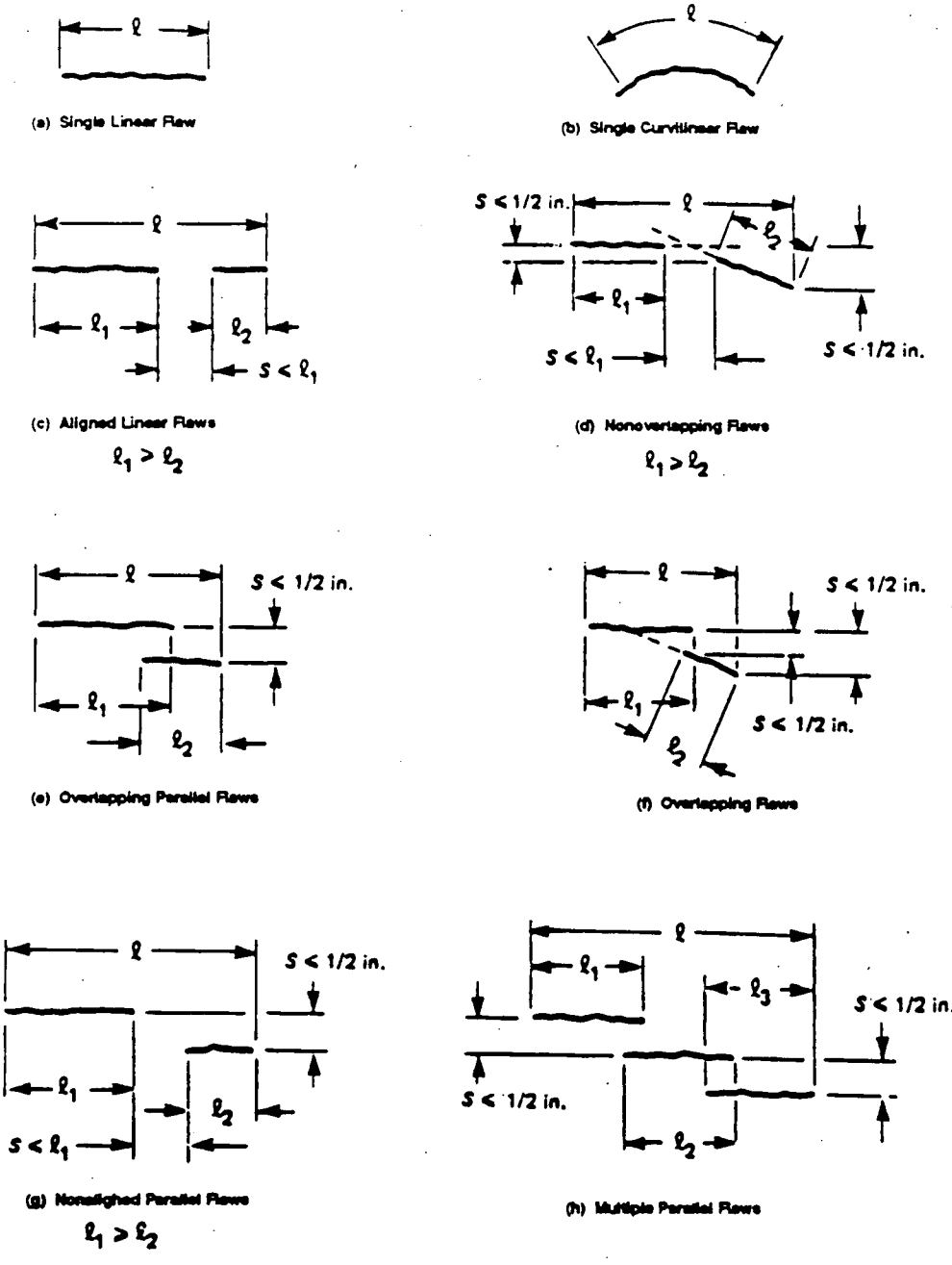

FIGURE A-1
LINEAR SURFACE INDICATIONS

Illustrative Flaw Configurations and Determination of Length

13.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

ATTACHMENT 6.1
Page 1 of 3

DOCUMENT CHANGE FORM

DCF # 93-1350
New Rev
Temp. # 4024
Temp Change Expires 10-1-93

Section I

Doc Kind SP # 1217 Affected Rev 0

Alternate ID 83AG101 Rev. 0 Markup Attached? ✓ yes ___ no

Document Title Liquid Penetrant Examination Procedure

Rev Basis Corrects Typographical Error and adds a Penetrant material approved by CP&L.

Due Date/Prerequisite for Performance of ISI Exams.

Initiator Richard B. Weber Group Tech. Support-ISI Date 9/16/93

Section II

Pages Revised 5 and 7 of 29

Doc Type Code ___ Applic System/File #s 14506

Description of Change ① Changed paragraph 3.5 to read: 83AG091 instead of 83AO283 for Areas & Volumes
② Added Subparagraph c) under "Color Contrast Solvent Removable": to read: "c) Magnaflux SKL-SP Penetrant."

Reason/Justification ① Corrects Typo and ② adds penetrant material that is approved by CP&L and demonstrated to the ANII for NDE purposes.

(Attach Additional Paper If Required)

DOCUMENT CHANGE FORM

Section II (cont.)

Affected Documents

Kind	Number	Title
N/A	N/A	N/A

Comments None

Document Released For Review

Preparer Richard B. Walker Group Tech Support - ISI Date 9/16/93

Recommender [signature] Title Mgr ISI Program Date 9/16/93

Recommended Effective Date

Training required before becoming effective? ___yes ✓no

description N/A

DOCUMENT CHANGE FORM

Section III

Type of Review	Req'd (See ATTACH 6.3)	Not Req'd	Assigned Reviewer	Reviewer's Signa/Date (per ATTACHMENT 6.4)
1. Design Verification		✓	See Design Verification Package	
2. Technical				
3. Nuclear Safety	✓		See Safety Review Package	
4a. 10CFR50 App. R			See App. R Review Form	
4b. SBO			See SBO Review Form	
5a. Environmental Qual.				
5b. R.G. 1.97				
6. PNSC				
7. NAD				
			____ Review done, Ref.	
8. NRC			____ Review may follow approval Permission to proceed, Ref.	
			(per Reg. Comp., signa/date	
9. In-Service Inspec.				
10. System/Compon. Engrg				
11a. Operations				
11b. Human Factors				
12. Simulator				
13. Maint-Elec/I&C				
14. Maint-Mech/Insul				
15. Installation				
16. E&RC				
17. ALARA				
18. Security				
19. Fire Protection				
20. Config. Control				
21. Emerg. Preparedness				
22. Project Coordinator				
23. Checker				
24. Other _____				
25. Other _____				
26. Other _____				

Temporary Change Approval: A temporary change has a maximum duration of 21 days.

Signature	Management Title	Date
	HGR SUS SRO	9/16/93
	SRO	9/16/93

Final Approval _____ _____ PNSC followup review recommended [ ]
Signature Date

Void/Cancel _____ _____
Signature Date

Reason: _____

Section IV

Appropriate actions have been taken regarding these temporary changes to allow thi
Revision to become effective. _____ (list)

_____
Recommender Signature/Date

SAFETY REVIEW COVER SHEET

DOCUMENT NO. SP-1217 REV. NO. 0

DESCRIPTION OR TITLE: Liquid Penetrant Examination Procedure

1. Assigned Responsibilities:

   Safety Analysis Preparer: Richard B. Weber

   Lead 1st Safety Reviewer: _____

   2nd Safety Reviewer: _____

2. Safety Analysis Preparer: Complete PART I, SAFETY ANALYSIS

   Safety Analysis Preparer Richard B. Weber / 9/16/93
   SIGNATURE DATE

3. Lead 1st Safety Reviewer: Complete Part II, Item Classification.

4. Lead 1st Safety Reviewer: Part III may be completed. If either question 1 2 is "yes," then Part IV is not required.

5. Lead 1st Safety Reviewer: Determine which DISCIPLINES are required for rev of this item (including own) and mark the appropriate block(s) below.

DISCIPLINES Required:	(Print Name)	Signature/Date (Step
[] Nuclear Plant Operations		
[] Nuclear Engineering		
[] Mechanical		
[] Electrical		
[] Instrumentation & Control		
[] Structural		
[] Metallurgy		
[] Chemistry/Radiochemistry		
[] Health Physics		
[] Administrative Controls		

6. A QUALIFIED SAFETY REVIEWER will be assigned for each DISCIPLINE marked in step 5 and his/her name printed in the space provided. Each person listed shall perform a SAFETY REVIEW and provide input into the Safety Review Package.

7. The Lead 1st Safety Reviewer will assure that a Part III or Part IV is completed (see step 4 above) and a Part VI if required (see 9.d of Part I Each person listed in step 5 shall sign and date next to his/her name in 5, indicating completion of a SAFETY REVIEW.

8. 2nd Safety Reviewer: Perform a SAFETY REVIEW in accordance with Section

   2nd Safety Reviewer _____ Date _____

   DISCIPLINE: _____

9. PNSC review required? If "yes," attach Part V and mark reason below:

	Yes	N
[] Potential UNREVIEWED SAFETY QUESTION	[]	[
[] Question 9 of Part IV answered "Yes"		
[] Other (specify): _____		

10CFR50.59 PROGRAM MANUAL
ATTACHMENT A
CP&L SAFETY REVIEW PACKAGE

Page 2 of ___

PART I: SAFETY ANALYSIS
(See instructions in Section 8.4.1)
(Attach additional sheets as necessary.)

DOCUMENT NO. SP-1217 REV. NO. 0

DESCRIPTION OF CHANGE: ①Changed paragraph 3.5 to read: 83A6091 instead of 83A0283 for Areas and Volumes.
②Added subparagraph c) under "Color Contrast Solvent Removable": to read: "c) Magnaflux SKL-SP Penetrant."

ANALYSIS: This change only corrects ①the referenced procedure for Examination Areas and Volumes (Typo) to be examined and ②adds a penetrant material to the list of penetrants for use during IST examinations. The penetrant material added is SKL-SP by Magnaflux and is currently approved for use by CP&L and is in stock. These examinations are required by UFSAR, Tech. Specs. and ASME Section XI 1986 Edition. No changes to the UFSAR or Tech. Spec are required due to this change since they are administrative in nature.

REFERENCES:
UFSAR Section 3.9.3. and 6.6
Tech. Spec. Section 4.0
ASME Section XI 1986 Edition

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ATTACHMENT A
CP&L SAFETY REVIEW PACKAGE

Page ____ of ____

PART II: ITEM CLASSIFICATION

DOCUMENT NO. _____ REV. NO. _____

		Yes	No
1.	Does this item represent:		
	a. A change to the facility as described in the SAFETY ANALYSIS REPORT?	[]	[]
	b. A change to the procedures as described in the SAFETY ANALYSIS REPORT?	[]	[]
	c. A test or experiment not described in the SAFETY ANALYSIS REPORT?	[]	[]
2.	Does this item involve a change to the individual plant Operating License or to its Technical Specifications?	[]	[]
3.	Does this item require a revision to the FSAR?	[]	[]
4.	Does this item involve a change to the Off-Site Dose Calculation Manual?	[]	[]
5.	Does this item constitute a change to the Process Control Program?	[]	[]
6.	Does this item involve a major change to a Radwaste Treatment System?	[]	[]
7.	Does this item involve a change to the Technical Specification Equipment List (BSEP and SHNPP only)?	[]	[]
8.	Does this item impact the NPDES Permit (all 3 sites) or constitute an "unreviewed environmental question" (SHNPP Environmental Plan, Section 3.1) or a "significant environmental impact" (BSEP)?	[]	[]
9.	Does this item involve a change to a previously accepted:		
	a. Quality Assurance Program	[]	[]
	b. Security Plan (including Training, Qualification, and Contingency Plans)?	[]	[]
	c. Emergency Plan?	[]	[]
	d. Independent Spent Fuel Storage Installation license? (If "yes," refer to Section 8.4.2, "Question 9," for special considerations. Complete Part VI in accordance with Section 8.4.6)	[]	[]

SEE SECTION 8.4.2 FOR INSTRUCTIONS FOR EACH "YES" ANSWER.

REFERENCES. List FSAR and Technical Specification references used to answer questions 1-9 above. Identify specific reference sections used for any "Yes" answer.

_____

_____

_____

_____

_____

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Page ____ of ____

PART III: UNREVIEWED SAFETY QUESTION DETERMINATION SCREEN

DOCUMENT NO. _____ REV. NO. _____

	Yes	No
1. Is this change fully addressed by another completed UNREVIEWED SAFETY QUESTION determination? (See Sections 7.2.1, 7.2.2.5, and 7.9.1.1)	[]	[]

REFERENCE DOCUMENT: _____ REV. NO. _____

	Yes	No
2. For procedures, is the change a non-intent change which only (check all that apply): (See Section 7.2.2.3)	[]	[]

[] Corrects typographical errors which do not alter the meaning or intent of the procedure; or,

[] Adds or revises steps for clarification (provided they are consistent with the original purpose or applicability of the procedure); or,

[] Changes the title of an organizational position; or,

[] Changes names, addresses, or telephone numbers of persons; or,

[] Changes the designation of an item of equipment where the equipment is the same as the original equipment or is an authorized replacement; or,

[] Changes a specified tool or instrument to an equivalent substitute; or,

[] Changes the format of a procedure without altering the meaning, intent, or content; or

[] Deletes a part or all of a procedure, the deleted portions of which are wholly covered by approved plant procedures?

If the answer to either Question 1 or Question 2 in PART III is "Yes," then PAR need not be completed.

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ATTACHMENT A
CP&L SAFETY REVIEW PACKAGE

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PART IV: UNREVIEWED SAFETY QUESTION DETERMINATION

DOCUMENT NO. _____ REV. NO. _____

Using the SAFETY ANALYSIS developed for the change, test or experiment, as well a other required references (LICENSING BASIS DOCUMENTATION, Design Drawings, Design Basis Documents, codes, etc.), the preparer of the Unreviewed Safety Question Determination must directly answer each of the following seven questions and make determination of whether an UNREVIEWED SAFETY QUESTION exists.

A WRITTEN BASIS IS REQUIRED FOR EACH ANSWER

		Yes	No
1.	May the proposed activity increase the probability of occurrence of an accident evaluated previously in the SAFETY ANALYSIS REPORT?	[]	[]
2.	May the proposed activity increase the consequences of an accident evaluated previously in the SAFETY ANALYSIS REPORT?	[]	[]
3.	May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety evaluated previously in the SAFETY ANALYSIS REPORT?	[]	[]
4.	May the proposed activity increase the consequence of a malfunction of equipment important to safety evaluated previously in the SAFETY ANALYSIS REPORT?	[]	[]
5.	May the proposed activity create the possibility of an accident of a different type than any evaluated previously in the SAFETY ANALYSIS REPORT?	[]	[]

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PART IV: (Continued)

DOCUMENT NO. _____ REV. NO. ___-___

		Yes	No
6.	May the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any evaluated previously in the SAFETY ANALYSIS REPORT?	[]	[]
7.	Does the proposed activity reduce the margin of safety as defined in the basis of any Technical Specification?	[]	[]
8.	Based on the answers to questions 1 - 7, does this item result in an UNREVIEWED SAFETY QUESTION? If the answer to any of the questions 1-7 is "Yes," then the item is considered to constitute an UNREVIEWED SAFETY QUESTION.	[]	[]
9.	Is PNSC review required for any of the following reasons?	[]	[]

If, in answering question 1 or 3 "No," it was determined that the probabili increase was small relative to the uncertainties; or, in answering question or 4 "No," it was determined that the doses increased, but the dose was sti less than the NRC ACCEPTANCE LIMIT; or, in answering question 7 "No," a parameter would be closer to the NRC ACCEPTANCE LIMIT, but the end result w still within the NRC ACCEPTANCE LIMIT; then PNSC review is required.

REFERENCES:

This Unreviewed Safety Question Determination is for the following DISCIPLINE(s) (Additional Part IV forms may be included as appropriate.)

[] Nuclear Plant Operations
[] Nuclear Engineering
[] Mechanical
[] Electrical
[] Instrumentation & Control
[] Structural
[] Metallurgy
[] Chemistry/Radiochemistry
[] Health Physics
[] Administrative Controls

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PART V: PNSC REVIEW

DOCUMENT NO. _____ REV. NO. _____

Determination/Evaluation: _____

Action Taken: _____

Basis: _____

PNSC Chairman: _____ Date: _____

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ATTACHMENT A
CP&L SAFETY REVIEW PACKAGE Page ____ of ____

PART VI: ISFSI CHANGES (10CFR72.48)

DOCUMENT NO. _____ REV. NO. _____

		Yes	No
1.	Does this item represent:		
a.	A change to the Independent Spent Fuel Storage Installation (ISFSI) as described in the ISFSI Safety Analysis Report?	[]	[]
b.	A change to the procedures as described in the ISFSI Safety Analysis Report?	[]	[]
c.	A test or experiment not described in the ISFSI Safety Analysis Report?	[]	[]
2.	Does this item involve a change to the license conditions incorporated in the ISFSI Operating License?	[]	[]
3.	Does this item result in a significant increase in occupational exposure?	[]	[]
4.	Does this item result in a significant unreviewed environmental impact?	[]	[]

SEE SECTION 8.4.6 FOR INSTRUCTIONS FOR EACH "YES" ANSWER.

REFERENCES. List ISFSI SAR and Technical Specification references used to answe questions 1 and 2 above. Identify specific reference sections used for any "Yes answer.

LIQUID PENETRANT EXAMINATION

1. PURPOSE

1.1 The purpose of this procedure is to establish the requirements for Liquid Penetrant (PT) examination and to describe the techniques for Visible and Fluorescent examination of welds and components of all sizes in non porous material requiring surface examination.

2. SCOPE

2.1 This procedure incorporates the methodology and requirements of the Codes and Standards referenced in Section 3.0. This document describes the techniques necessary to conduct PT examinations using Visible and Fluorescent, Solvent removable and Water Washable PT testing methods.

2.2 This procedure meets the requirements of the referenced documents to the extent specified in this procedure. When project specifications invoke or modify these requirements, the project specifications shall govern. These project requirements may be addended to this procedure as necessary.

3. REFERENCES

3.1 ASME B & PV Code Section III. Edition as applicable.

3.2 ASME B & PV Code Section V 1986 Edition.

3.3 ASME B & PV Code, Section XI. 1986 Edition.

3.4 80A9068, NES Procedure for Certifying Nondestructive examination Personnel. Latest Revision.

3.5 ~~83A0283~~ 83A6091, NES Procedure "PSI/ISI Examination Areas and Volumes.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with reference 3.4

4.2 A copy of each examiner's certification summary and eye test shall be made available to the plant owner or his agent prior to performing examinations to this procedure.

T-A82A

7. EQUIPMENT & MATERIAL REQUIREMENTS

7.1 The following equipment is required as necessary:

a) Clean white lint–free cloth or absorbent paper
b) Applicable illumination (UV,Flashlight or other)
c) Thermometer
d) Timer or watch
e) 18% Neutral gray card
f) Calibrated UV light meter (as applicable)
g) Hose(s), valve(s), pressure gage, appropriate for water–wash technique (as applicable)

7.2 The following materials or their equivalent are approved for use:

NOTE: Magnaflux SKC–NF/ZC–7B Cleaner may be used with all of the following:

Color Contrast Solvent Removable:

a) Magnaflux SKL–HF Penetrant
b) Magnaflux SKD–NF Developer
c) Magnaflux SKL–SP Penetrant

Color Contrast Water Washable:

a) Magnaflux SKL–WP Water Washable Penetrant
b) Magnaflux SKD–NF Developer (non–aqueous)
c) Magnaflux ZP5B Developer (aqueous)

Fluorescent:

a) Magnaflux ZL–67 Water Washable Penetrant
b) Magnaflux ZP–9F Developer (non–aqueous)
c) Magnaflux ZP5B Developer (aqueous)

NOTE: The mixing of penetrant "families" is prohibited. Site approved cleaners may be used as precleaning and post cleaning agents, but not as a substitute for the cleaner material required during the examination process.

T–A83A

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1217

LIQUID PENETRANT EXAMINATION PROCEDURE

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 1

Effective Date 10/1/93

Expiration Date 3/1/94

RECOMMENDED BY: _____ 9/20/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 29SEPT93
Manager / Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	1
LEP	1
3 through 5	1
6	0
7	1
8 through 22	0
23 through 28	1
29	0

LIQUID PENETRANT EXAMINATION PROCEDURE

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

Project Application	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	GENERAL MGR.	
0	Scott Larson				
1	Scott Larson				
2	Scott Larson	09-23-93	09-23-93	09-23-93	
3					
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6101

PAGE 2 OF 26

REV. NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	7-19-93	3,5, 21 thru 26	Correct reference, material references and page numbers per CRA 8663.	
2	9-22-93	5	Para. 7.2 – allow use of additional cleaner Add Para. 7.2.C – allow use of additional penetrant per CRA 8717	

LIQUID PENETRANT EXAMINATION

1. PURPOSE

1.1 The purpose of this procedure is to establish the requirements for Liquid Penetrant (PT) examination and to describe the techniques for Visible and Fluorescent examination of welds and components of all sizes in non porous material requiring surface examination.

2. SCOPE

2.1 This procedure incorporates the methodology and requirements of the Codes and Standards referenced in Section 3.0. This document describes the techniques necessary to conduct PT examinations using Visible and Fluorescent, Solvent removable and Water Washable PT testing methods.

2.2 This procedure meets the requirements of the referenced documents to the extent specified in this procedure. When project specifications invoke or modify these requirements, the project specifications shall govern. These project requirements may be addended to this procedure as necessary.

3. REFERENCES

3.1 ASME B & PV Code Section III. Edition as applicable.

3.2 ASME B & PV Code Section V 1986 Edition.

3.3 ASME B & PV Code, Section XI. 1986 Edition.

3.4 80A9068, NES Procedure for Certifying Nondestructive examination Personnel. Latest Revision.

3.5 83A6091, NES Procedure "PSI/ISI Examination Areas and Volumes.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with reference 3.4

4.2 A copy of each examiner's certification summary and eye test shall be made available to the plant owner or his agent prior to performing examinations to this procedure.

4.3 A copy of each examiner's certification summary, and eye test shall be maintained on site.

4.4 Interpretation of examination results shall be conducted by personnel with a minimum certification of Level II PT.

5. SAFETY PRECAUTIONS

NOTE: This procedure may involve hazardous materials, operations, and equipment. The procedure does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to observe good safety and health practices.

5.1 Personnel should avoid standing on wet or damp surfaces while operating equipment electrical equipment (e.g. UV Lamp).

5.2 UV filtering glasses should be worn when conducting fluorescent PT.

5.3 Eye protection should be worn during examinations.

5.4 Some examination media may cause skin irritation. Precautions should be taken to avoid prolonged skin contact.

5.5 Examinations should be conducted in well ventilated areas.

5.6 Smoking while performing PT examinations is prohibited.

6. DEFINITIONS

6.1 Area of Interest – Area of part or component on which surface examinations will be conducted.

Discontinuity – An interruption in the physical structure of a part. It may be intentional or unintentional.

Indication – Evidence of a discontinuity that requires interpretation to determine its significance

Interpretation – The determination whether indications are relevant or nonrelevant.

Nonrelevant indications – An indication caused by a condition that is not related to a discontinuity.

Recordable indication – Any relevant indication.

7. EQUIPMENT & MATERIAL REQUIREMENTS

7.1 The following equipment is required as necessary:

a) Clean white lint–free cloth or absorbent paper
b) Applicable illumination (UV,Flashlight or other)
c) Thermometer
d) Timer or watch
e) 18% Neutral gray card
f) Calibrated UV light meter (as applicable)
g) Hose(s), valve(s), pressure gage, appropriate for water–wash technique (as applicable)

7.2 The following materials or their equivalent are approved for use:

NOTE: Magnaflux SKC–NF/ZC–7B or SKC–S Cleaner may be used with all of the following:

Color Contrast Solvent Removable:

a)	Magnaflux	SKL–HF	Penetrant
b)	Magnaflux	SKD–NF	Developer
c)	Magnaflux	SKL–SP	Penetrant

Color Contrast Water Washable:

Only site approved materials shall be used when performing Color Contrast Water Washable Penetrant examinations. Materials used must meet all site chemical, fire and safety requirements and shall have the approval of the CP&L PT Level III.

Fluorescent:

Only site approved materials shall be used when performing Fluorescent Penetrant examinations. Materials used must meet all site chemical, fire and safety requirements and shall have the approval of the CP&L PT Level III.

NOTE: The mixing of penetrant "families" is prohibited. Site approved cleaners may be used as precleaning and post cleaning agents, but not as a substitute for the cleaner material required during the examination process.

8. GENERAL PREREQUISITES

8.1 EXAMINATION ITEM(S)

8.1.1 The components to be examined shall be identified/determined by the plant owner.

8.1.2 The component shall be prepared for examination by the plant owner, i.e. the examination surface shall be free of foreign matter which may interfere with the examination. See paragraph 8.5

8.2 MATERIALS CERTIFICATION

8.2.1 Each batch of materials referenced in 7.2 shall have been tested for residual amounts of Halogen and Sulfur in accordance with ASME B & PV Code Section V and its referenced documents. The amounts of Sulfur, and Chlorine plus Fluorine shall not exceed 1% of the residue, by weight. Certification of the above test results shall be submitted to the plant owner.

8.3 LIGHTING

8.3.1 Light intensity shall be verified as follows:

a) Color Contrast

Color Contrast PT indications can be inspected in either natural or artificial white light. Adequate illumination is required to ensure that there is no loss of the sensitivity during the inspection. The ability to resolve a 1/32 inch wide line on an 18% neutral gray card placed on or near the examination surface is proof of "adequate illumination".

b) Fluorescent

Inspect fluorescent PT indications in a darkened area. The intensity of UV or "black" lighting shall be measured using a suitable black light meter. The recommended minimum intensity at the examination surface is 800uW/cm2.

The intensity shall be verified at least once after the light has been allowed to warm up, and once every consecutive eight hours during operation. (A four hourly check is recommended).

NOTE: The UV lamp should be left on. Turning it off and on severely reduces the life of the bulb.

8.3.2 The inspector shall remain in the darkened area for at least 5 minutes prior to conducting the inspection. This will enable the eyes to adapt to the darkened condition. If the examiner wears glasses or contact lenses they shall not be photosensitive.

8.4 EXAMINATION AREAS

The area to be examined shall be as follows unless otherwise specified in a referencing code or standard:

a) Welds The weld area and at least 1/2" on all sides as measured from the weld edge.
b) Weld Preps The bevel area and at least 1/2" on all sides.
c) Other Components The areas of concern
d) For ASME Section XI examinations, the examination areas shall be as specified for the particular component. (See Reference 3.5)

8.5 SURFACE CONDITIONS

8.5.1 Satisfactory results can usually be obtained on surfaces in the as–welded, as–rolled, as–cast or as–forged conditions. However, where surface irregularities could mask relevant indications, surface preparation may be accomplished by manual wire brushing, grinding or machining.

8.5.2 Prior to liquid penetrant examination, the surface(s) to be examined and all adjacent areas within 1 inch shall be dry and free of all dirt, grease, lint, scale, welding flux and spatter, oil or other extraneous matter that would interfere with the examination. Additionally, the surface area(s) to be examined shall be free of paint.

8.5.3 The examiner shall notify the NES "lead individual" or other designated contact when surface preparation of areas to be examined is not suitable for the penetrant examination.

NOTE: Metal removing process such as those mentioned in 8.4 above could decrease the effectiveness of the PT examination by smearing the metal surfaces and filling discontinuities that may be open to the surface. Special care should be taken when preparing a surface in this manner. If in doubt, a PT Level III should be consulted.

8.6 SURFACE TEMPERATURE REQUIREMENTS

The temperature of the PT chemicals and examination surface shall not be below 60°F or above 125°F throughout the examination. Local Heating or cooling is permitted, provided that the temperature remains within the above mentioned range.

Where it is not practical to comply with this requirement, other temperature ranges may be used provided that:

a) The procedure is qualified as specified in Ref. 3.2.
b) The qualification is documented on a PT Data Sheet (Exhibit 1) and a copy of this is attached to this procedure.
c) Where required, the qualification should be demonstrated to the owner or Authorized Inspector. If not required, the qualification shall be conducted or witnessed by a PT Level III.

8.7 TECHNIQUE APPLICATION RESTRICTIONS

8.7.1 Fluorescent penetrant examination shall not follow a color contrast penetrant examination.

8.7.2 The examiner shall notify the NES "lead individual" or other designated contact when such a condition has happened or is about to happen.

9. PROCEDURE

9.1 SOLVENT REMOVABLE

The following general processing procedures apply to both the Color Contrast and the Fluorescent penetrant inspection methods:

9.1.1 Precleaning

a) The area of interest and adjacent surfaces within one inch shall be cleaned with the approved cleaning solvent listed in 7.2 . The cleaning shall be performed by heavy swabbing with lint free cloths or absorbent paper that has been saturated with the approved cleaner. Spraying the cleaner directly onto the part is allowed during the precleaning operation, if necessary. After final cleaning, the surface

shall be checked using a clean white lint free cloth or paper towel to confirm that the surface is clean.

b) The clean surface shall be allowed to dry by normal evaporation for a minimum of five minutes, or by forced warm air from a blower. The temperature of the examination surface shall not be allowed to exceed 125°F (compressed air shall not be used).

9.1.2 Penetrant Application

a) After the area has been cleaned, dried and cooled (if necessary) to within the allowable temperature range, the examination area shall be thoroughly coated with the penetrant. The penetrant shall be applied by brushing, dipping or spraying with aerosol spray cans. Application by brushing is an effective way to avoid aerosol "overspray" onto and subsequent clean–up of non–examination areas.

NOTE: Be sure to test compatibility of the brush bristles and the penetrant prior to production examination use.

b) The areas shall remain wetted with the penetrant for a minimum of fifteen minutes (Dwell time). Any areas that become dry or areas where the penetrant withdraws leaving uncoated surfaces, shall be recleaned and the penetrant reapplied.

9.1.3 Penetrant Removal

After the required dwell time, the excess penetrant shall be removed as follows:

a) Remove as much penetrant as possible with clean, dry lint free cloths or absorbent paper until most traces of penetrant have been removed. If penetrant has adhered to the surface, the examination area shall be recleaned and the penetrant reapplied.

b) Lightly moisten with solvent, the lint free material and wipe the surface until the remaining traces of penetrant material have been removed.

NOTE: To minimize removal of penetrant from discontinuities, take care to avoid the use of excess solvent. Flushing the surface with solvent following the application of the penetrant and prior to developing is prohibited.

c) After removal of the excess penetrant, the surface shall be allowed to dry by normal evaporation for a minimum of five minutes before applying the developer.

9.1.4 Developer Application

a) While the part is being allowed to dry, agitate the aerosol can to ensure that the developer is consistent.

b) After allowing the surface to dry, a thin coating of developer shall be uniformly applied.

NOTE: Insufficient coating thickness may not draw the penetrant out from potential discontinuities. Heavy coatings of developer may mask fine indications.

c) The developer shall be allowed to dry for a minimum of seven minutes before interpretation. Interpretation shall be completed within thirty minutes after application. If the examination surface is sufficiently large to preclude complete examination within the prescribed time, the surface shall be examined in increments that allow compliance with the above time frames.

NOTE: The surface shall be closely observed during the application of the developer in order to monitor the behavior of indications that tend to bleed–out profusely.

9.1.5 Post Examination Cleaning

The developer is best removed in its dry state with the use of a soft dry brush, cloth or paper towel. The solvent cleaner described in 7.2 can then be applied. All remaining traces of developer shall be removed.

9.1.6 Remove penetrant materials which have "oversprayed" onto adjacent, non–examination surfaces, where applicable.

9.2 WATER WASHABLE

9.2.1 The precleaning, penetrant application and dwell time shall be as described in section 9.1. Penetrant removal shall be as follows:

a) Water washable penetrant materials can be removed directly from the examination area with water rinsing. The degree and speed of removal will

depend on such processing parameters as water pressure, water temperature and duration of the rinse cycle. Therefore it is important that the water-rinsing operation be controlled.

b) Water pressure should be constant and shall not exceed 50 psi. 30 psi is an average recommended value.

c) A coarse spray is generally recommended.

e) Maintain the temperature of the rinse water within the range of 60°F – 110°F

f) The duration of the rinse cycle shall be sufficient to eliminate any background that will interfere with interpretation. This duration shall be determined initially on a test part, and shall be documented on the examination data sheet.

NOTE: Avoid over–rinsing. Excessive rinsing can cause the penetrant to be washed out of discontinuities.

g) For Fluorescent water washable penetrant examinations, the rinsing shall take place in the darkened area under the UV lamp so that adequate removal can be determined.

9.2.2 Drying

a) The part shall be dry prior to the application of the developer (unless aqueous developer is used, in which case it may be applied immediately after the rinse cycle).

b) After the rinse, the part shall be thoroughly dried using the lint free material. Hot air may be used or the part may be dried by exposure to ambient temperature. The temperature of the examination surface shall not be allowed to exceed 125°F (compressed air shall not be used).

c) Drying time will vary depending on air temperature. The examination surface can be considered dry when all traces of dampness have disappeared.

9.2.3 Developer Application

a) Agitate the aerosol can to ensure that the developer is consistent.

b) Aqueous developers may be applied to the examination surface prior to drying. Exercise caution when applying a wet developer in order to avoid possible loss of indications.

c) Non–aqueous developer shall be applied after allowing the surface to dry. A thin coating of developer shall be uniformly sprayed over the examination surface.

NOTE: Insufficient coating thickness may not draw the penetrant out from potential discontinuities. Heavy coatings of developer may mask fine indications.

d) Aqueous developer should be allowed to air dry, or may be dried using forced hot air. The temperature requirements of 9.2.1.e shall apply.

e) Developing time begins immediately after the developer has dried.

NOTE: Precautions shall be taken to prevent any object from touching the dry developer film. It is easily damaged. When questionable results are obtained, the surfaces should be re–examined.

9.2.4 Interpretation of Indications

a) Interpretation shall be completed within thirty minutes after developer application. If the examination surface is sufficiently large to preclude complete examination within the prescribed time, the surface shall be examined in increments that allow compliance with the above time frames.

NOTE: The surface shall be closely observed during the application of the developer in order to monitor the behavior of indications that tend to bleed–out profusely.

b) Surface discontinuities are indicated by bleed–out of the penetrant which is normally a deep red color that stains the developer (color contrast) or a bright fluorescent green / yellow color when viewed under the influence of a UV lamp.

9.2.5 False indications

a) Color Contrast

Indications with a light pink color may indicate excessive cleaning. Inadequate cleaning may leave an excessive background making interpretation difficult.

Broad areas of pigmentation which could mask indications of discontinuities are unacceptable. Where this condition exists, the affected examination areas shall be cleaned and re–examined.

b) Fluorescent

The most common source of false indications is poor washing or cleaning after removal of the penetrant material from the surface. This condition will normally show up background fluorescence. Where this is noted, the examination areas affected shall be cleaned and re–examined. Lint and hairs can easily be mistaken for real indications.

9.2.6 Post Examination Cleaning

The developer is best removed in its dry state with the use of a soft brush, cloth or paper towel. The solvent cleaner described in 7.2 can then be applied. All remaining traces of developer shall be removed.

10. RECORDING/REPORTING/EVALUATION

NOTE: Adequate illumination is required to assure sensitivity during the examination and evaluation of indications. (See 8.3)

10.1 When there is profuse bleed–out, the initial size of this indication shall be noted, as well as the final bleed–out size. Instances where bleed–out from two or more discontinuities merge, these shall also be noted.

10.2 Localized surface irregularities from machining or handling or other surface conditions may produce nonrelevant indications. The nonrelevant indications that may mask relevant indications shall be recorded and recommended for rework of the surface followed by re–examination.

NOTE: If re–examination reveals any indications, at the direction of the plant owner, resurfacing shall be continued or these indications shall be regarded as relevant until otherwise established.

10.3 All relevant indications shall be reported by recording on the Liquid Penetrant Examination data sheet (Exhibit 1), and shall include:

- size (i.e., dimensions) of indication(s)
- shape of indication(s)
- location(s) on test part or the examination area(s)
- orientation
- sketch or photograph

When project or other specifications modify the Code requirements, the modified specifications shall govern.

10.4 All relevant indications recorded on the Liquid Penetrant Examination data sheet shall be evaluated by comparison with the applicable acceptance standards (Section 12) of the referencing Code section or other specification to which the examination relates. When project or other applicable written specifications modify the Code requirements, the modified specifications shall govern.

11. EXAMINATION RECORDS

11.1 A Liquid Penetrant Data Sheet (Exhibit 1) shall be completed for each examination unless otherwise required. The information recorded shall include the following:

a) Date of Examination
b) Identification of item examined
c) Identification of product
d) Brand name and type of penetrant materials used
e) Batch number of all penetrant materials
f) All processing times (e.g. Dwell time etc.)
g) Developing time before evaluation
h) All relevant indications to be shown by sketch or photograph or described with respect to a convenient datum point on the component or surface being examined, and to the extent specified in 10.3.

i) Any area(s) of the test part or examination zone not examined due to physical access limitations or other reasons.

j) The signature and certification Level of the examiner

k) Other information as required

11.2 Record Retention

NES record retention responsibility shall be limited to the time until the final report is transmitted.

12. ATTACHMENTS

12.1 Exhibit 1 Liquid Penetrant Data Sheet

12.2 Attachment A ASME B&PV Code Section XI, 1986 Edition

12.3 ASME B&PV Code Section III, Division 1 All editions and addenda from 1974 through Winter 1982.

12.4 Attachment B Examination of pressure retaining material and product form.

12.5 Attachment C Examination of weld–edge preparation surfaces.

12.6 Attachment D Examination of welds, areas of welds prepared for repair and repaired welds.

12.7 Attachment E ASME B&PV Code Section III, Division 2 All editions and addenda from 1974 through Winter 1982.

DATA SHEET NO. _____
THERMOMETER S/N _____
TEMPERATURE _____ ° F
NOMINAL THICKNESS ___ INCHES
MATERIAL _____
CLASS _____

LIQUID PENETRANT EXAMINATION

PROCEDURE _____
REVISION ___ F.C. NO. ___
PAGE _____ OF _____

SYSTEM EXAMINED _____ ISO/DWG/SK. # _____ REVISION _____
DATUM POINT REFERENCE _____

	BRAND NAME	TYPE	BATCH NO.	DRYING/DWELL TIME
CLEANER				MINUTES
PENETRANT				MINUTES
REMOVER				MINUTES
DEVELOPER				MINUTES

EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.

EXAMINER _____ LEVEL _____ DATE _____
EXAMINER _____ LEVEL _____ DATE _____
REVIEWER _____ LEVEL _____ DATE _____
REVIEWER _____ DATE _____
REVIEWER _____ DATE _____

NES 9/90 – REV. 1

NUCLEAR ENERGY SERVICES, INC.

EXHIBIT 1

ATTACHMENT A
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code Section XI
1986 Edition

Activity: Preservice and inservice inspections of nuclear power plant components.

Acceptance Criteria:

A. Linear surface flaws detected by surface examination methods shall be considered as a single linear indication provided the separation distance between indications is equal to or less than the dimension "S", where "S" is determined as shown in Figure A–1.

B. The overall length "Q" of a single and discontinuous surface indication shall be determined as shown in Figure A–1.

C. Where an indication extends beyond the surface examination boundaries, or separate linear indications lie both within and beyond the boundaries but are characterized as a single indication by Figure A–1, the overall indication indication size shall be compared with the applicable standards.

D. **Reactor Vessel**

Nominal Section Thickness, (T) inches	Allowable Linear Indication Length, (l), l/T, %
2 1/2	17.4
4 through 12	10.4
16	8.0

E. **Nozzle to Shell/Head (Class II only)**

Nominal Section Thickness, 2t, inches	Allowable Linear Flaw Length, (l), in.
5 1/2	3/16
2 1/2	1/4
≥ 4	3/8

F. Piping Welds

1. Austenitic Steels

Preservice

Nominal Section Thickness, (T) inches	Allowable Linear Indication Length, (l), inches
0.312 or less	1/8
1.0	3/16
2.0	1/4
3.0 and over	1/4

Inservice

0.312 or less	0.2
1.0	0.25
2.0	0.45
3.0 and over	0.65

2. Ferritic Steels

Preservice

Nominal Section Thickness, (T) inches	Allowable Linear Indication Length, (l), inches
less than 0.312	1/16
0.312	1/8
1.0	1/4
2.0	1/4
3.0	1/4
4.0	1/4

Inservice

less than 0.312	3/16
0.312	3/16
1.0	5/16
2.0	5/8
3.0	7/8
4.0	7/8

G. Dissimilar Metal Welds

In the case of dissimilar metal welds the Austenitic side of the weld is governed by Paragraph F.1 and the Ferritic side of the weld is governed by Paragraph F.2.

H. Pump Casings and Valve Bodies

1. Ferritic Material

Preservice

Nominal Wall Thickness, (T) inches	Surface Indication Length, (l), inches
2.0	1/4
3.0	1/4
4.0	1/4
5.0	1/4
6.0 and over	1/4

Inservice

2.0	0.3
3.0	0.45
4.0	0.6
5.0	0.75
6.0 and over	0.9

2. Austenitic Material

Preservice

Nominal Wall Thickness, (T) inches	Surface Indication Length, (l), inches
2.0	1/4
3.0 and over	1/4

Inservice

2.0	0.3
3.0 and over	0.45

3. Base material indications in castings that are permitted by the governing material specifications and accepted under the rules of ASME B&PV Code Section III are allowable.

I. Integral Attachments for Piping, Valves, Pumps and Vessels

1. The size of allowable indications shall not exceed the allowable indication standards of the applicable supported pressure retaining component to which the integral attachment is welded.

2. Laminar type indications found by the Liquid Penetrant method shall be examined by U.T. and acceptance based on the laminar acceptance standards of the supported pressure retaining component, unless otherwise directed by the Plant Owner.

J. Pressure Retaining Welds in Control Rod Drive Housings

The sizes of allowable indications shall not exceed:

1. 3/16" for preservice examination

2. 1/4" for inservice examination

K. Pressure retaining Bolting and Studs

The size of allowable indications shall not exceed:

1. nonaxial indications; 1/4 inch in length

2. axial indications; 1 inch in length

L. Notes pertaining to Paragraphs D, E, F and H

1. "T" is the nominal wall thickness or the actual wall thickness as determined by U.T. examination. If actual wall thickness is used as a basis for acceptance of an indication, note as such on this data sheet.

2. For intermediate nominal wall thicknesses, linear interpolation is permissible.

3. At the Plant Owner's request, if indications on the outer surface of components reference in Paragraphs E, F, H and I detected by the Liquid Penetrant Examination method during an "Inservice" Examination exceed the allowable standards, the indications may be examined by the volumetric method. The acceptance of these indications shall be governed by the allowable indication standards for the volumetric examination method.

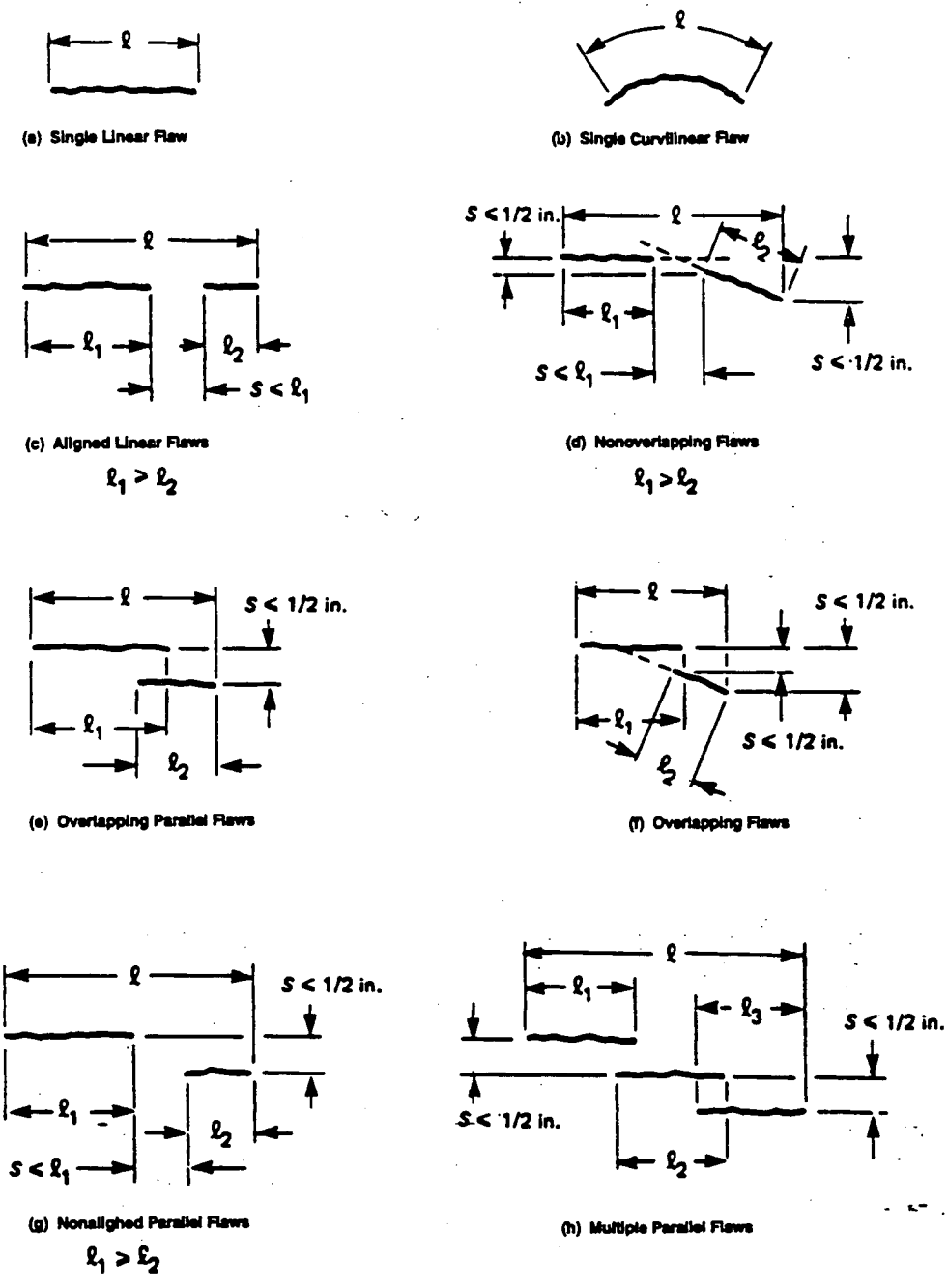


FIGURE A–1
LINEAR SURFACE INDICATIONS

Illustrative Flaw Configurations and Determination of Length

ATTACHMENT B
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 1
All Editions and Addenda from 1974 through 1986

Activity: Examination of pressure–retaining material and product form (i.e., "base material").

Acceptance Criteria: NB–2000, NC–2000, ND–2000, NE–2000

A. Only indications with major dimensions greater than 1/16 in. shall be considered relevant.

B. The following relevant indications are unacceptable:

(1) Any linear indications greater than 1/16 in. long for materials less than 5/8 in. thick, greater than 1/8 in. long for materials from 5/8 in. thick to under 2 in. thick and 3/16 in. long for materials 2 in. thick and greater;

(2) Rounded indications with dimensions greater than 1/8 in. for thickness less than 5/8 in. and greater than 3/16 in. for thicknesses 5/8 in. and greater;

(3) Four or more indications in a line separated by 1/16 in. or less edge to edge;

(4) Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

Note: Relevant indications are those which result from unacceptable mechanical discontinuities. Linear indications are those indications in which the length is equal to or greater than three times the width. Rounded indications are indications which are circular or elliptical with length less than three times the width.

ATTACHMENT C
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 1
All Editions and Addenda from 1974 through 1986

Activity: Examination of weld–edge preparation surfaces.

Acceptance Criteria: NB–5000, NC–5000

A. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

B. Laminar–type discontinuities are acceptable if they do not exceed 1 inch in length.

Note: The extent of all laminar–type indications exceeding 1 inch in length shall be determined by ultrasonic examination.

C. Other nonlaminar relevant indications which are unacceptable:

(1) Any linear indication greater than 3/16 inch long;

(2) Rounded indications with dimensions greater than 3/16 inch;

(3) Four or more indications, in a line separated by 1/16 inch or less, edge–to–edge.

ATTACHMENT D
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 1
All Editions and Addenda from 1974 through 1986

Activity: Examination of welds, areas of welds prepared for repair and repaired welds.

Acceptance Criteria: NB–5350, NC–5350, ND–5350, NE–5350*, NF–5350, NG–5350

A. Unless otherwise specified, the following relevant indications are unacceptable:

(1) Any cracks or linear indications

(2) Rounded indications with dimensions greater than 3/16 inch;

(3) Four or more rounded indications in a line separated by 1/16 inch or less, edge–to–edge;

(4) Ten or more rounded indications in any 6 square inches of surface with the major dimension of this area not to exceed 6 inches with the area taken in the most unfavorable location relative to the indications being evaluated.

*B. Indications with major dimensions greater than 1/16 inch shall be considered relevant and evaluated according to the applicable acceptance criteria.

Note: Linear indications are those indications in which the length is more than three times the width. Rounded indications are circular or elliptical with length less than three times the width. Relevant indications are those which result from mechanical discontinuities.

* For examination to Article NE–5350, (B) above does not apply.

ATTACHMENT E
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Division 2
All Editions and Addenda from 1974 through 1986

Activity: Examination of welds in all liner thicknesses.

Acceptance Criteria: CC–5000

A. Unless otherwise specified, the following relevant indications are unacceptable:

(1) Any cracks or linear indications

(2) Rounded indications with dimensions greater than 3/16 in. (4.8 mm)

(3) Four or more rounded indications in a line separated by 1/16 inch (1.6 mm) or less edge–to–edge

(4) Ten or more rounded indications in any 6 sq. in. (3870 mm) of surface with the major dimension of this area not to exceed 6 in. (152 mm) with the area taken in the most unfavorable location relative to the indications being evaluated.

B. Relevant indications are those which result from unacceptable mechanical discontinuities.

Note: Linear indications are those indications in which the length is more than three times the width. Rounded indications are indications which are circular or elliptical with the length less than three times the width.

ATTACHMENT F
LIQUID PENETRANT EXAMINATION

ASME Boiler & Pressure Vessel Code
Section III, Divisions 1 & 2
All Editions and Addenda from 1974 through 1986

Activity: Examination of welds, areas of welds prepared for repair and repaired welds.

Acceptance Criteria:

Unless otherwise specified the following criteria applies:

All surfaces required to be examined shall be free of:

C. Relevant linear indications,

D. Four or more rounded indications in a line separated by 1/16 inch or less (edge–to–edge) except where the specifications for the material established different requirements for acceptance so far as defects are concerned.

E. Relevant rounded indications greater than 3/16 inch.

Notes:

(1) Relevant indications are those which result from mechanical discontinuities. Only indications with major dimensions greater than 1/16 inch shall be considered relevant.

(2) Linear indications are those indications in which the length is more than three times the width.

(3) Rounded indications are indications which are circular or elliptical with the length less than three times the width.

13.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1218

MAGNETIC PARTICLE EXAMINATION

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9/3/93

Expiration Date 3/2/94

RECOMMENDED BY: _____ 8/26/93
Engineering Manager - Programs — Date

APPROVED BY: Timothy P. Cleary 27AUG93
Manager - Technical Support — Date

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 30	0

MAGNETIC PARTICLE EXAMINATION

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

Project Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. - SIGNATURE - DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	GENERAL MGR.	
0	Scott Larson		2/20/92	2/20/92	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6111

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL

FORM # NES 206 3/90

1. PURPOSE

1.1 The purpose of this procedure is to establish the requirements for magnetic particle (MT) examination and to describe the techniques for wet (visible or fluorescent) and dry powder applications, including circular and longitudinal magnetization by prods, yoke, coil and central conductor.

2. SCOPE

2.1 This procedure incorporates the methodology and requirements of the Codes and Standards referenced in Section 3.0 and may be used for the detection of discontinuities at or near the surface in ferromagnetic materials of all product forms.

2.2 This procedure meets the requirements of the referenced documents to the extent specified in this procedure.When project specifications invoke or modify these requirements, the project specifications shall govern. Project requirements or modified requirements may be addended to this procedure as necessary.

3. REFERENCES

3.1 ASME B & PV Code, Section III Edition as applicable.

3.2 ASME B & PV Code, Section V 1986 Edition.

3.3 ASME B & PV Code, Section XI 1986 Edition.

3.4 80A9068, NES Procedure for Certifying Nondestructive Examination Personnel (Latest Revision).

3.5 80A9054, NES Procedure for Check of Magnetic Particle Inspection Equipment (Latest Revision).

3.6 83A6091, NES Procedure PSI/ISI Examination Areas and Volumes for H.B. Robinson (Latest Revision).

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with reference 3.4.

4.2 A copy of each examiner's certification summary and eye test shall be made available to the plant owner or his agent prior to performing examinations per this procedure.

4.3 A copy of each examiner's certification summary and eye test shall be maintained on site.

4.4 Interpretation of examination results shall be conducted by personnel with a minimum certification of Level II MT.

5. SAFETY PRECAUTIONS

NOTE: This procedure may involve hazardous materials, operations, and equipment. The procedure does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to observe good safety and health practices.

Some MT equipment employs electrical potential of significant magnitude and should be used with consideration to at least the following precautions:

5.1 Equipment electrical grounding should not be defeated.

5.2 Electrical connections should be secure and cable insulation should be in good condition.

5.3 Personnel should avoid standing on wet or damp surfaces while operating equipment.

5.4 UV protective glasses should be worn when conducting fluorescent MT.

5.5 Eye protection should be worn during examinations.

5.6 Some examination media may cause skin irritation. Precautions should be taken to avoid prolonged skin contact.

6. DEFINITIONS

6.1 Area of Interest – Area of part or component on which surface examinations will be conducted.

6.2 Nonrelevant Indications – These are indications produced by particle gravitation, part geometry, surface condition or leakage fields that are unrelated to the discontinuities that may constitute defects. Also known as "False Indications"

6.3 Continuous Method – The magnetizing current remains on while the examination medium is being applied, and in the ease of dry powder, while the excess examination medium is being removed.

6.4 Recordable indication – any relevant indication.

7. EQUIPMENT AND MATERIAL REQUIREMENTS

7.1 MAGNETIC APPARATUS

7.1.1 The magnetizing apparatus shall be capable of inducing a magnetic flux of suitable intensity and direction in the part. The following Equipment or its equivalent shall be used contingent upon the application:

a) Magnetic Yokes: Magnaflux, Parker Research or equivalent.

b) Other Equipment: Magnaflux, or other magnetizing units that are capable of producing both AC and DC magnetizing currents.

c) Cables: 4/0 or larger cables shall be used. Minimum cable length will maximize amperage output.

NOTE: Prod devices shall be equipped with a remote control switch to permit the current to be turned on after the contacts have been properly positioned and to be turned off before contacts are removed.

7.1.2 Magnetic Particle Field Indicator. (pie gage)

7.1.3 Appropriate "Lift Test" weights (10lbs – AC, 40lbs – DC)

7.1.4 Ultraviolet Lighting (where required).

7.1.5 Light Meter(s) (as required) with valid calibration.

7.1.6 18% Neutral Gray Card (as required).

7.1.7 Temperature measuring device with the ability to measure the appropriate temperature range.

7.1.8 Magnetic Particle applicators and blowers as necessary.

7.1.9 Residual Field Indicator. (where necessary)

7.1.10 Other Suggested Equipment:

a) Mirror

b) Flashlight

c) UV glasses/goggles

d) Magnifying Lens

e) Camera

7.2 MATERIALS

7.2.1 Dry Particles:

The magnetic particles shall be non–toxic, finely divided, ferromagnetic material of high permeability and low retentivity, free from extraneous material which might interfere with their proper functioning. The particles shall be of a color, size, and shape that will provide adequate sensitivity and contrast against the examination surface. The following particles or their equivalent shall be used.

a) Magnaflux No. 8A.

b) Parker Research GP–5 or RP–6

7.2.2 Wet Particles:

Wet Magnetic Particles may be color contrast or fluorescent. Particles used for examination shall be contained in an aerosol spray cans. Concentrations shall be certified to meet the requirements of ASME Section V, Article 25, SE–138. The following or their equivalent shall be used:

a) Magnaflux Red 9C

b) Magnaglo – 14 AM

8. GENERAL PREREQUISITES

8.1 EXAMINATION ITEM(S)

8.1.1 The components to be examined shall be identified/determined by the plant owner.

8.1.2 The component shall be prepared for examination by the plant owner, i.e. the examination surface shall be free of foreign matter which may interfere with the examination. See Paragraph 11.0.

8.1.3 In order to preclude the entry of magnetic particles into system openings, suitable precautions such as plugging of openings, shall be taken.

8.2 EQUIPMENT AND CONDITIONS

8.2.1 A valid Calibration Sticker shall be attached to all Magnetizing equipment being used for examinations.

8.2.2 Yoke Magnetizing equipment "Lift Test" verification shall be conducted at the beginning of each shift. See Paragraph 9.1.

8.2.3 Magnetizing units equipped with ammeters shall meet the calibration requirements of reference 3.5.

8.3 LIGHTING

8.3.1 Light intensity shall be verified as described in Paragraph 12.0.

9. EQUIPMENT PERFORMANCE VERIFICATION

9.1 MAGNETIC YOKES

9.1.1 Alternating Current (AC) electromagnetic yokes shall be capable of lifting at least a ten (10) lb weight.

The lifting capacity of yokes with adjustable poles shall be verified at a pole spacing of six inches, or at least the maximum spacing at which the unit will be used during examinations. Daily verifications are recommended.

9.1.2 Direct Current (DC) electromagnetic and/or Permanent magnetic yokes shall be capable of lifting at least a forty (40) lb weight. The lifting capacity of yokes with adjustable poles shall be verified at a pole spacing of six inches, or at least the maximum spacing at which the unit will be used during examinations. Daily verifications are recommended.

NOTE: A calibration sticker shall be applied annually as required by reference 3.5. Daily verifications (when performed) shall be documented on the examination data sheet. (Exhibit 1).

9.2 PRODS

9.2.1 Each piece of magnetizing equipment with an ammeter shall be calibrated at least once per year as per reference 3.5

9.2.2 Prod type equipment. Care shall be taken to avoid arc strikes. A "built in" remote control switch that enables the current to be turned on after the proper positioning of the prods shall be used. Lead, steel or aluminum tips are recommended.

10. EXAMINATION AREAS

10.1 For ASME Section XI code examinations see the specific requirements in ASME Section XI (Ref 3.6)

10.2 For codes other than reference 10.1, the areas of interest shall be as follows unless instructed otherwise by the plant owner. This instruction shall be documented on the "Magnetic Particle Examination" report form:

10.2.1 Welds

The area of interest shall be the weld area and at least 1" on all accessible sides measured from the edge of the weld.

10.2.2 Weld Preparations

The area of interest shall be the bevel area and at least 1" on all sides.

10.2.3 Other Components:

As specified.

11. SURFACE CONDITIONS

11.1 Satisfactory results are usually obtained when the surfaces are in the as–welded, as–rolled, as–cast, or as–forged condition. However, where surface irregularities could mask relevant indications, preparation may be accomplished by wire brushing, grinding, machining or grit blasting. Vapor degreasing and solvents intended for use with liquid penetrant examination are also recommended where necessary.

NOTE: The owner shall authorize and be responsible for any surface preparation that involves the removal of metal.

11.2 The surface to be examined and any adjacent area within one inch of the area to be examined, shall be dry and free of any dirt, grease, lint, scale or any extraneous matter that would interfere with the examination. Additionally, the surface area(s) to be examined shall be free of paint.

NOTE: The examiner shall notify the NES "lead individual" or other designated contact when surface preparation is not suitable for the magnetic particle examination.

11.3 SURFACE TEMPERATURES

11.3.1 Dry magnetic particle examination shall not be performed if the surface of the part exceeds 600 degrees Fahrenheit.

11.3.2 Wet magnetic particle examination shall not be performed if the surface of the part or the wet particle suspension exceeds 135 degrees Fahrenheit.

12. LIGHTING REQUIREMENTS

12.1 Visible magnetic particle indications can be viewed in either natural light or artificial white light. Adequate light intensity is required to maintain sensitivity in the examination. A minimum light intensity at the examination surface shall be indicated by either:

a) The resolution of a 1/32–inch wide (maximum) black line on an 18 percent neutral gray card placed on or near the surface to be examined, or:

b) A minimum reading of light intensity of 50 footcandles (360 lx) on a meter sensitive to white light placed on or near the surface to be examined.

12.1.1 Black Light (UV)

a) The UV lamp shall be capable of producing a measured intensity of 800 uW/cm2 minimum, at a distance of at least 15 inches from the lens to the examination surface.

b) The black light intensity shall be determined at least once every 8 hours and whenever the work location is changed.

c) Intensity at the surface to be examined shall be determined using a meter which is sensitive to light in the ultraviolet spectrum centered on 365 nm (3650A).

d) The UV lamp shall be allowed to warm up for at least five minutes before being measured for intensity and/or usage.

e) The lamp should be left on. Turning it off and on severely reduces the life of the bulb.

f) Lamps with cracked or scratched filters should not be used.

13. EXAMINATION PREREQUISITES:

13.1 Prior to performing any magnetic particle examination, assure that the equipment has a current calibration as required by Paragraph 3.5.

13.2 The magnetizing force and direction shall be verified as required in Paragraph 14.0

13.3 FLUORESCENT MT EXAMINATIONS

13.3.1 The requirements for viewing the surface in order to perform the interpretation are as follows:

a) The Examination shall be performed in a darkened area.

b) The examiner shall be in the darkened area for at least 5 minutes prior to interpretation to enable the eyes to adapt to dark viewing.

c) If the examiner wears glasses or contact lenses, they shall not be photo sensitive. (They could darken under the influence of the UV lighting and reduce sensitivity).

13.4 VISIBLE MT EXAMINATIONS

13.4.1 The requirements for viewing the surface in order to perform the interpretation are as per Paragraph 12.0.

13.5 MAGNETIC FIELD VERIFICATION

13.5.1 Where required, the magnetic particle field indicator (Exhibit 2) shall be used by positioning the indicator (copper side up) on the surface to be examined. In using this indicator, a suitable field strength is indicated when a clearly defined line of magnetic particles forms across the copper face of the indicator when the magnetic particles are applied simultaneously with the magnetizing force. Care shall be taken to ensure that oversaturation of the part (causing "banding" of the particles) does not occur.

13.5.2 The use of the magnetic particle field indicator is not required for each item examined; its use is required at the initial examination of a specific technique and when the following changes are made:

Amperage settings
Type of Magnetic Field
Type of Current
In Distance Between Pole Placement using a yoke
Test piece configuration

NOTE: When the particles do not accumulate on the Magnetic Particle Field Indicator in the desired direction or do not accumulate at all, the magnetizing technique shall be changed or adjusted to establish the necessary magnetic field.

14. EXAMINATION PROCEDURES

14.1 YOKE METHOD

NOTE: This method shall be applied to detect discontinuities that are open to the surface only.

14.1.1 Magnetic flux is induced using AC, DC or permanent magnet yokes.

14.1.2 AC is the recommended current type for the detection of surface breaking discontinuities. AC yokes are superior to DC or permanent magnet yokes of equal lifting power. (Except for materials < 1/4" Thick).

14.1.3 At least two separate examinations shall be conducted on each area examined. The second examination shall be with the lines of magnetic flux approximately perpendicular to the direction used for the first examination in that area.

14.1.4 The test surface shall be magnetized by inducing a magnetic field into the part as follows, using the continuous method:

a) Using a pole spacing of 3 – 6 inches, place the poles on the surface of the test component. (spacing is measured linearly along the examination surface when examining a curved surface in the circumferential direction).

b) With the current flowing, apply the magnetic particles (wet or dry) lightly to the surface.

NOTE: Do not saturate the surface with particles. This practice could mask relevant indications.

c) Dry Particles – With the current flowing, remove the particles from the surface using the air bulb. Take care not to apply the air at too high a pressure, as this could remove lightly held particles from shallow discontinuities.

d) Wet Particles – Allow the current to flow for approximately ten seconds after application of the particles.

e) Inspect the area for indications using the appropriate illumination.

NOTE: For maximum sensitivity, the lines of force should be essentially perpendicular to the axis of the suspected discontinuity.

14.1.5 The inspection area shall be: limited to an area that can be qualified as in 13.5.

14.1.6 Overlapping of the examination area shall be at least 1 inch (see Exhibit 3). The examination area shall be inspected with sufficient overlap to ensure 100 percent coverage at the established test sensitivity.

14.1.7 Where the area of interest does not include the entire surface, the pole location shall extend at least 1 inch beyond the area of interest.

NOTE: Prolonged energizing cycles may overheat and damage the magnetizing equipment.

14.2 PROD METHOD

14.2.1 Magnetization shall be accomplished by the use of portable prod type electrical contacts pressed against the surface in the area to be examined.

14.2.2 At least two separate examinations shall be carried out on each area, with prods placed so the lines of flux in one examination are approximately perpendicular to the lines of force in the other.

14.2.3 Prod spacing shall be a minimum of three (3)inches and a maximum of eight (8) inches.

14.2.4 The inspection area shall be limited to an area that can be qualified as in 13.5. Overlapping of the examination area shall be at least one (1) inch (see Exhibit 3). The examination area shall be inspected with sufficient overlap to ensure 100 percent coverage at the established test sensitivity.

14.2.5 Direct or rectified magnetizing current shall be used. The current shall be 100 amperes per inch minimum to 125 amperes per inch maximum of prod spacing, for sections 3/4 inch thick or greater. For sections less than 3/4 inch thick, amperage shall be 90–110 amperes per inch of prod spacing.

14.2.6 Care shall be taken to avoid arc strikes. To avoid arc strikes, turn on the current only AFTER the prod tips have been placed firmly in contact with the test surface. Turn off the current to the prods BEFORE removing them from the test surface.

14.2.7 Any accidental arc strikes shall be noted on the examination data sheet and immediately brought to the attention of the site supervisor/NES lead.

NOTE: Prolonged energizing cycles may cause undesirable local overheating of the surface. Extreme care should be taken to maintain clean prod tips in order to minimize heating at the point of contact.

In addition to the above, prolonged energizing cycles may overheat and damage the magnetizing equipment.

14.3 COIL TECHNIQUE

NOTE: The following formulas are the requirements of ASME Section V, for determining the strength of the magnetic field. Where the part being examined does not entirely fill the coil (low "Fill Factor"), the formulas in Paragraph 14.3.2(b) or 14.3.2(c) should be considered. The field strength shall be verified using the Magnetic Field Indicator as per Paragraph 13.5.

14.3.1 Magnetization shall be accomplished by passing current through a multiturn coil looped through or around the part, or section of the part, to be examined. This produces a Longitudinal magnetic field parallel to the axis of the coil. (See Exhibit 4).

14.3.2 Magnetic Field Strength: Direct or rectified current shall be used to magnetize parts examined using this technique. The required field strength shall be calculated based on the Length (L) and the Diameter (D) of the part in accordance with (a), (b) or as established in (c) below. Long parts shall be examined in sections not to exceed 18 inches, and 18 inches shall be used for the part L in calculating the required field strength. Parts greater than 18 inches in length shall be examined in increments of 18 inches or less. For noncylindrical parts, D shall be the maximum cross sectional diagonal.

a) Parts with L/D ratios equal to or greater than 4.

The magnetizing current shall be within + 10% of the ampere–turns' value determined as follows:

$$\text{Ampere–turns} = \frac{35.000}{(L/D)+2}$$

EXAMPLE: A part 10" long x 2" diameter will have an L/D ratio of 5, therefore:

$$\text{Ampere–turns} = \frac{35.000}{(5+2)} = 5000 \text{ ampere–turns}$$

$$\frac{5.000}{5} = 1000 \text{ (turns)}$$

Using a five turn coil, the magnetizing current will be 1000 amperes.

b) Parts with L/D ratios less than 4 but not less than 2, and for LOW FILL FACTOR coils (eccentrically positioned parts less than 10% coil inside diameter):

The magnetizing current shall be within + 10% of the ampere–turns' value determined as follows:

$$\text{Ampere-turns} = \frac{45{,}000}{(L/D)}$$

EXAMPLE: A part 12" long x 4" diameter will have an L/D ratio of 3, therefore:

$$\text{Ampere-turns} = \frac{45{,}000}{3} = 15{,}000 \text{ ampere-turns}$$

$$\frac{15{,}000}{5} = 3000 \text{ (turns)}$$

Using a five turn coil, the magnetizing current will be 3000 amperes.

NOTE: For L/D ratios less than 2, alternate magnetizing methods shall be used.

c) Low Fill-Factor Coils. (Parts Positioned in Center of Coil)

$$NI = \frac{KR}{(6L/D)-5} \quad (\pm 10\%)$$

where:

K = 43,000 (empirically derived constant)
R = coil radius in inches
Other factors as above.

14.3.3 If the area to be magnetized extends beyond 6 in. on either side of the coils or for large parts, the field adequacy shall be demonstrated using the magnetic field indicator per paragraph 13.5.

14.3.4 At least two separate examinations shall be carried out on each area. The second examination shall be with the lines of magnetic flux approximately perpendicular to those used for the first examination in that area. A different means of magnetizing may be used for the second examination.

NOTE: If the above paragraphs are not applicable because of part size or shape, adequate magnetizing amperage shall be established by using the magnetic Particle Field Indicator in accordance with paragraph 13.5. Care shall be taken to ensure that oversaturation of the part (causing "banding" of the particles) does not occur.

14.4 DIRECT CONTACT TECHNIQUE

14.4.1 Magnetization shall be accomplished by passing current the part to be examined. This produces a "circular" magnetic field perpendicular to the current flow through the part.

14.4.2 Magnetizing Current: Direct or rectified current shall be used The required current shall be determined using the following guidelines:

a) For parts with outer diameters up to 5 inches, 700–900 amperes per inch of diameter shall be used.

b) For parts with outer diameters over 5 inches up to 10 inches diameter, 500–700 amperes per inch of diameter shall be used.

c) For parts with outer diameters over 10 inches up to 15 inches diameter, 300–500 amperes per inch of diameter shall be used.

d) For parts with outer diameters over 15 inches diameter, 100–330 amperes per inch of diameter shall be used.

e) For parts with geometric shapes other than round, the greatest cross sectional diagonal in a plane at right angles to the current flow shall determine the inches to be used in the above computations.

NOTE: If the current levels required in any of the above cannot be obtained, the maximum current obtainable shall be used and the field adequacy shall be demonstrated as per Paragraph 13.5.

14.4.3 At least two separate examinations shall be carried out on each area; in the secondary examination, the lines of magnetic flux shall be approximately perpendicular to those used for the first examination in that area. A different means of magnetizing may be used for the second examination.

14.5 CENTRAL CONDUCTOR TECHNIQUE

For this technique, a central conductor us used to examine the internal surfaces of ring or cylindrically shaped parts. This technique may also be used to examine the outside surfaces of these shapes. Where large diameter cylinders are to be examined, the conductor shall be

positioned close to the internal surface of the cylinder. When the conductor is not centered, the circumference of the cylinder shall be examined in increments and a magnetic field indicator applied in accordance with Paragraph 13.5. to determine the extent of the arc that may be examined for each conductor position. Bars or cables may be used to induce circular magnetization.

14.5.1 Magnetizing current: The field strength required shall be equal to that determined in Paragraph 14.4.2 for a sin turn central conductor. The magnetic field will increase in proportion to the number of times the conductor passes through a hollow part.

NOTE: A central conductor of as large a diameter as practical shall be used in all cases where inspections of the inside surfaces of cylindrically shaped parts is required. A central conductor shall also be used for circular magnetization of other shapes, when applicable.

Example: If 6000 amps are required to examine a part using a single central conductor, then 3000 amps are required when 2 turns of the through cable are used; and 1200 amps are required if five turns are used. Magnetic field adequacy shall be verified in accordance with Paragraph 13.5.

15. EVALUATION/RECORDING/REPORTING

15.1 Discontinuities on or near the surface are indicated by retention of the examination medium (particles). Localized surface irregularities such as machining marks, material transitions, splines, keyways, and other geometric conditions which may cause a magnetic leakage field. Any indication which is believed to be false or nonrelevant shall be re-examined to verify whether or not actual discontinuities are present.

15.2 Relevant indications are those which result from mechanical discontinuities.

NOTE: Unless otherwise defined by the referencing Code or specification, the following parameters are to be used for the purposes of evaluation:

15.2.1 Linear indications are those indications in which the length is equal to or greater than three times the width.

15.2.2 Rounded indications are indications which are circular or elliptical with the length less than three times the width.

15.2.3 All indications that cannot be interpreted as false or nonrelevant and whose major dimension is greater than 1/16th inch shall be considered relevant. If it is necessary to identify additional characteristics of the indication such as the type, linear, rounded, etc., these characteristics shall be recorded on the data sheet.

15.3 All relevant indications shall be reported by recording on the Magnetic Particle Examination Data Sheet (Exhibit 1), and shall include:

- size (i.e., dimensions) of indications
- shape of indication(s)
- locations(s) on test part or the examination area(s) orientation
- sketch or photograph

15.4 All relevant indications recorded on the Magnetic Particle Examination Data Sheet shall be evaluated by comparison with the applicable acceptance standards of the referencing Code section or other specification to which the examination relates. When project or other applicable, written specifications modify the Code, the modified specifications shall govern.

NOTE: Refer to Exhibit 5 and 6 (as appropriate).

16. DEMAGNETIZATION

16.1 All ferromagnetic material will retain some residual magnetism, the strength of which is dependent on the retentivity of the part. Residual magnetism does not affect the mechanical properties of the part. Residual magnetism may affect subsequent machining, plating and welding. Demagnetization is required only if specified in the drawings or specification, or by the plant owner.

16.2 Alternating current yokes may be used for local demagnetization by placing the poles on surface, moving them around the area, and slowly withdrawing the AC yoke while it is still energized.

16.3 Care should be exercised to assure that the part is entirely removed from the influence of AC yoke before the demagnetizing force is discontinued, otherwise the demagnetizer may have the reverse effect of magnetizing the part.

16.4 The part should be checked for residual magnetism using a residual field indicator.

16.5 Other means of demagnetization may be used as approved by a Level III MT.

17. FINAL CLEANING

Magnetic particles should be removed from accessible surfaces

DATA SHEET NO. _____
THERMOMETER S/N _____
TEMPERATURE* _____ ° F
NOMINAL THICKNESS ____ INCHES
MATERIAL _____
CLASS _____

MAGNETIC PARTICLE EXAMINATION

PROCEDURE _____
REVISION ____ F.C. NO. ____
PAGE _____ OF _____

SYSTEM EXAMINED _____ ISO/DWG/SK. # _____ REVISION _____

DATUM POINT REFERENCE _____

* REQUIRED FOR WET METHODS ONLY

MAGNETIC PARTICLES

Dry ☐ Wet ☐
Make _____
Type _____
Batch No. _____
Color _____

EQUIPMENT

Yoke ☐ Coil ☐ Prod ☐
Make _____
Serial No. _____
AC ☐ DC ☐
AMP Turns _____
AMPS _____
Pole Spacing _____
Yoke Lift Test
Yes ☐ No ☐

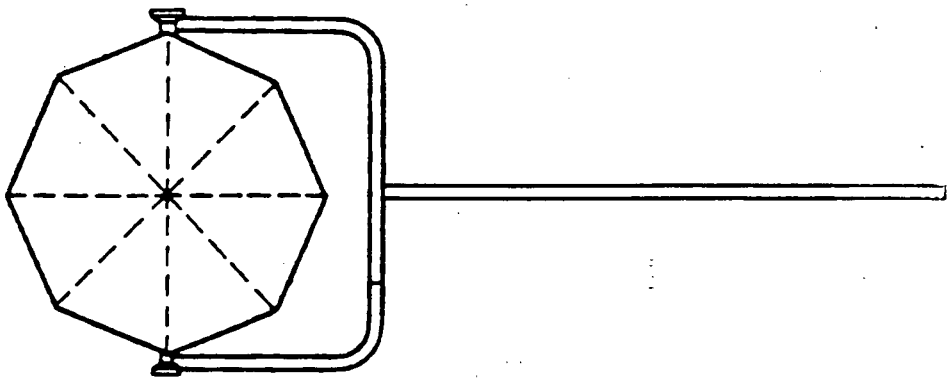
EXAM ITEM	DESCRIPTION/REMARKS	ACC.	REJ.

EXAMINER _____ LEVEL _____ DATE _____
EXAMINER _____ LEVEL _____ DATE _____
REVIEWER _____ LEVEL _____ DATE _____
REVIEWER _____ DATE _____
REVIEWER _____ DATE _____

NES 9/90 - REV. 1

NUCLEAR ENERGY SERVICES, INC.

EXHIBIT 1



MAGNETIC PARTICLE FIELD INDICATOR

EXHIBIT 2

For complete inspection the entire area will have to be covered in this manner and then the process must be repeated with yoke positions at 90° to the first direction.

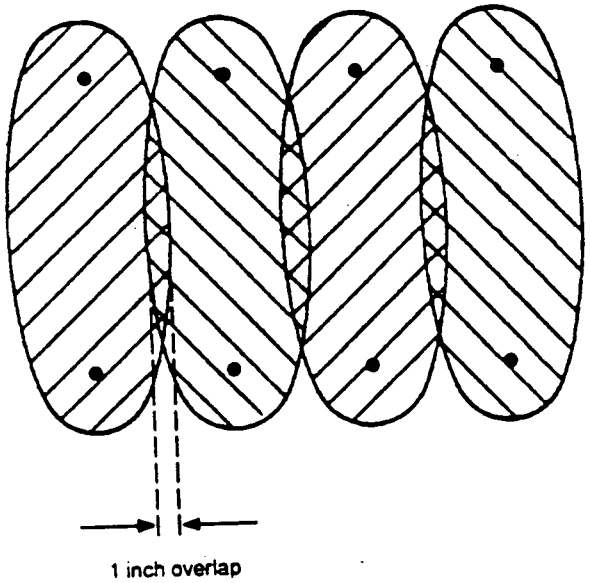


EXHIBIT 3

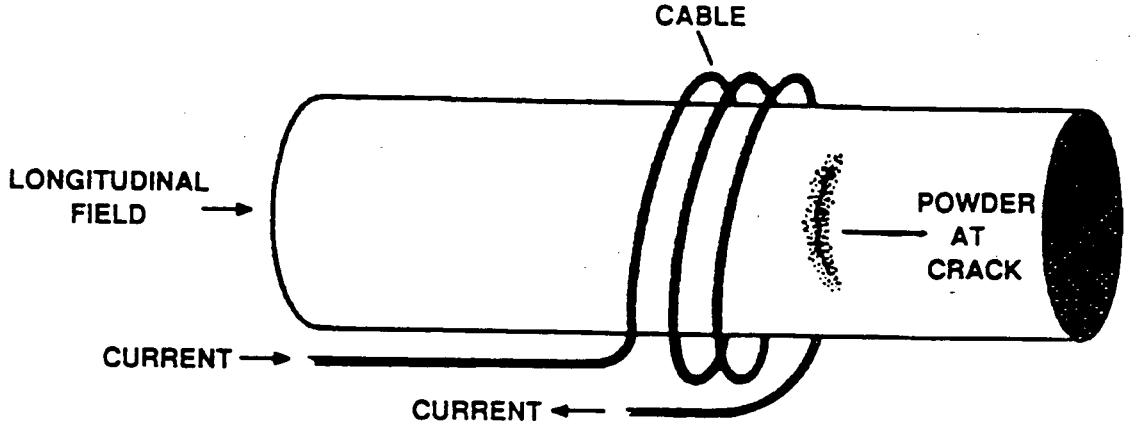


EXHIBIT 4

ASME SECTION XI ACCEPTANCE STANDARDS

Magnetic Particle Recording/Reporting Levels

A. Recording Levels:

1. Any cracks and linear indications.
2. Rounded indications with dimensions greater than 1/16".
3. Four or more rounded indications in a line separated by 1/16" or less edge to edge.
4. Ten or more rounded indications in any 6 square inches of surface with the major dimension of this area not to exceed 6" with the area taken in the most unfavorable location relative to the indications being evaluated.

Applicability to Section XI Categories: B-F, B-G-1, B-H, B-J, B-K-1, B-L-1, B-M-1, B-0, C-B, C-C, C-E, C-F, C-G.

B. Reporting Levels:

1. Any cracks.
2. Linear or rounded indications greater than 1/8".
3. Four or more rounded indications in a line separated by 1/16" or less edge to edge.
4. Ten or more rounded indications in any 6 square inches of surface with the major dimension of this area not to exceed 6" with the area taken in the most unfavorable location relative to the indications being evaluated.

Applicability to Section XI Categories: B-F, B-G-1, B-H, B-J, B-K-1, B-L-1, B-M-1, B-0, C-B, C-C, C-E, C-F, C-G.

EXHIBIT 5

ASME SECTION III ACCEPTANCE STANDARDS

Acceptance Criteria vary with the manufacturing process and the applicable subsection of ASME Section III.

The following relevant indications are unacceptable and only indications whose major dimensions are greater than 1/16 inch shall be considered relevant:

Any cracks or linear indication.

Rounded indications with dimension greater than 3/16 inch.

Four or more rounded indications in a line separated by 1/16 inch or less edge to edge.

Ten or more rounded indications in any 6 square inches of surface with the major dimension of this area not to exceed 6 inches with the area taken in the most unfavorable location relative to the indications being evaluated.

The following relevant indications are unacceptable except where the specification for the material establishes different requirements:

Cracks and linear indication. (Linear indications are those indications in which the length is equal to or greater than three times the width).

Four or more rounded indications in a line separated by 1/16 inch or less edge to edge.

Weld edge preparation surfaces in joint categories A, B, C, D and similar joints in material 2 inches or more in thickness shall be evaluated to the following acceptance standard. The following relevant indications are unacceptable and only indications with major dimensions greater than 1/16 inch shall be considered relevant:

Laminar type discontinuities greater than 1 inch in length.

Linear indications greater than 3/16 inch long.

Rounded indications with dimensions greater than 3/16 inch.

Four or more indications, in a line separated by 1/16 inch or less, edge to edge.

Welds and weld edge preparation surfaces in material 1 inch and greater shall be evaluated as required below.

EXHIBIT 6

The following relevant indications are unacceptable and only indications with major dimensions greater than 1/16 inch shall be considered relevant:

Any linear indication greater than 1/8 inch long for materials 1 inch thick to under 2 inches thick and 3/16 inch long for materials 2 inches thick and greater.

Rounded indications with dimensions greater than 3/16 inch.

Four or more indications greater than 1/16 inch long in a line separated by 1/16 inch or less edge to edge.

Ten or more indications greater than 1/16 inch long in any 6 square inches of area whose major dimension is no more than 6 inches with the dimension taken in the most unfavorable location relative to the indications being evaluated.

Laminar type discontinuities greater than 1/2 inch.

The following relevant indications are unacceptable and only indications with major dimensions greater than 1/16 inch shall be considered relevant:

Linear indications greater than 1/16 inch long for material less than 5/8 inch in thickness.

Linear indications having a length greater than 1/8 inch for thickness from 5/8 inch to under 2 inches.

Linear indications having a length 3/16 inch for material thickness 2 inches or greater.

Rounded indications greater than 1/8 inch for thickness less than 5/8 inch.

Rounded indications greater than 3/16 inch for thickness 5/8 inch or greater.

Four or more indications in a line separated by 1/16 inch or less edge to edge.

Ten or more indications in any 6 square inches of area whose major dimension is no more than 6 inches with the dimensions taken in the most unfavorable location relative to the indications being evaluated.

Bolting:

The following indications are unacceptable for bolting 1 inch and greater in nominal size for Class 1 NB and 2 inches and greater for bolting and rods in nominal size for Class 1 component supports:

EXHIBIT 6–1

Linear nonaxial indications.

Linear axial indications greater than 1 inch in length.

The following relevant indications are unacceptable and only indications with major dimensions greater than 1/16 inch shall be considered relevant, threaded fasteners greater than 3/8 inch and nuts greater than 1 inch shall be evaluated as follows:

On threaded surfaces no relevant indications.

All other accessible surfaces, no linear or rounded indications greater than 1/16 inch, except that linear axial indications the smaller of 1 diameter or 1 inch in length are permitted.

Acceptance Criteria for Non–ISI Examinations

General Requirements

Examinations being performed to codes other than that of ASME Section XI where accept/reject criteria is delineated, relevant indications in welds, base material and bolting materials which exceed the applicable acceptance criteria shall be documented as follows:

Maximum length
Location of Test Part
Orientation of Indication
Sketch or Photograph if deemed necessary

The technician performing the test shall apply the acceptance criteria as specified in the engineering/work authorizing document associated with the job. The acceptance criteria of this procedure may be used if the exact specific code by year and date are referenced in the work authorizing document.

EXHIBIT 6–2

18.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1219

ULTRASONIC EXAMINATION OF COMPONENT WELDS IN FERRITIC AND AUSTENITIC MATERIALS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/12/93

Expiration Date 2/11/94

RECOMMENDED BY: _____ 7/27/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 8/4/93
Manager / Technical Support — Date

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 35	0

ULTRASONIC EXAMINATION

OF COMPONENT WELDS

IN FERRITIC

AND AUSTENITIC MATERIALS

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

Project Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	GENERAL MGR.	
0	Scott Larson	2/20/92	2/20/92	2/20/92	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6131

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL

FORM # NES 206 3/90

1. PURPOSE

The purpose of this procedure is to define the technique, recording criteria and equipment for the Ultrasonic (UT) examination of component welds in ferritic and austenitic material.

2. SCOPE

2.1 This procedure is limited to the manual ultrasonic examination of welds in ferritic and austenitic wrought (rolled, drawn, forged, or extruded) and cast materials, excluding piping systems.

Note: This procedure is not applicable to piping systems.

2.2 This procedure is applicable only to components beyond the scope of ASME Code Section V, Article 4 and Appendix III of Section XI except as noted in 2.3.

2.3 Components less than 0.75 inches in thickness or components which are constructed of pipe material shall be examined in accordance with the applicable procedure for ultrasonic examination of piping systems.

3. REFERENCES

3.1 ASME B&PV Code, Section XI; –1986 Edition.

3.2 ASME B&PV Code, Section V, Article 5; –1986

3.3 80A9053, NES Procedure for Ultrasonic Instrument Linearity Verification

3.4 80A9068, NES Procedure for Certifying Nondestructive Examination Personnel

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with references 3.1 and 3.4.

4.2 It is recommended that examination crews consist of at least two members. At least one member of each crew shall have a minimum certification of Level II. Evaluations shall be conducted by an examiner with a minimum certification of Level II.

4.3 A copy of each examiner's certification summary and current eye test shall be maintained on–site.

4.4 A copy of each examiner's certification summary and current eye test shall be submitted to the Plant Owner or his Agent, prior to performing examinations in accordance with this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT

A pulse echo ultrasonic flaw detection instrument with current linearity which operates within the minimum frequency ranges of 1.0 MHz to 5.0 MHz shall be used. This shall be equipped with a stepped gain control calibrated in units of 2dB or less.

5.2 SEARCH UNITS

A. Prerequisites

1) Search units may contain either single or dual transducer elements. Units with contoured wedges may be used.

2) Angle beam and 0° search unit sizes will be dependent on the size of the area to be scanned, surface configuration, and component geometry.

B. Size

1) Angle beam search unit size shall not exceed 1" diameter or 1"x1".

2) 0° search unit element size shall not exceed 1" diameter or 1"x1".

NOTE: For dual element search units the dimension applies to one of the two elements.

C. Frequency

2.25 MHz is the recommended frequency. Other frequencies may be used if necessary to improve signal to noise ratio.

D. Beam Angle

1. The examination shall generally be performed using a 0° and a nominal 45° angle beam search unit. Other angles are permitted provided the UT Level

III is notified, and the notification documented on the Ultrasonic Calibration Data Sheet (Figure 1).

2. The beam angle in the production material shall be within the range of 35° to 70° perpendicular to the contact surface.

5.3 CABLE

Cables shall have appropriate connectors and may be any convenient length. Examinations shall be performed using the same cable as that used during the calibration.

5.4 COUPLANT

Ultragel – or couplant supplied by the Plant owner.

5.5 CALIBRATION BLOCK(S)

A. Calibration blocks shall be selected and provided by the Plant Owner and shall as a minimum, contain reflectors that enable calibration as required in Section 7 of this procedure.

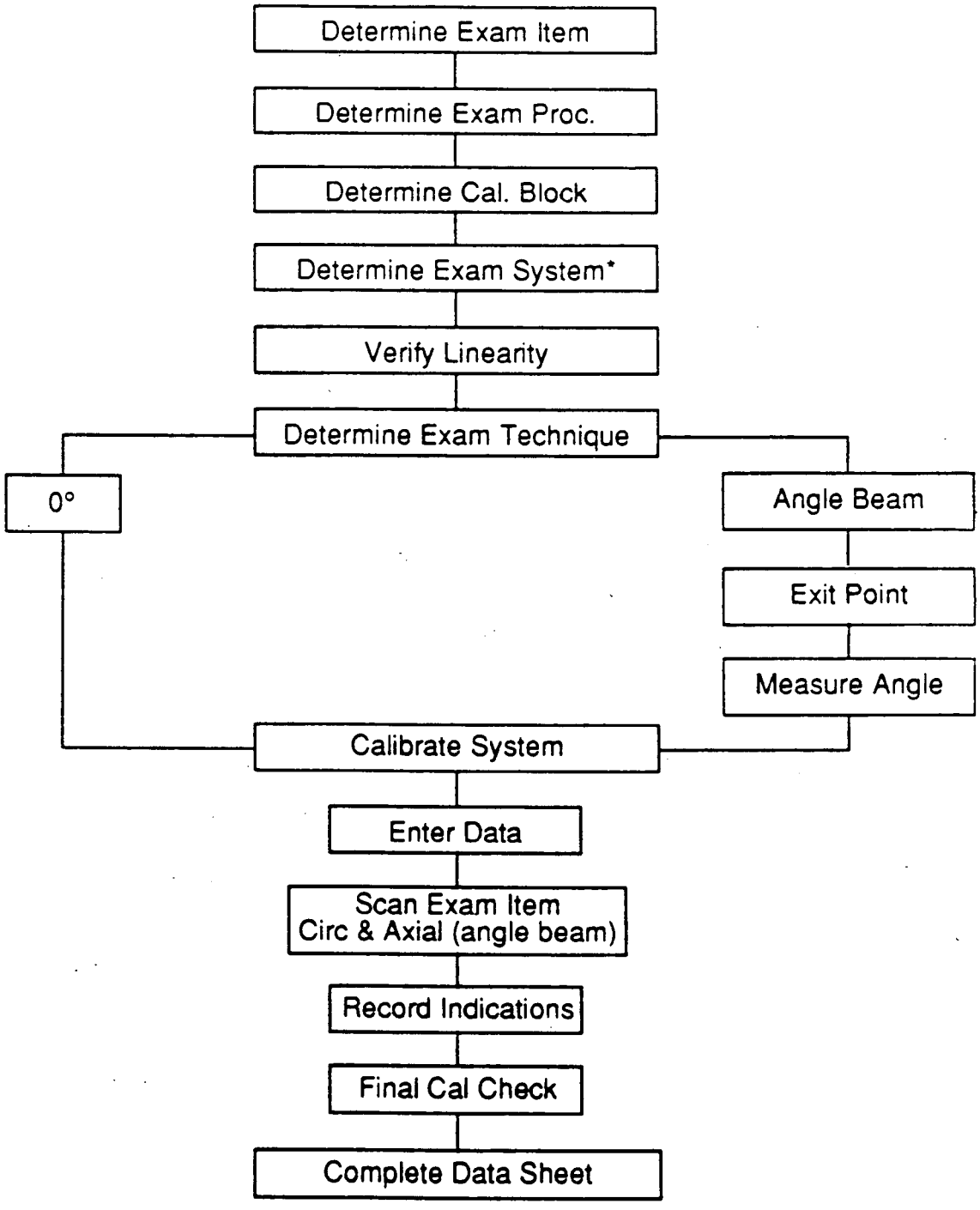
B. IIW Calibration Standards

These may be either full size or miniature IIW standards and shall be fabricated from Carbon Steel or Stainless Steel as applicable.

6. GENERAL PREREQUISITES

The following flow chart describes a typical examination sequence:

EXAMINATION SEQUENCE



*System = Instrument, Transducer, Wedges, and Cable.

6.1 The components to be examined shall be identified/determined by the plant owner.

6.2 Calibration blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the Plant Owner, e.g. the examination surface shall be free of foreign matter which may interfere with Ultrasonic transmission.

6.4 Each weld to be examined shall be identified by the Plant Owner with reference points sufficient to locate the search unit along the weld seam.

NOTE: The examiner shall notify the NES "lead individual" or other designated contact individual when preparation of the scanning surface(s) and identification of reference points are not suitable for the ultrasonic examination.

6.5 Previous examination data provided by the Owner, shall be reviewed by the examiner and the following items should be identified:

(A) Interfering conditions

(B) Weld configuration

(C) Obstructions

(D) Recordable indications

(E) Previous examination technique

(F) Previously measured angle in the component

6.6 The required angle beam method of examination is the 1/2 Vee technique. Where conditions exist that interfere with the scanning of required examination volumes the examination technique shall be modified to examine the maximum volume possible.

NOTE: Modifications to any technique in this procedure shall be approved by a UT Level III. Documentation of this shall be attached to the Ultrasonic Calibration Data Sheet.

6.7 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows:

(1) Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

(2) Screen height and amplitude control linearities should be performed daily (while in use).

6.8 The calibration block surface temperature shall be within 25° F of the component to be examined.

7. CALIBRATION PROCEDURE

7.1 PREREQUISITES

A. Verify that the designated calibration block is correct for the specific item to be examined. Notify the NES "lead" or other designated individual, if a discrepancy is noted.

B. If the calibration block does not contain the reflectors required to perform the calibration techniques identified in this section, the Plant Owner shall be notified and the examination not performed.

C. Calibration shall be performed from the surface (clad or unclad) of the calibration block which corresponds to the component surface to be scanned.

D. The calibration shall be performed with the contoured or contact wedges used during the examination.

E. Dual Search Units

(1) When using dual search units, component thickness and focal distance shall be compatible. Compatibility is determined by the existence of a signal to noise ratio of at least 10:1 when scanning the ID notch in the component calibration block. Where this is not achievable, the UT LIII shall be notified and an explanation documented on the Ultrasonic Calibration Data Sheet (Figure 1).

(2) Half Vee techniques only, shall be used.

F. The search unit actual sound beam exit point shall be determined and marked on the wedge.

G. Measure the wedge exit point to–front–edge dimension and record in the Search Unit Remarks section on the Ultrasonic Calibration Data Sheet (Figure 1). Record as Exit Point to Front Edge: ____".

H. Maximum response from calibration reflectors shall be obtained with the sound beam essentially perpendicular to the axis of the calibration reflector. The center line of the search unit shall be at least 3/4" from the nearest side of the block or pipe. Rotation of the beam into a corner formed by the reflector and the side of the block may produce a higher amplitude signal at a longer beam path; this beam path shall not be used for calibration.

I. Measured beam angle shall be determined by using a Carbon Steel IIW Block or using the reflectors in the component calibration block. Note in the Search Unit Remarks section on the Ultrasonic Calibration Data Sheet when a component calibration block and its identification number is used for search unit angle check(s).

J. Beam spread measurements shall be performed in accordance with Reference 3.2.

K. The examiner should avoid using a sweep calibration that uses only a small portion of the CRT presentation.

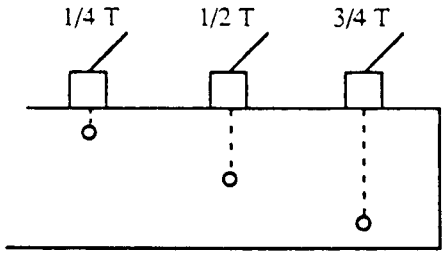
7.2 0° CALIBRATION

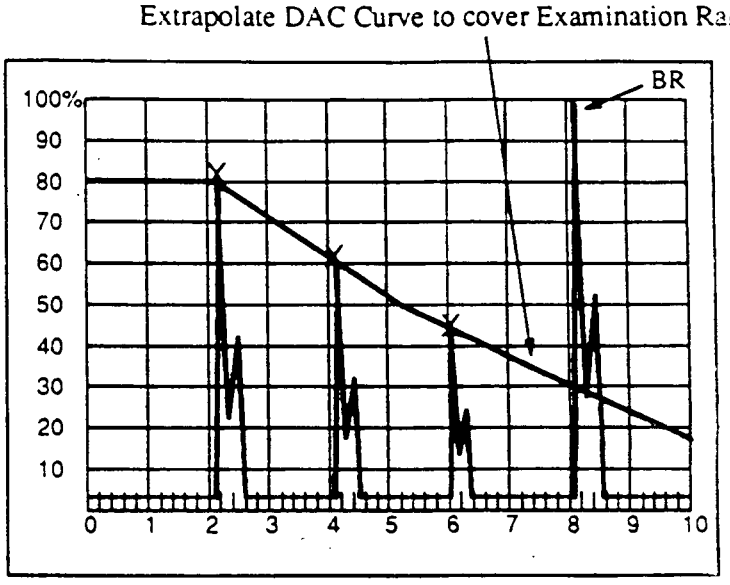
A. Sweep range calibration should be performed using a metal path calibration that will display at least the maximum wall thickness.

B. Distance Amplitude Correction (DAC) calibration shall be performed by obtaining the maximum response from the side drilled hole (SDH) which yields the highest amplitude.

C. Set this signal at 80% ± 5% FSH and mark the peak on the CRT screen. This **establishes reference sensitivity**. Position the search unit for maximum response from the two remaining reflectors and mark their peaks on the CRT screen. Connect the marks and extend the line to cover the required thickness. Record all settings on the Ultrasonic Calibration Data Sheet (Figure 1).

NOTE: The use of an electronic DAC is not permitted.





0° CALIBRATION FOR WRV

7.3 1/2 VEE ANGLE BEAM CALIBRATION (REQUIRED TECHNIQUE)

7.3.1 Unclad Material Calibration

A. Establish sweep range calibration as appropriate using the metal path formulas found in Figure 6.

B. DAC calibration shall be established by using the 1/4T, 1/2T 3/4T and 5/4T SDH.

C. Maximize the signal from the reflector which yields the highest amplitude.

D. Adjust the gain control(s) to provide a signal amplitude of 80% ± 5% FSH and mark its peak on the CRT screen. **This establishes reference sensitivity.**

E. Position the search unit for maximum response from the 3 remaining reflectors and mark their peaks on the CRT screen.

F. Position the search unit on the appropriate calibration surface and maximize the signal from the opposite surface notch. Mark its position and amplitude on the CRT Screen.

G. Connect all the signal amplitude peaks (except for the opposite side notch) marked on the CRT screen. This establishes the DAC. This calibration will permit evaluation to the opposite surface. Record all settings on the Ultrasonic Calibration Data Sheet (Figure 1).

H. A DAC is not required when examining materials less than 1 inch thick. Reference sensitivity shall be established by setting the response from a single calibration reflector to 80% FSH and drawing a straight line at 80% FSH across the CRT.

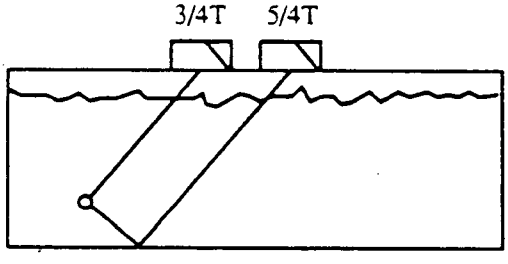
7.3.2 Cladded Material Calibration

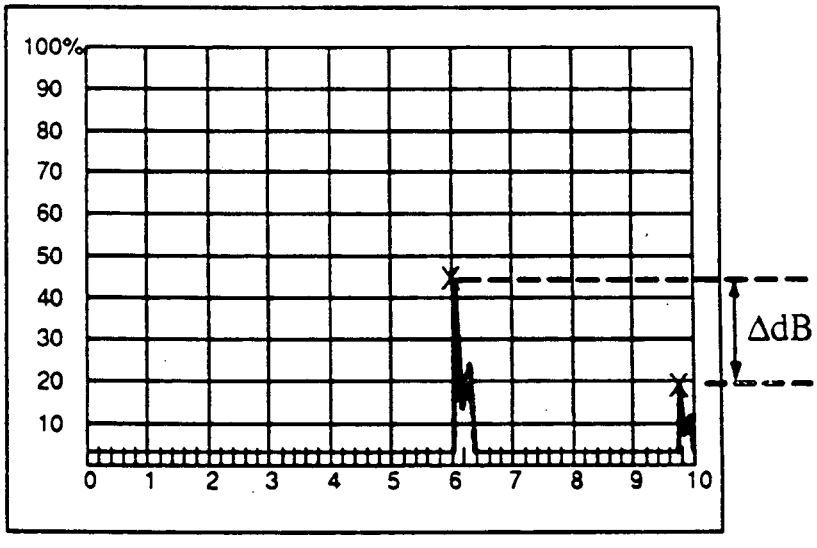
NOTE: When calibrating on clad calibration blocks with the transducer on the UNCLAD surface, anomalies due to acoustic impedance at the clad to base metal interface as well as sound redirection from the clad itself may occur. This condition can affect the shape and slope of the DAC curve after the sound enters and exits the clad. In order to eliminate this condition follow the directions below.

A. Establish sweep range calibration as appropriate, using the metal path formulas found in Figure 6.

B. Place the transducer on the CLAD side of the calibration block and note the Δ dB (difference in dB) between the responses from the 3/4 and the 5/4T holes.

C. Mark the position of the 5/4T hole on the CRT.





D. Place the transducer on the unclad side of the block and construct the DAC curve as instructed below: (E thru N)

E. At this point, DAC calibration shall be established by using the 1/4T, 1/2T and 3/4T holes only.

F. Maximize the signal from the reflector that yields the highest amplitude.

G. Adjust the gain control(s) to provide a signal amplitude of 80% ± 5% FSH and mark its peak on the CRT screen. **This establishes reference sensitivity.**

H. Position the search unit for maximum response from the 1/2T and 3/4T holes and mark their peaks on the CRT screen.

I. Determine the amplitude for the 5/4T hole by positioning the transducer for the 3/4T hole at the maximum amplitude position, then decrease the gain by the Δ dB determined in B above.

J. Mark the height of this signal amplitude on the CRT, at the 5/4T position as established in C above.

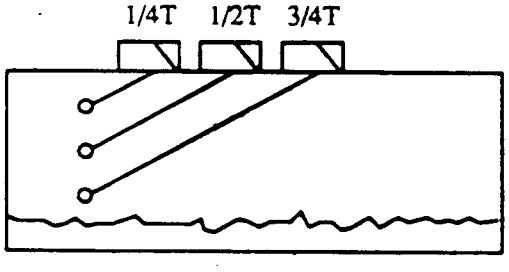
K. Connect the screen marks to provide the DAC curve.

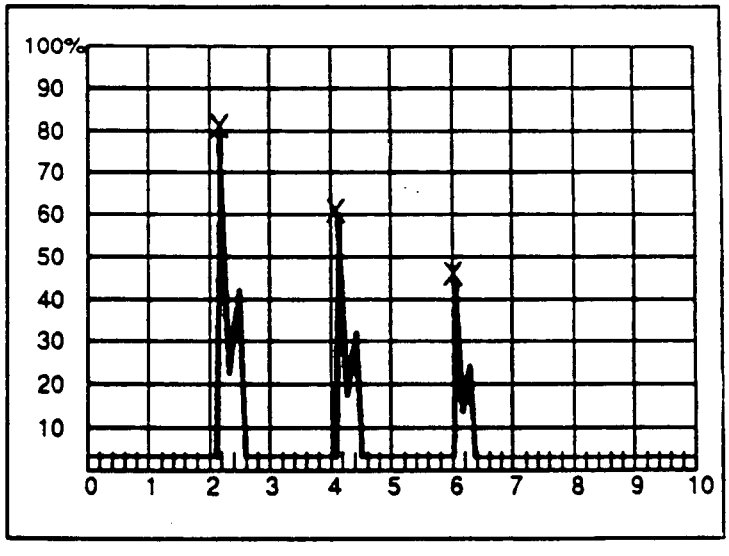
L. This is reference sensitivity.

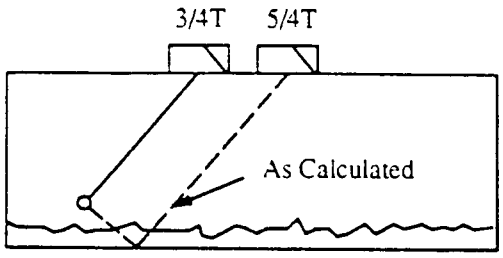
M. Maximize the signal from the opposite surface notch. Mark its position and amplitude on the CRT screen.

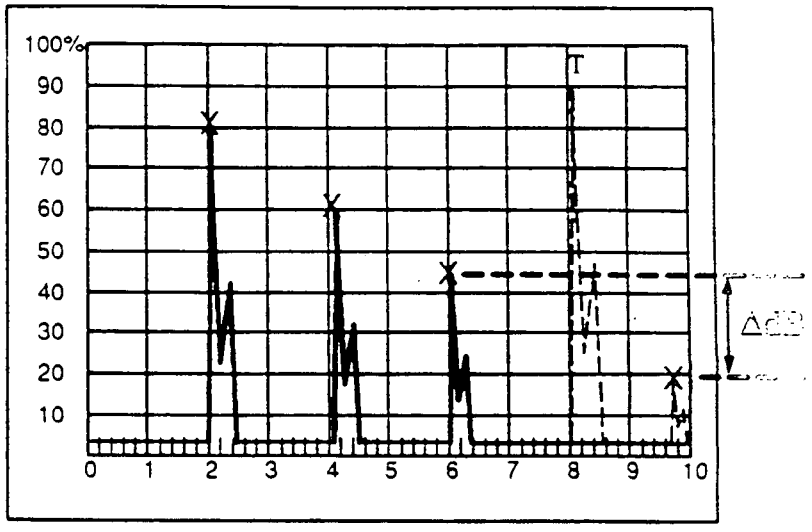
N. Record all settings on the Ultrasonic Calibration Data Sheet (Figure 1).

NOTE: This notch will be used only when evaluating indications at the opposite surface.









7.4 FULL VEE AND 1-1/2 VEE ANGLE BEAM CALIBRATION (SUPPLEMENTAL TECHNIQUE)

A. Establish sweep calibration.

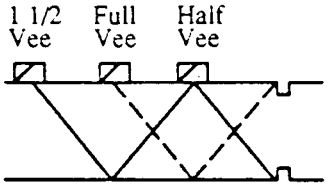
B. Obtain maximized signal responses from the notches and mark the signal response positions on the instrument's CRT screen.

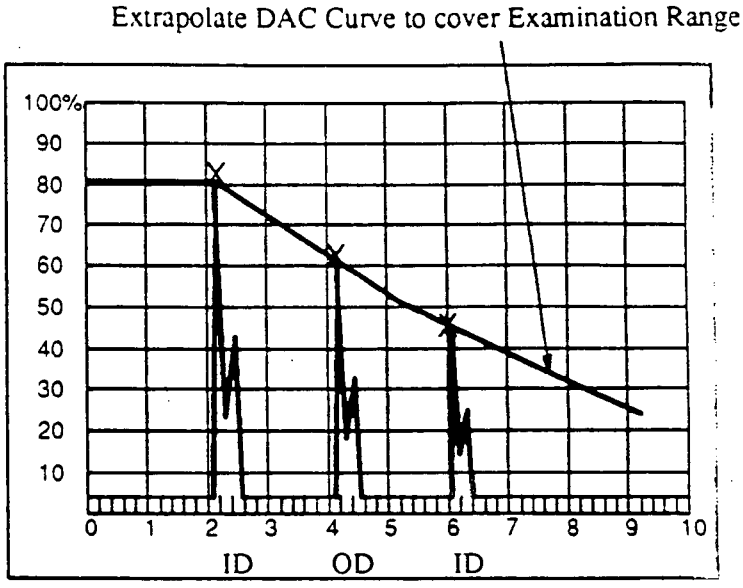
C. Maximize the signal from the notch producing the highest response and set its amplitude to 80% FSH. **This establishes reference sensitivity.**

D. Without changing sensitivity settings, maximize the remaining notch response(s) and mark the peak amplitudes on the CRT screen, and on the Calibration Data Sheet.

E. Plot a DAC curve by connecting the locations (marked on the CRT) with a continuous line extended to cover the full examination range.

F. Upon completion of calibration, ensure that all data and instrument settings are recorded on the Calibration Data Sheet.





1 1/2 VEE CALIBRATION

7.5 DOUBLE DAC

High attenuation, too high a transducer frequency or too small a transducer, may cause the slope of the DAC to fall below 20% FSH within the calibration area of the CRT screen. If this condition is still apparent after changing the size and/or frequency of the transducer, the following correction shall be made:

A. Note the point where the DAC curve drops below the 20% line.

B. Mark this point on the CRT screen and increase the gain by +6db.

C. Mark the new location of the reflector that previously appeared below the 20% line.

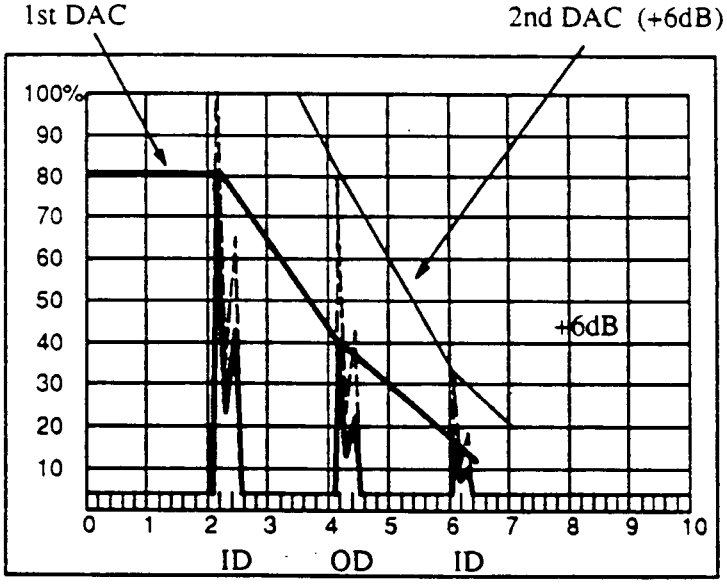
D. Return to the previous reflector that was originally above 20% and mark its new amplitude on the CRT screen.

E. Connect the two new points established in 7.5.C and 7.5.D to establish the second DAC curve.

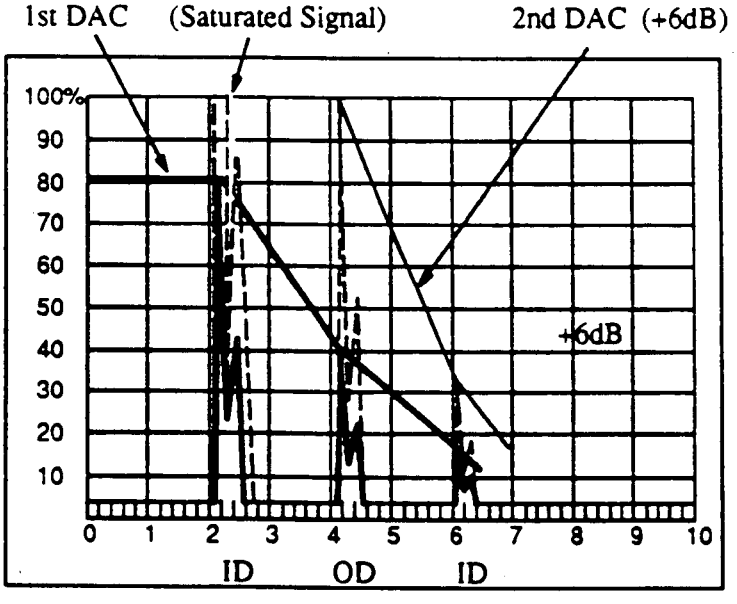
F. Extend the curve if necessary to cover the examination area.

G. Record the new positions and settings on the calibration data sheet.

NOTE: Where the amplitude of the reflector referenced in "D" above increases to a level that exceeds FSH, set this signal amplitude at 100% FSH and create the second DAC using the signal from this reflector as the starting point and the signal from the next reflector as the second point on the DAC. Connect the two points. This is now the second DAC. Record data as in "G" above. (See Example 2 below.)



DOUBLE DAC EXAMPLE 1



DOUBLE DAC EXAMPLE 2

8. EXAMINATION PROCEDURE

NOTE: "System" = Instrument, Transducer, Wedges and same Cable type and length.

8.1 SYSTEM CALIBRATION

Perform the complete ultrasonic examination system calibration, establishing the DAC curve, within one day prior to use of the system for examination of those welds for which the calibration is applicable, and at least once each week during the examination, or at any time that any part of the system is changed.

NOTE: When necessary to replace a cable (even one of the same type and length) system calibration shall be verified. The verification may be delayed until after completion of the examination(s) in progress. However, the requirements of paragraph 8.2 concerning variations in DAC amplitude, sweep and reexamination shall apply.

8.2 SYSTEM CHECK

A. Verify the system calibration (instrument sensitivity and sweep range calibration) at the following intervals:

(1) At the start and finish of examinations for which the calibration applies.

(2) At intervals not to exceed 12 hours. (Recommended 4 hour intervals)

(3) With every change of examination personnel.

(4) If the examiner suspects any malfunction of the UT system.

B. If any point on the DAC curve has decreased 20% or 2db of its amplitude, all data sheets since the last calibration shall be made and recorded invalid. A new calibration shall be made and recorded and the affected examination areas re–examined.

C. If any point on the DAC curve has increased more than 20% or 2db of its amplitude, recorded indications taken since the last valid calibration shall be re–examined with the correct calibration and their values changed on the data sheets. The reason for the changed values shall be noted on the data sheet. No action is required where no recordable indications exist.

D. If any point on the DAC curve has moved on the sweep line more than ± 2 minor divisions of the sweep division reading, correct the sweep range calibration and note the correction on the calibration data sheet. If recordable reflectors are noted on the data sheets, those data sheets shall be considered invalid. A new calibration shall be established and recorded, and the affected areas re–examined.

E. The use of simulators to verify 8.2.A is allowed if used in accordance with the following:

1) Simulator checks must be correlated with the original calibration block during the original calibration.

2) Simulator check shall be made with the entire system.

3) Simulator used shall be completely identifiable on the Calibration Data Sheet (Figure 1).

NOTE: A simulator may be any one or combination of the following:

1) A suitable reflector from an IIW Block

2) A suitable reflector from a Mini IIW Block

8.3 SCANNING – GENERAL REQUIREMENTS

A. Calibrate the system as described in Section 7 as appropriate.

B. Scanning shall be conducted at the primary reference level +6db minimum.

C. Locate the weld on the component.

D. Verify that the surface finish on the component is similar to that of the calibration block used to calibrate the system.

E. Establish a search unit scan path that provides 100% code required volume coverage (or maximizes coverage if 100% coverage is not achievable). Refer to Figures 4, 5 and 6 as appropriate, for examination coverage.

F. Each scan shall be overlapped a minimum of 10% of the element dimension.

G. The rate of search unit movement shall not exceed 6 inches per second.

H. Record all indications as required by Section 10.0. If examination volume is free of recordable indications, this shall be noted on the data sheet.

I. Record all obstructions or other conditions that interfered with the examination.

J. Remove couplant from examination surface.

8.4 SCANNING (0°)

A. The base material in the area through which the angle beam will pass shall be scanned with a 0° prior to the initial angle beam examination to detect areas that might affect interpretation of angle beam results. This is not to be used as an acceptance-rejection examination. The detection of laminar indications shall be recorded on the Ultrasonic Weld Examination Sheet (Figure 2), and considered when conducting the angle beam scans.

NOTE: If it can be proven (previous data) that this examination was conducted and laminar reflectors were not found, then this specific examination need not be performed.

The Weld Required Volume (WRV) shall examined with a 0° search unit in order to detect planar reflectors (a reflector that lies in a plane which is more than 10° from a plane parallel to the scanning surface of the component). This examination shall be performed on the entire volume of weld and adjacent base material to the extent required in Figures 4 or 5.

8.5 SCANNING (ANGLE BEAM)

8.5.1 Scanning for Reflectors Oriented Parallel to the Weld

1. The angle beam search units shall be aimed at right angles to the weld axis, with the search unit manipulated so that the ultrasonic beams pass through all of the weld metal.

2. The weld shall be completely scanned using two angles in both directions.

3. The adjacent base metal in the examination volume must be completely scanned from one direction. Refer to Figures 4 and 5.

4. Where the ultrasonic beams are directed essentially normal to the plane of the weld (parallel to the surface of the material, as when the examination is conducted from the nozzle bore or flange face), beam angles sufficient to provide complete coverage of the weld from one direction shall be acceptable.

5. Record all obstructions or other conditions that interfere with the examination.

8.5.2 Scanning for Reflectors Oriented Transverse to the Weld

1. The angle beam search units shall be aimed parallel to the axis of longitudinal and circumferential welds.

2. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume.

3. Scanning shall be done in two directions 180° to each other to the extent possible, using two different angles.

4. Obstructed areas shall be examined from at least one direction.

9. RECORDING

9.1 PREREQUISITES

A. All indications shall be recorded at reference sensitivity.

B. The determination that an indication is from a flaw or is of geometric or metallurgical origin shall be made by one or more of the following methods:

1) Plot the indication per paragraph 9.3.C.

2) Use of other NDE methods or techniques.

3) Comparison with fabrication drawings or weld preparation drawings.

C. When an indication is required to be recorded, the data required in Figure 3 shall be completed.

D. Terminology used in this procedure:

- Flaw – a residual fabrication or serviced–induced reflector (e.g., slag, crack, etc.)
- Geometric reflector – a weld root, counterbore, weld crown, etc.
- Metallurgical reflector – a weld to base metal interface, grain structure, etc.

9.2 RECORDING CRITERIA FOR INTERFERING LAMINAR REFLECTORS

A. Record all laminar reflectors interfering with angle beam examination by recording all areas giving signal amplitudes equal to or greater than the remaining back reflection.

B. The location, size and depth of the laminar reflector(s) shall be plotted on a sketch. This sketch shall be attached to the Ultrasonic Indication Report Sheet (Figure 3) for use during the angle beam examinations.

9.3 RECORDING CRITERIA FOR GEOMETRIC AND METALLURGICAL REFLECTORS

A. Geometric and metallurgical reflectors shall be recorded at a representative location (maximum amplitude point) when the amplitude equals or exceeds 50% DAC.

B. Previously recorded geometric and metallurgical reflectors shall be verified at the previous recording level and coordinates. Indications need not be re-plotted but shall be referenced on the new data sheet by previous data sheet number and date or by attaching the previous data sheet to the new data package.

C. Plot and verify the indications as follows:

1) Record maximum amplitudes as:

a) a percent of the DAC curve,

b) sweep readings to the reflector,

c) search unit locations and,

d) sound beam direction.

2) Plot location of reflector at a representative position on a full scale cross-section profile drawing showing the source of the indication and all other relative geometric conditions.

9.4 RECORDING CRITERIA FOR NON-GEOMETRIC INDICATIONS

A. Indications shall be recorded when the amplitude equals or exceeds 50% DAC.

B. All indications that produce a response greater than 100% of DAC will require evaluation in terms of the acceptance-rejection standards of IWA-3000. (Reference 3.1)

C. The length of recordable indications shall be measured between points which yields amplitudes at 100% DAC.

D. The through-wall dimension of recordable indications shall be measured between points which yield amplitudes at 100% DAC.

E. Other techniques should be attempted to provide a comparison for establishing the most accurate throughwall dimension.

F. When the ultrasonic signal response(s) being obtained from a reflector is, in the judgment of the examiner, indicative of a crack, then the reflector shall be recorded regardless of maximum amplitude obtained.

NOTE: Evaluation of flaw indications shall be performed by personnel with a minimum certification of UT Level II.

9.5 ACCEPTANCE CRITERIA

Acceptance of indications shall be determined by evaluation to the requirements of ASME Boiler and Pressure Vessel Code, Section XI, Article IWA– 3000.

10. EXAMINATION RECORDS

10.1 NES shall be responsible for submitting to the Plant Owner, or his Agent, a complete set of examination records.

10.2 Figure 1 shall be completed by examiner(s) at the time of calibration. Figures 2 and 3 shall be completed by the examiner(s) as required.

10.3 The Examiner(s) shall sign the completed data sheet(s), noting applicable NDE Certification Level(s).

10.4 NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

11. ATTACHMENTS

11.1 FIGURE 1 – Ultrasonic Calibration Data Sheet

11.2 FIGURE 2 – Ultrasonic Weld examination sheet

11.3 FIGURE 3 – Ultrasonic Indication Report Sheet

11.4 FIGURE 4 – Class 1 Examination Volume and Scan path Calculations

11.5 FIGURE 5 – Class 2 Examination Volume and Scan Path Calculations

11.6 FIGURE 6 – Table 1 (Metal Path Calculations)

11.7 FIGURE 7 – Angle beam Verification Block – 1.0 inch presentation

11.8 FIGURE 8 – Angle beam Verification Block – 2.5 inch presentation

11.9 FIGURE 9 – Angle beam Verification Block – 5.0 inch presentation

11.10 FIGURE 10 – Angle beam Verification Block – 10.0 inch presentation

DATA SHEET NO. _____

PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____

REV. _____

CHANGE NO. _____

INSTRUMENT

Model _____
Serial No. _____
Sweep Length _____ Delay _____
Range _____
Gain (coarse) _____ dB
Gain (fine) _____ dB
Reference Sensitivity _____ dB
Remarks: _____

SEARCH UNIT

Serial No. _____
Size _____
Frequency _____ MHz
Mode _____
Nom. Angle _____ °
Measured Angle _____ °
Cable Type _____
Cable Length _____
Remarks: _____

CALIBRATION BLOCK

No. _____
"T" _____ Dia. _____
Temperature _____ ° F
Thermometer S/N _____

CALIBRATION

0° ☐ Axial ☐ Circ. ☐
Metal Path ☐ Depth ☐
Each Major Screen Div. = _____
Remarks _____

COUPLANT

Brand _____
Batch No. _____

VERTICAL LINEARITY

AMPLITUDE % FSH

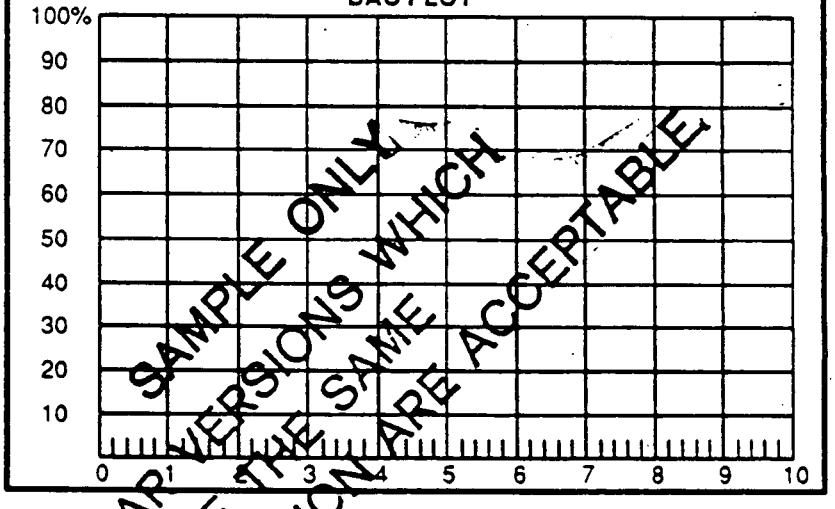
	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	–6	
80	–12	
40	+6	
20	+12	

CAL. CHECKS	TIME
INITIAL CAL.	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	

DAC PLOT



REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC CALIBRATION DATA SHEET
FIGURE 1

DATA SHEET NO. ____________
PAGE ______ OF ______
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM ____________
ISO/DWG. NO ________ REV. ______
THERMOMETER S/N ____________
COMPONENT TEMP. ________ ° F

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SAMPLE ONLY
SIMILAR VERSIONS WHICH
REQUIRE THE SAME
INFORMATION ARE ACCEPTABLE

EXAMINERS:
1 ____________ LEVEL ______ DATE ______
2 ____________ LEVEL ______ DATE ______

REVIEWERS:
1 ____________ LEVEL ______ DATE ______
2 ____________ LEVEL ______ DATE ______
3 ____________ LEVEL ______ DATE ______

nes NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC EXAMINATION SHEET
FIGURE 2

FORM #NES 205 7/90

EXAM ITEM

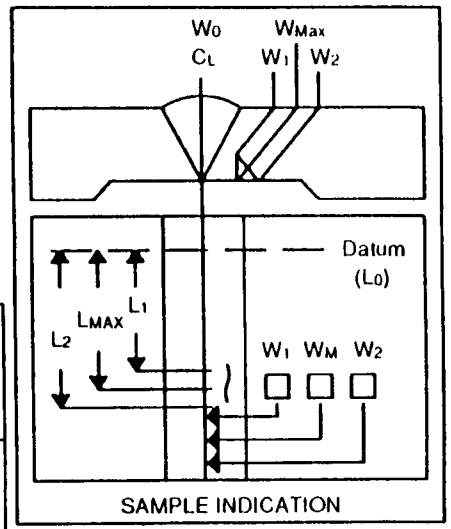
ISO/DWG. NO.

ULTRASONIC INDICATION REPORT SHEET

- ☐ PIPING WELDS
- ☐ FERRITIC VESSELS ≥ 2" T *
- ☐ OTHER _____

DATA SHEET NO. _____

PAGE _____ OF _____



SAMPLE INDICATION

SEARCH UNIT ANGLE _____° W0 LOCATION _____ L0 LOCATION _____

MP	Metal Path	W max	Distance from W0 to S.U. at maximum response
RBR	Remaining Back Reflection	W1	Distance from W0 at 50% of DAC (fwd)
L	Distance from Datum	W2	Distance from W0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX MP	FWD 50% DAC* W1	FWD 50% DAC* MP	BACKWARD 50% DAC* W2	BACKWARD 50% DAC* MP	L1 50% DAC	L max	L2 50% DAC	RBR amp	S.U. Loc.	REMARKS

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

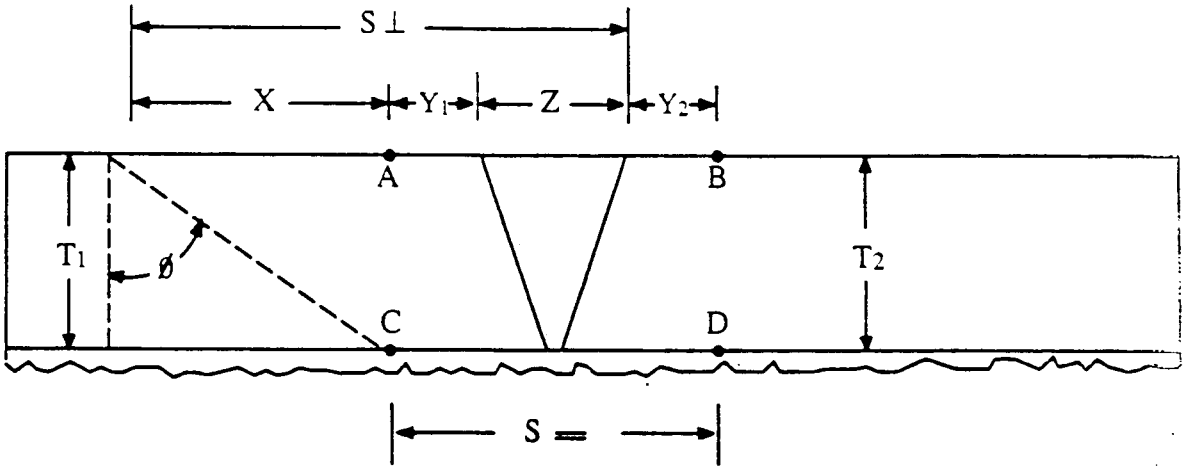
EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC INDICATION REPORT SHEET
FIGURE 3

ASME B&PV SECTION XI REQUIRED
EXAMINATION VOLUME
CLASS 1 COMPONENTS



Scan area as required to examine volume A–B–C–D
Scan Path Calculations

Perpendicular Coverage:

S⊥	=	X + Y_1 + Z
X	=	T_1 x Tan
Y_1	=	1/2 Material Thickness
Z	=	Width of Weld Crown
0	=	Examination Angle

Example:

T_1	=	2″
0	=	60 degrees
X	=	2″ x Tan 60 = 3.47″
Y_1	=	1
Z	=	1.25
S⊥	=	3.47 + 1 + 1.25 = 5.72″

Drawing shows one sided ⊥ scan only. Weld must be examined from both sides.

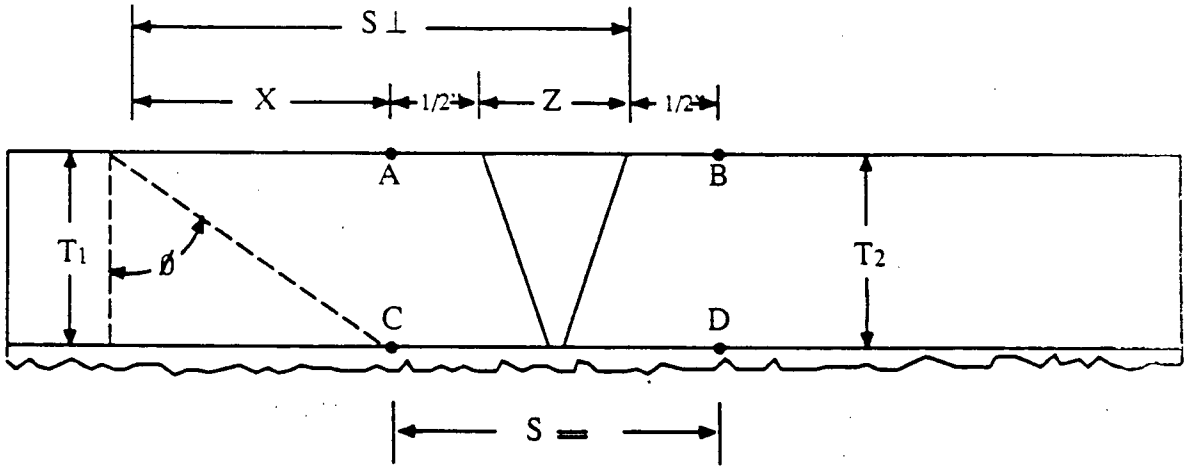
Parallel Coverage:

S═	=	Y_1 + Z + Y_2
Y_1	=	1/2 T_1
Z	=	Width of Weld Crown
Y_2	=	1/2 T_2

For examination volumes not depicted here refer to the referencing code.

EXAMINATION VOLUME CLASS 1 VESSELS
FIGURE 4

ASME B&PV SECTION XI
REQUIRED EXAMINATION VOLUME
CLASS 2 COMPONENTS



Scan area as required to examine volume A–B–C–D
Scan Path Calculations

Perpendicular Coverage:

S⊥	=	X + 1/2" + Z
X	=	T_1 x Tan 0
Z	=	Width of Weld Crown
0	=	Examination Angle

Example:

T_1	=	2"
0	=	60 degrees
X	=	2" x Tan 60 = 3.47"
Z	=	1.25
S⊥	=	3.47 + .5" + 1.25" = 5.22"

Drawing shows one sided ⊥ scan only. Weld must be examined from both sides.

Parallel Coverage:

S═	=	1/2" + Z + 1/2"
Z	=	Width of Weld Crown

For examination volumes not depicted here refer to the referencing code.

EXAMINATION VOLUME CLASS 2 VESSELS
FIGURE 5

FORMULA FOR DETERMINING METAL PATH

VEE PATH	45°	60°	70°
1/2	T X 1.414	T X 2.0	T X 2.923
3/4	T X 2.121	T X 3.0	T X 4.386
1, 1/2	T X 4.242	T X 6.0	T X 8.769

For determining other metal paths when using other angles, calculate as follows:

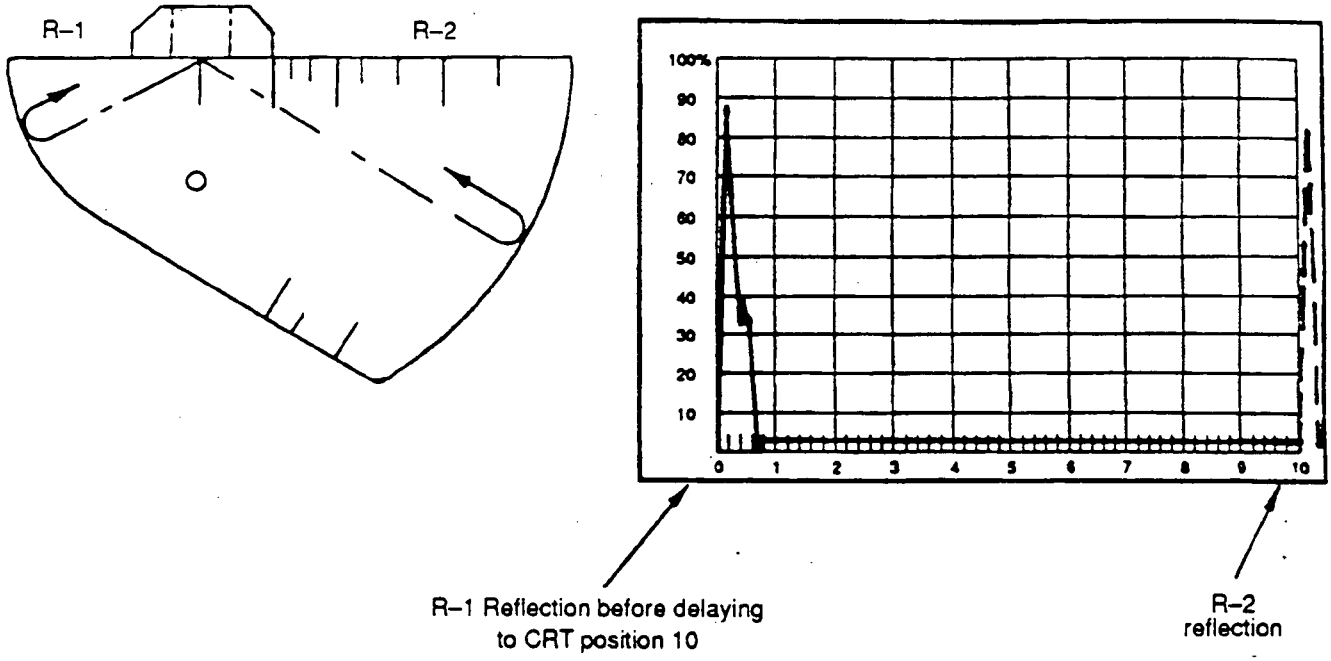
(1) 1/2 Vee — Constant = 1/cos angle

(2) 3/4 Vee — Constant – 1/cos angle x 1.5

(3) 1, 1/2 Vee — Constant – 1/cos angle x 3.0

Constant x "T" = Metal Path for appropriate Vee path.

TABLE 1 (METAL PATH CALCULATION)
FIGURE 6



METAL PATH CALIBRATION FOR A 1" CRT PRESENTATION

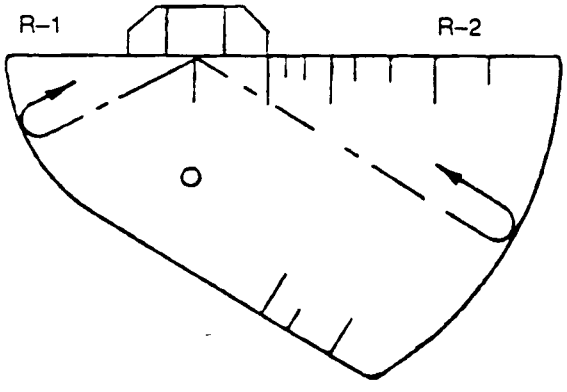
With the search unit coupled to the Miniature IIW Block:

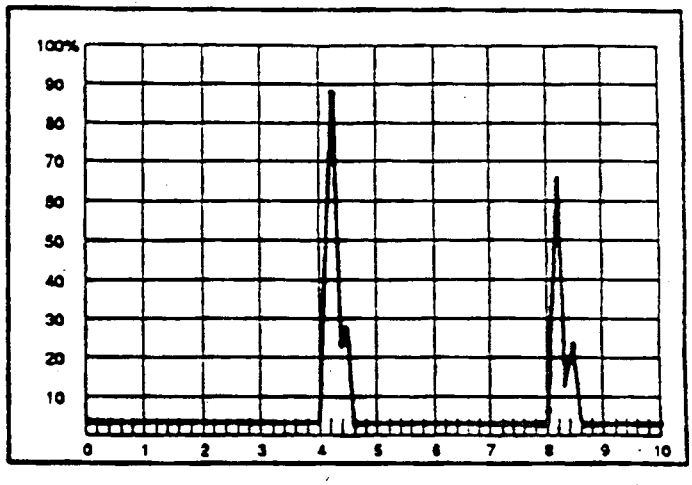
1) Maximize the signal from the 1" radius (R–1).
2) With the Sweep and Delay controls, align this signal at position 10 on the CRT (CRT 10).
3) With the Delay control, move this signal to CRT 0.
4) Maximize the signal from the 2" radius (R–2).
5) With the Sweep control, align this signal at CRT 10.
6) Repeat steps 1 thru 5 until the respective signals are aligned at CRT 0 and CRT 10.
7) With the Delay control only, move the R–1 signal across the screen to position CRT 10.
8) Make no further adjustments to sweep or delay controls.

The instrument is now calibrated for 1" metal path. Each Major Division = 0.10".

ANGLE BEAM VERIFICATION BLOCK 1.0" PRESENTATION

FIGURE 7





METAL PATH CALIBRATION FOR A 2.5" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block:

9) Maximize the signal from the 1" radius (R–1).

10) With the Sweep and Delay controls, align this signal at position 4 on the CRT (CRT 4).

11) Maximize the signal from the 2" radius (R–2).

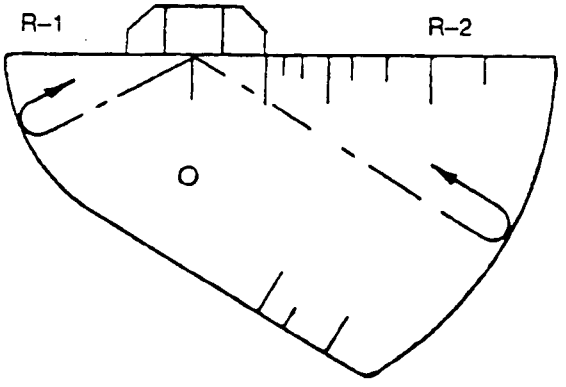
12) With the Sweep and Delay controls, align this signal at CRT position 8.

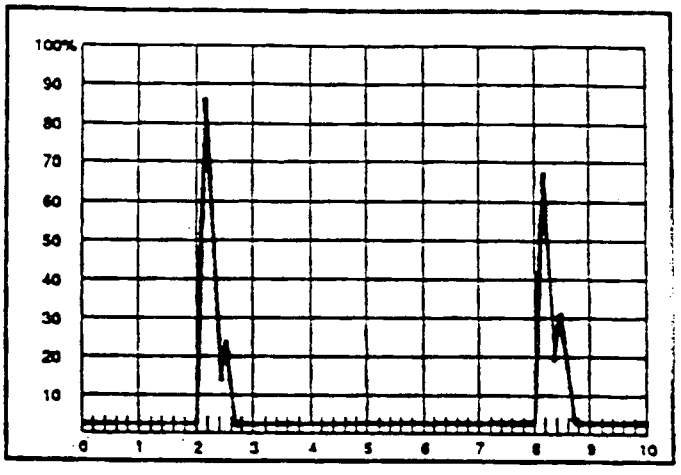
13) Repeat steps 2 and 4 until the respective signals are aligned at CRT position 4 and CRT position 8.

The instrument is now calibrated for 2.5" metal path. Each Major Division = 0.25".

ANGLE BEAM VERIFICATION BLOCK 2.5" PRESENTATION

FIGURE 8





METAL PATH CALIBRATION FOR A 5″ CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

14) With the transducer facing the 1″ radius, maximize the signals from the 1″ (R–1) and 2″ radius (R–2).

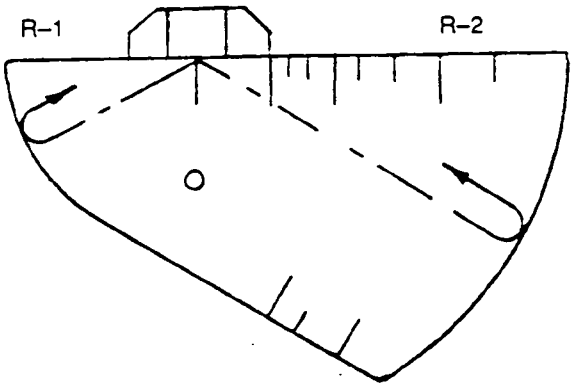
15) With the Sweep and Delay controls, align these signals at positions 2 and 8 respectively.

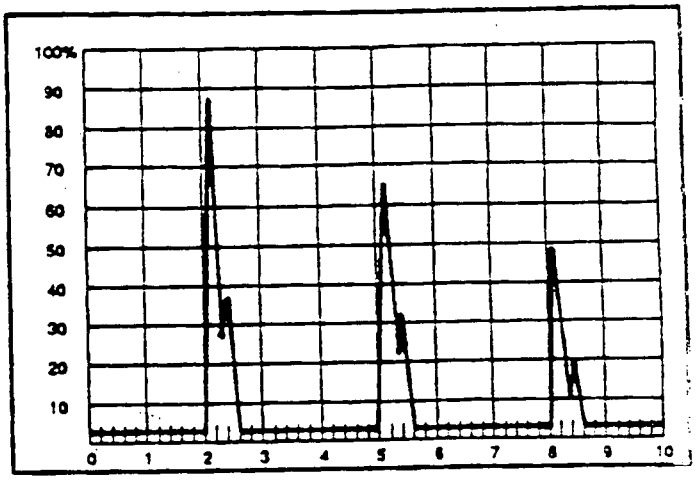
16) Face the transducer at the 2″ radius (R–2), the signal from R–2 should appear at position 4 on the CRT.

The instrument is now calibrated for 5.0″ metal path. Each Major Division = 0.50″.

ANGLE BEAM VERIFICATION BLOCK 5.0″ PRESENTATION

FIGURE 9





METAL PATH CALIBRATION FOR A 10″ CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

17) With the transducer facing the 2″ radius, maximize the signal from the 2″ radius (R–2) and align this signal at CRT position 2.

18) Adjust the gain control if necessary and observe the signals that appear from the 5″ and 8″ metal paths. (These metal pats and signals result from the sound making successive "round trips" from each radius).

19) With the Sweep and Delay controls, align these signals at CRT positions 5 and 8 respectively.

The instrument is now calibrated for 10.0″ metal path. Each Major Division = 1.0″.

ANGLE BEAM VERIFICATION BLOCK 10.0″ PRESENTATION
FIGURE 10

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

FOR INFORMATION ONLY

SPECIAL PROCEDURE

SP-1220

PSI/ISI EXAMINATION AREAS AND VOLUMES

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/17/93

Expiration Date 2/16/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 5/4/93
Manager / Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 45	0

PSI/ISI EXAMINATION

AREAS AND VOLUMES

FOR

H.B. ROBINSON

ect Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. - SIGNATURE - DATE

REV NO	PREPARED BY	Level III	Proj. Mgr.	Gen. Mgr.	
0	K. Birsen			3/20/02	
1	K. Birsen	3/6/02	3/6/02	3/6/02	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
	03/06/92	24	FIGURE 18 CORRECTED TYPO	Kenneth Brown
		25	FIGURE 19 CORRECTED TYPO	
			INCORPORATED CP&L COMMENTS	
			REFER TO CRA #8296	

1. PURPOSE

This procedure describes the areas of welds and/or components that are subject to surface and/or volumetric examinations as required by ASME B&PV Code, Section XI.

2. SCOPE

1. This procedure contains the minimum examination area requirements for surface examination, (Magnetic Particle or Liquid Penetrant) and Volumetric Examination (Ultrasonic or Radiography). When project specifications invoke or modify these requirements, the requirements of the subject project specifications shall govern provided the minimum requirements of this procedure are met.

   Deviations that compromise code minimum requirements shall be authorized only by published code case.

2. This procedure applies to all PSI/ISI surface or volumetric examinations performed to the requirements of ASME B&PV Code, Section XI, 1977 Edition with Addenda through Winter 1979, 1980 Edition with Addenda through Winter 1982, 1983 Edition with Addenda through Summer 1983, and 1986 Edition.

3. It is the responsibility of the examiners to insure that the area of interest is examined to the requirements of this procedure.

3. REFERENCES

ASME B&PV Code, Section XI, 1977 Edition with Addenda through Winter 1979, 1980 Edition with Addenda through Winter 1982, 1983 Edition with Addenda through Summer 1983, and 1986 Edition.

4. PERSONNEL REQUIREMENTS

Not applicable.

5. EQUIPMENT & MATERIAL REQUIREMENTS

Not applicable.

6. PREREQUISITES

The owner shall be responsible for the following:

1. Accessibility to the areas of interest, such as scaffolding, removal of insulation (for welds the insulation will be removed from the toe back 2T + 2 inches or 6 inches for pipe up to 2 inches thick and 8 inches from toe on pipe over 2 inches thick.)
2. Test surface preparation (suitable condition for surface or volumetric examination).
3. Lighting, electricity, water, air.
4. Moving or lifting devices.
5. Pre and post examination cleaning.

7. PROCEDURE

The area of interest shall be as designated below:

1. Class I Components
   a. Vessel shell circumferential weld joints; see Figure 1.
   b. Vessel shell longitudinal weld joints; see Figure 2.
   c. Spherical vessel head circumferential and meridional weld joints; see Figure 3.
   d. Shell–to–flange weld joint; see Figure 4.
   e. Head–to–flange weld joint; see Figure 5.
   f. Tube sheet–to–head weld joints; see Figure 6.
   g. Nozzle in shell or head; see Figures 7, 8, 9, and 10.
   h. Similar and dissimilar metal welds in components and piping; see Figures 11 and 12. (Also see Note 1 below).
   i. Pipe branch connections; see Figures 13, 14 and 15.

j. Closure stud and threads in flange stud hole; see Figure 16.

k. Integral attachment welds; see Figures 17, 18 and 19.

l. Pump casing weld; see Figure 20.

m. Valve body welds; see Figure 21.

n. Control rod drive housing welds; see Figure 22.

NOTE 1: For pressure retaining welds in piping, the examination shall include at least one pipe–diameter length but need not be more than 12 inches of each longitudinal weld intersecting the circumferential weld to be examined.

2. Class II Components

a. Vessel circumferential welds; see Figure 23.

b. Tube sheet–to–shell circumferential welds; see Figure 24.

c. Nozzle to vessel welds; see Figures 25, 26 and 27.

d. Integrally welded attachments; see Figure 28.

e. Pressure retaining bolting; see Figure 29.

f. Welds in piping; see Figure 30. (Also see Note 2 below).

g. Welds in pump casings and valve bodies; see Figure 31.

h. Pipe branch connection welds; see Figures 32, 33, 34, 35 and 36.

NOTE 2: The examination shall include at least a 2.5t length of each longitudinal weld intersecting the circumferential weld to be examined.

3. Surface examination of studs, nuts, and bolts shall include the entire outside surface of the part being examined unless specified otherwise.

4. Base material repair areas shall include the repair area and a band around the area that is three times the thickness of the component repaired (3T) in width but need not exceed 10 inches in width.

5. For welds in Class 3 or Class MC Components that may require volumetric or surface examination, the weld and 1/2 inch on all sides shall be examined.

6. For components that may not be covered by the Figures, the area of interest shall be the weld (or area of concern) plus 1/2T or 1/2 inch, whichever is greater.

8. RECORDING/EVALUATION CRITERIA

Not applicable.

9. EXAMINATION RECORDS

Not applicable.

10. ATTACHMENTS

See Figures 1 through 36.

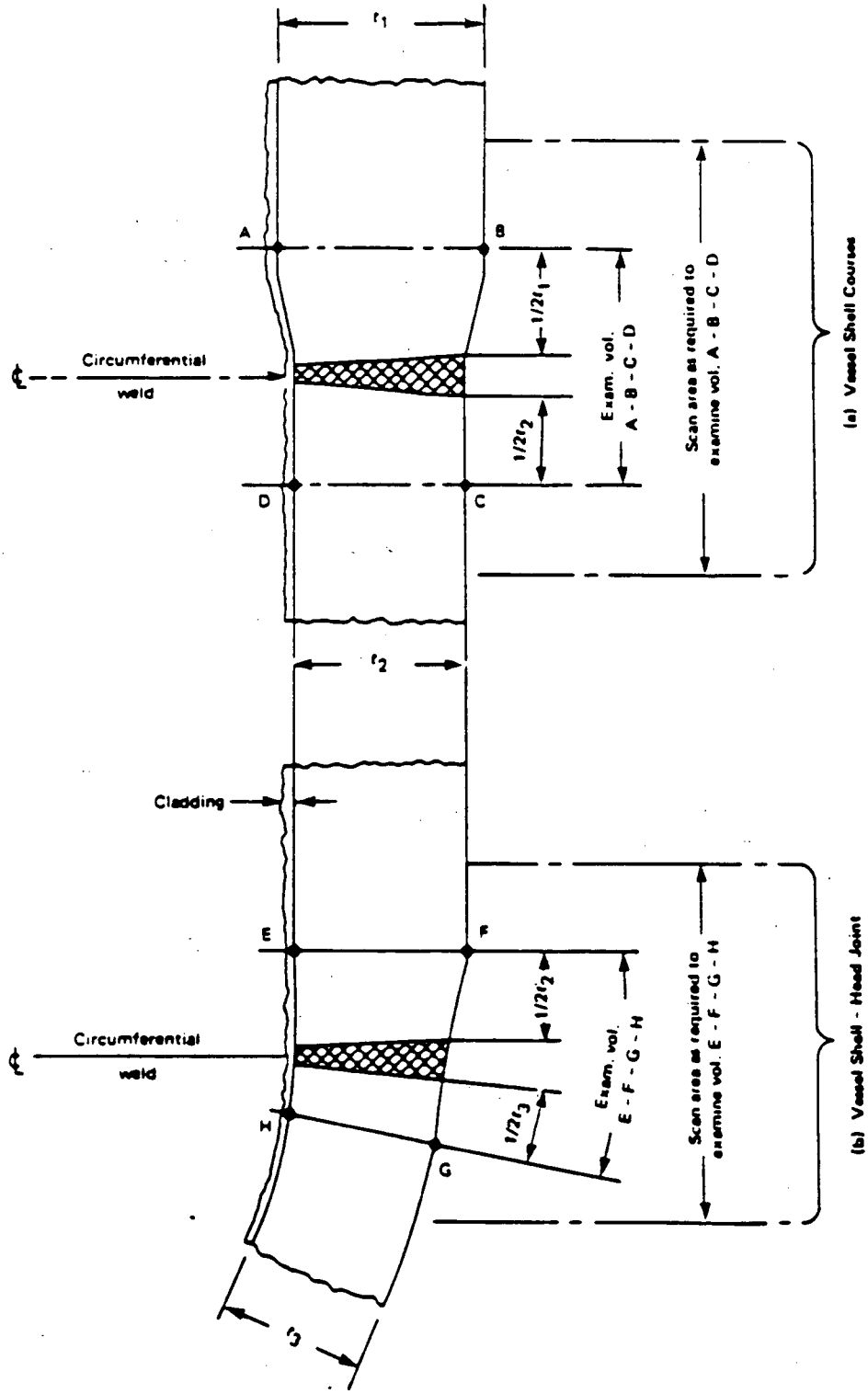


FIGURE 1

VESSEL SHELL CIRCUMFERENTIAL WELD JOINTS

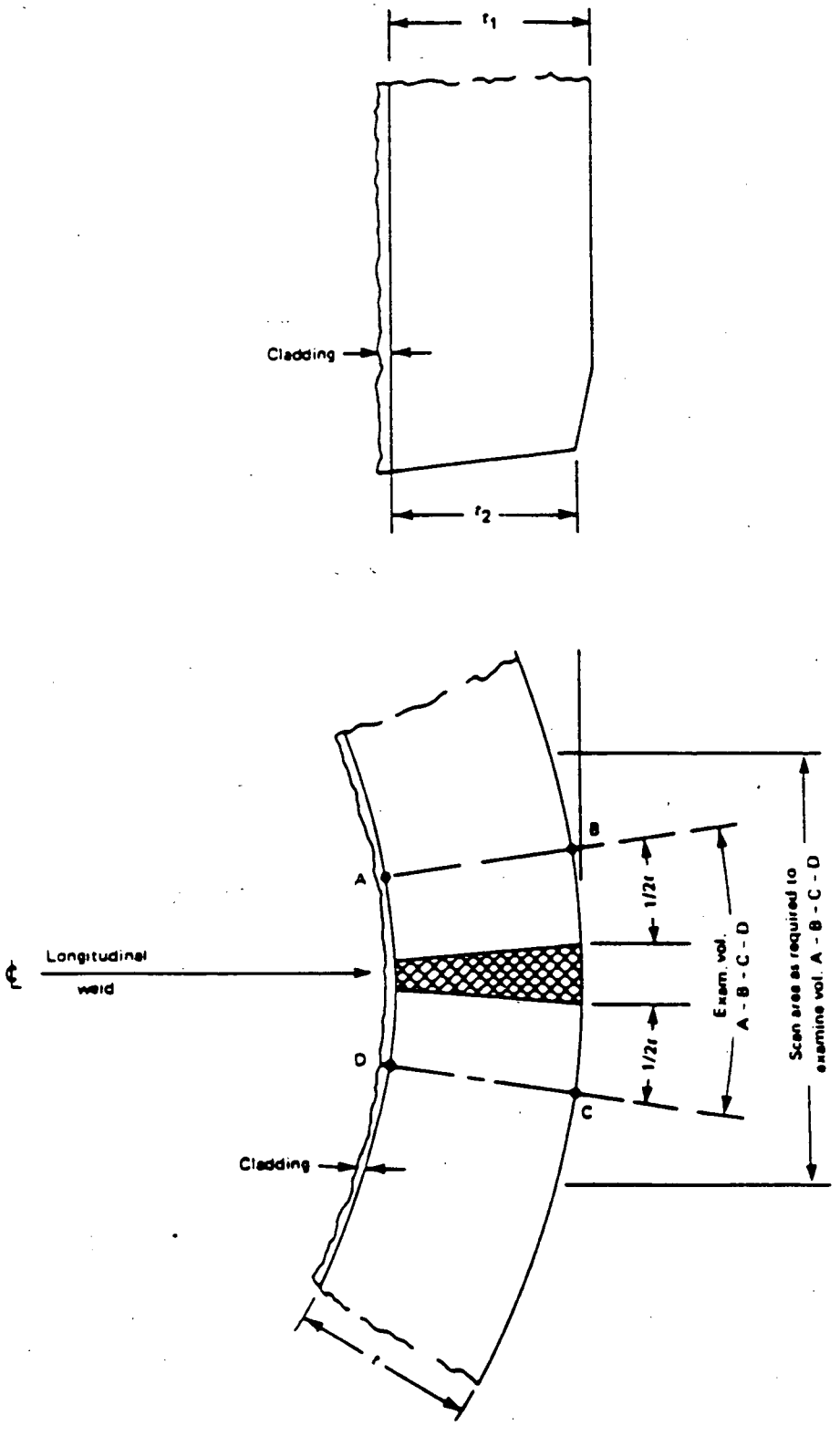


FIGURE 2

VESSEL SHELL LONGITUDINAL WELD JOINTS

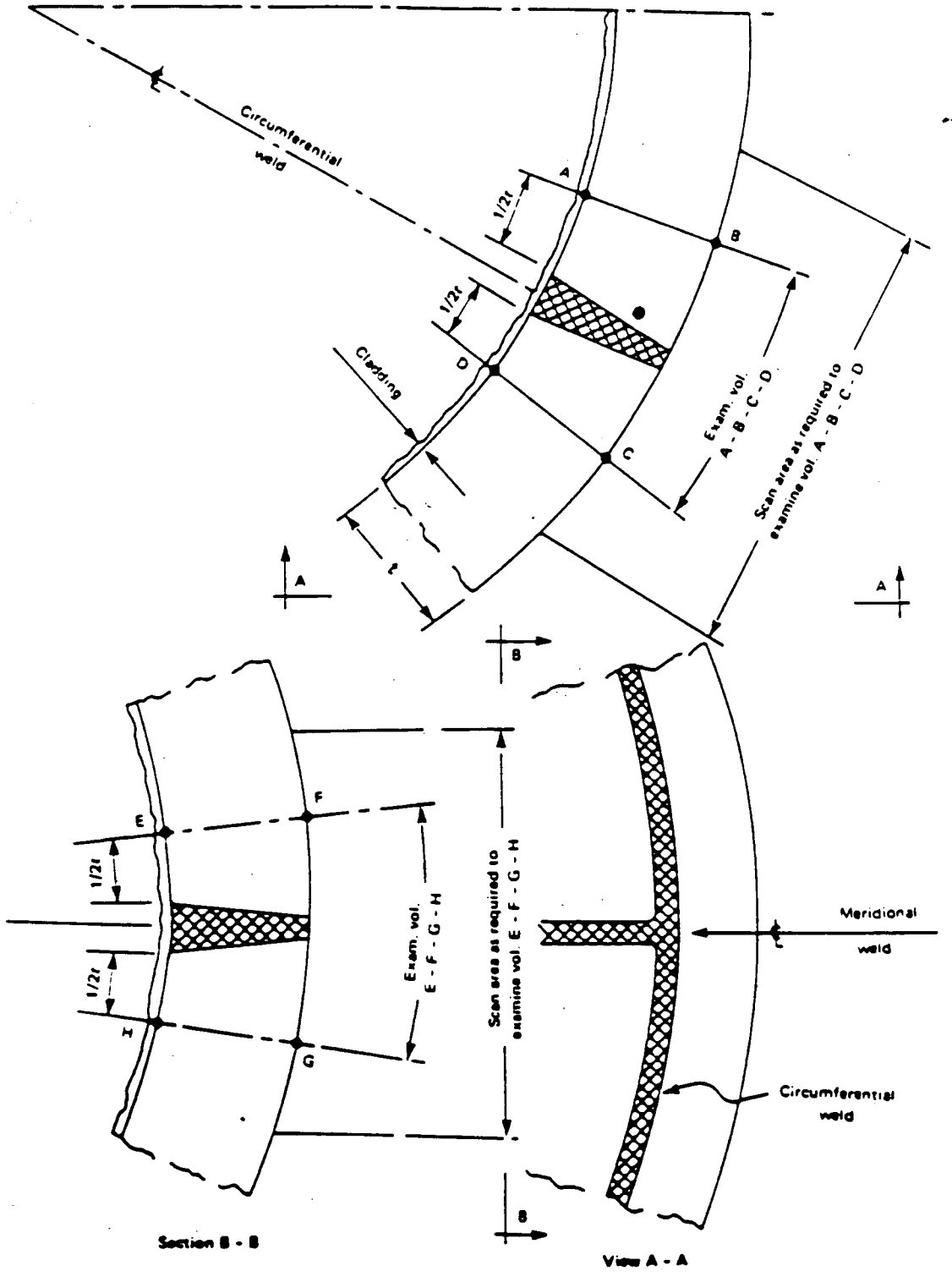


FIGURE 3
SPHERICAL VESSEL HEAD CIRCUMFERENTIAL
AND MERIDIONAL WELD JOINTS

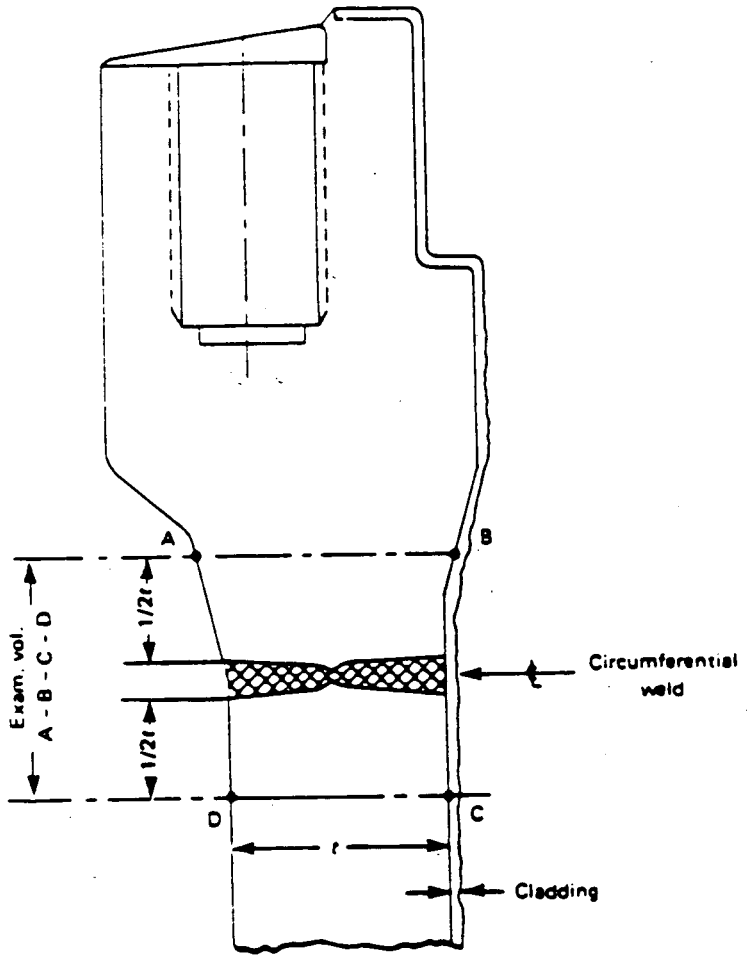


FIGURE 4
SHELL-TO-FLANGE WELD JOINT

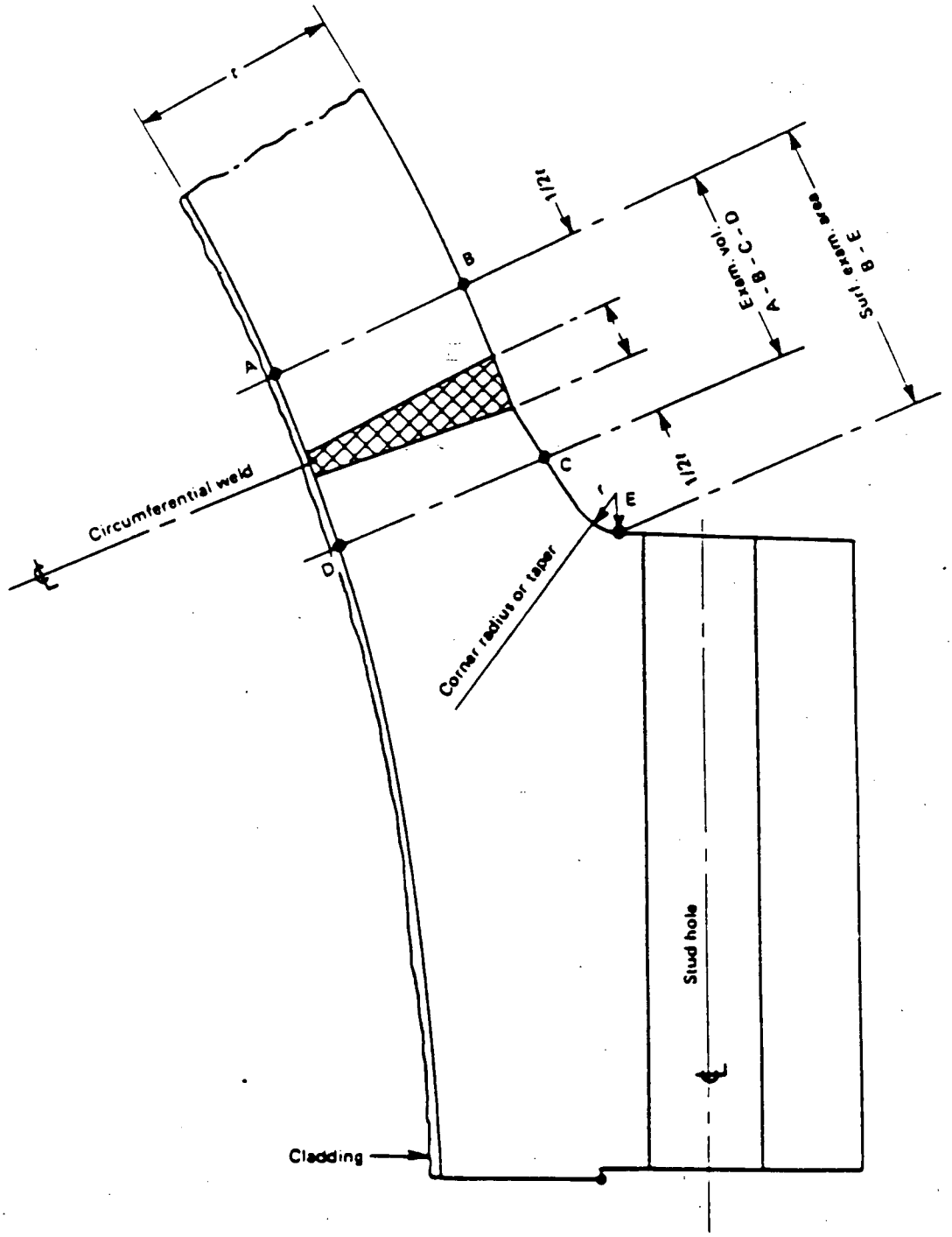


FIGURE 5
HEAD-TO-FLANGE WELD JOINT

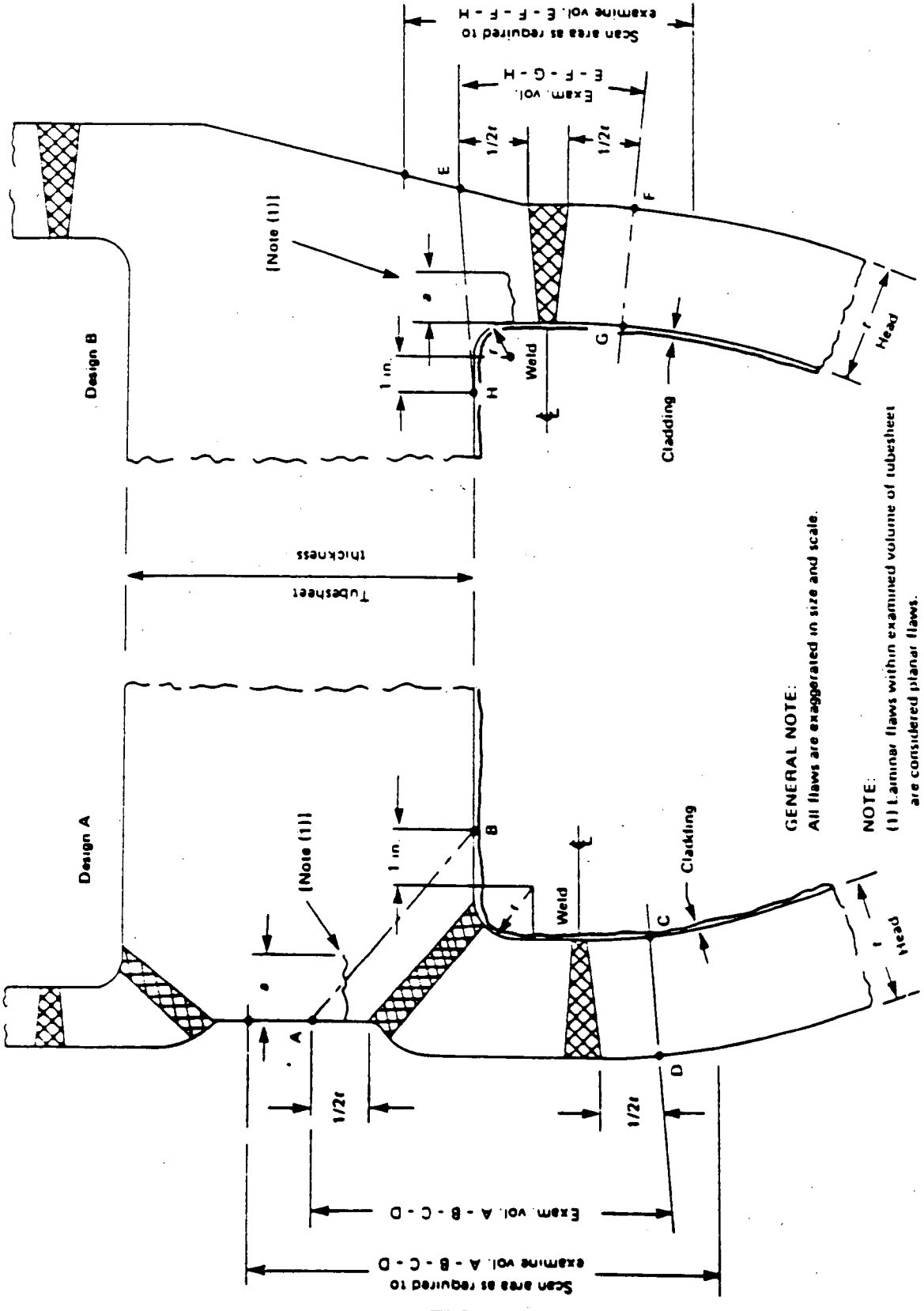
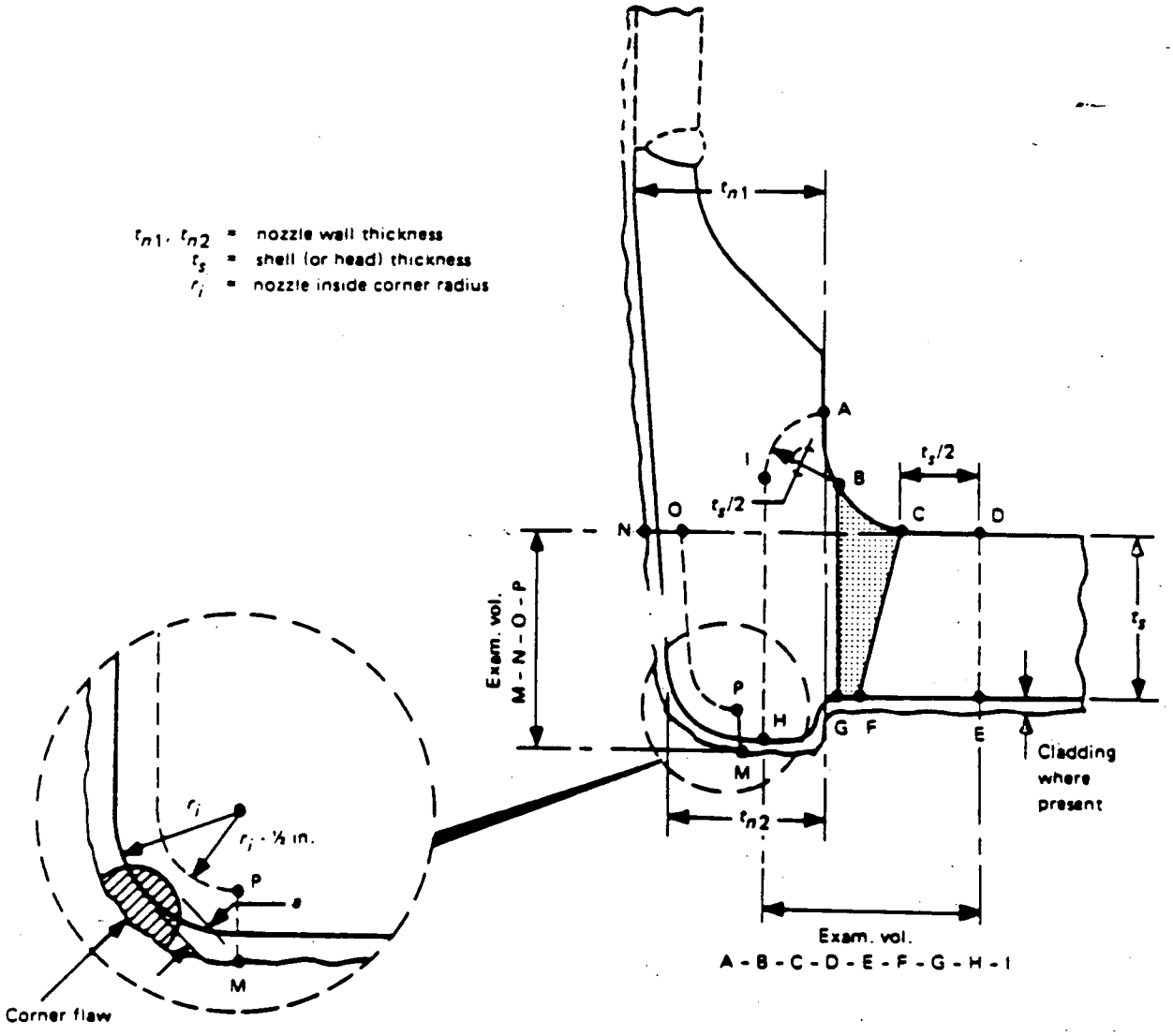


FIG. IWB-2500-6 TYPICAL TUBESHEET-TO-HEAD WELD JOINTS

FIGURE 6



EXAMINATION REGION (Note (1))	EXAMINATION VOLUME (Note (2))
Shell (or head) adjoining region	C-D-E-F
Attachment weld region	B-C-F-G
Nozzle cylinder region	A-B-G-H-I
Nozzle inside corner region	M-N-O-P

NOTES:

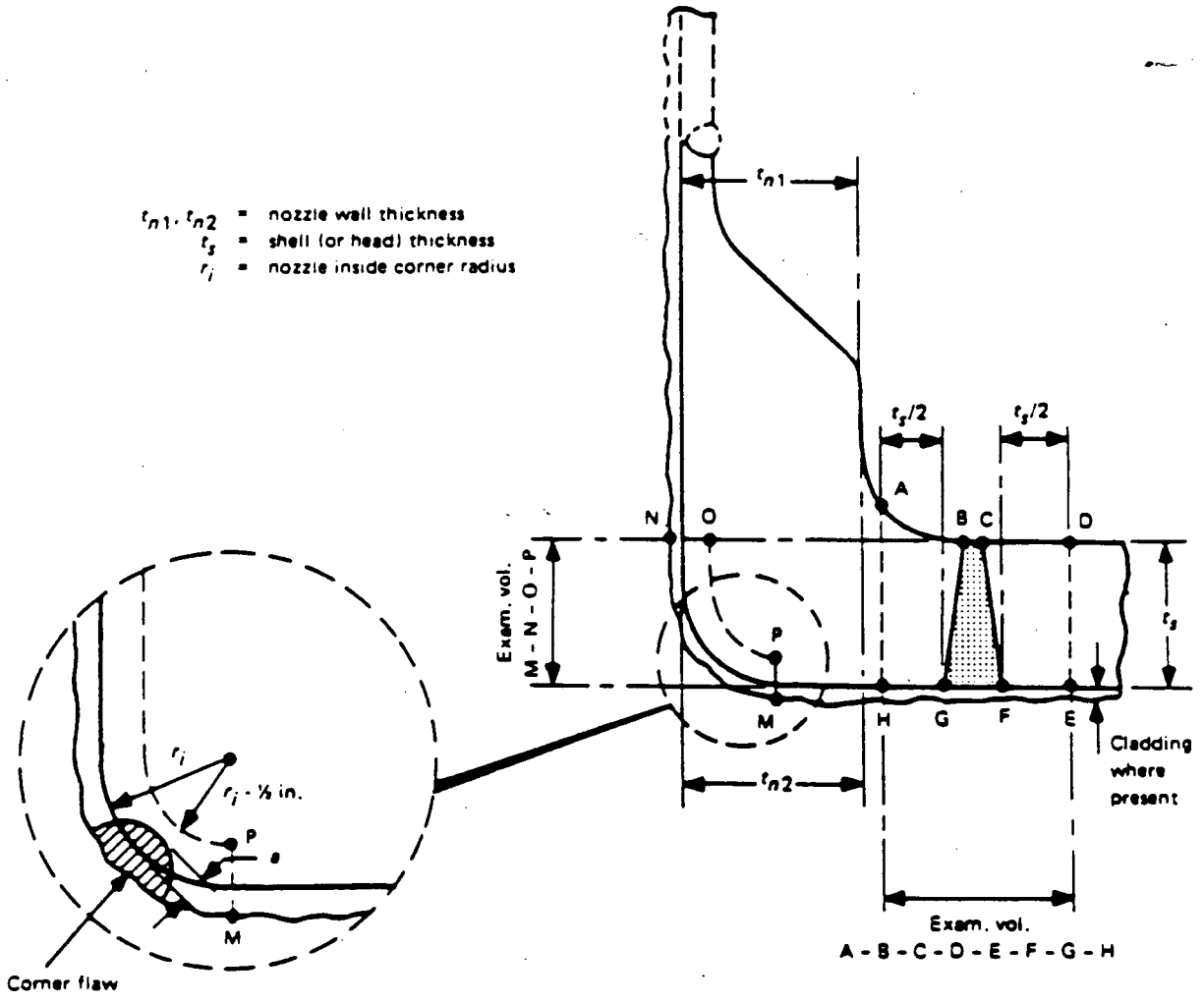
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.

(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIGURE 7

NOZZLE IN SHELL OR HEAD

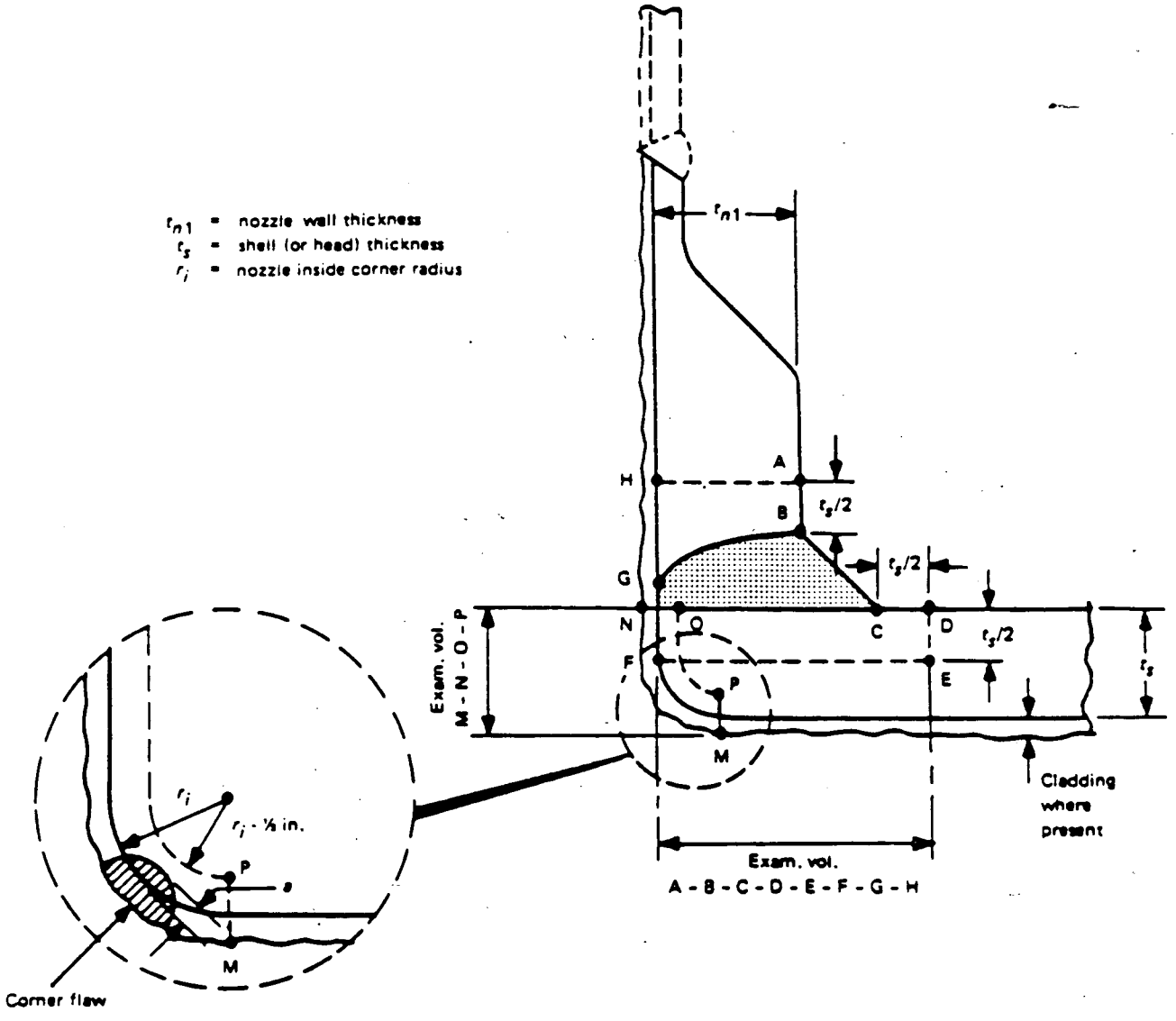
(Examination Zones in Barrel Type Nozzles Joined by Full Penetration Corner Welds)



EXAMINATION REGION (Note (1))	EXAMINATION VOLUME (Note (2))
Shell (or head) adjoining region	C-D-E-F
Attachment weld region	B-C-F-G
Nozzle cylinder region	A-B-G-H
Nozzle inside corner region	M-N-O-P

NOTES:
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIGURE 8
NOZZLE IN SHELL OR HEAD
(Examination Zones in Flange Type Nozzles Joined by Full Penetration Butt Welds)



EXAMINATION REGION (Note (1))	EXAMINATION VOLUME (Note (2))
Shell (or head) adjoining region	C-D-E-F-G
Attachment weld region	B-C-G
Nozzle cylinder region	A-B-G-H
Nozzle inside corner region	M-N-O-P

NOTES:

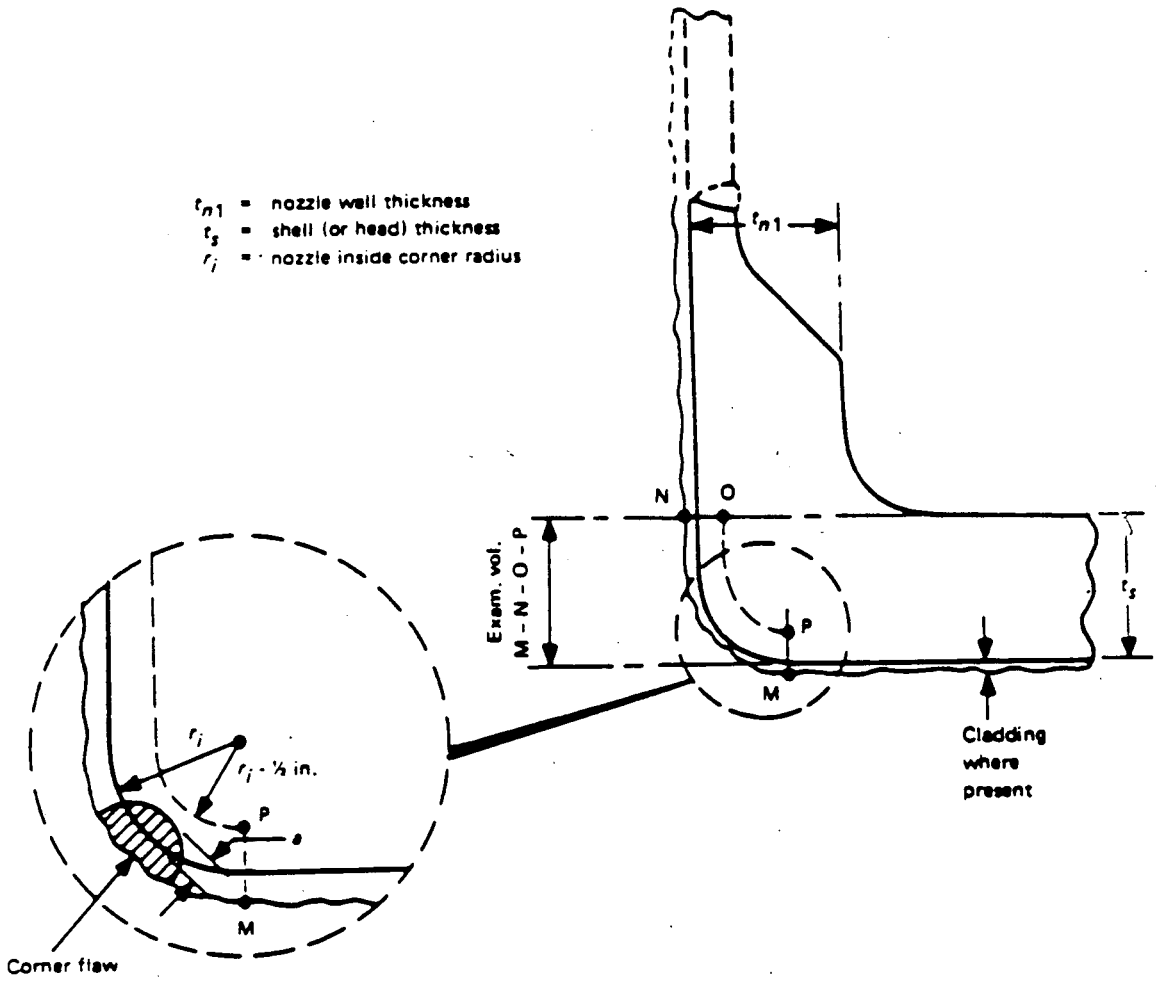
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.

(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIGURE 9

NOZZLE IN SHELL OR HEAD

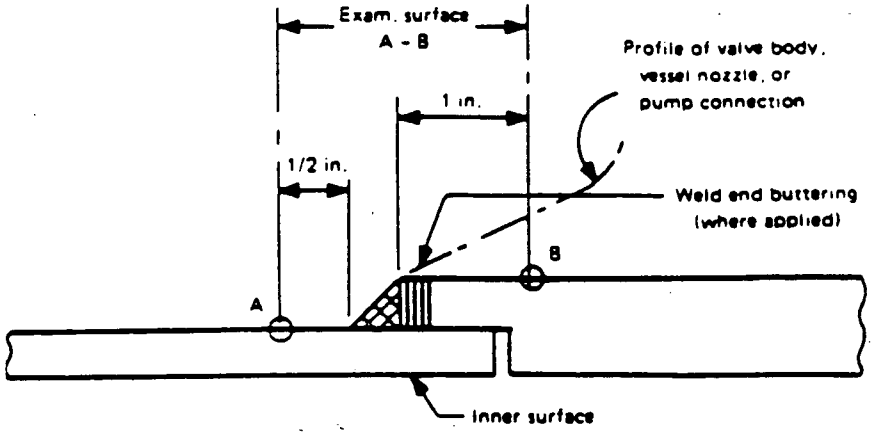
(Examination Zones in Set–On Type Nozzles Joined by Full Penetration Corner Welds)



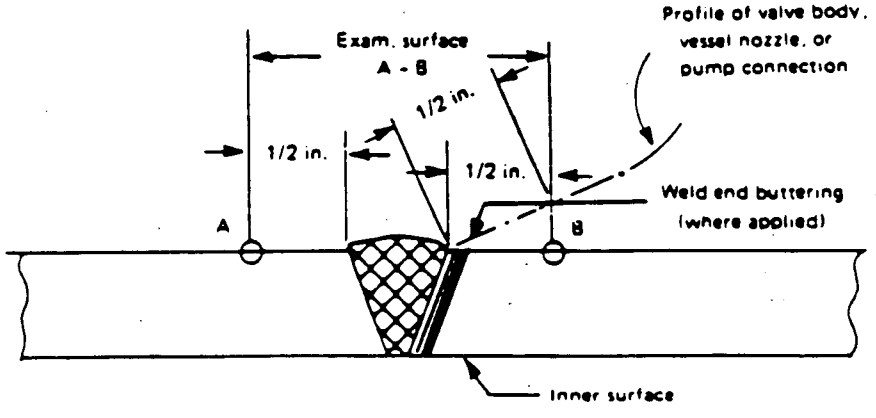
EXAMINATION REGION [Note (1)]	EXAMINATION VOLUME [Note (2)]
Nozzle inside corner region	M-N-O-P

NOTES:
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIGURE 10
NOZZLE IN SHELL OR HEAD
(Examination Zone in Nozzles Integrally Cast or Formed in Shell or Head)



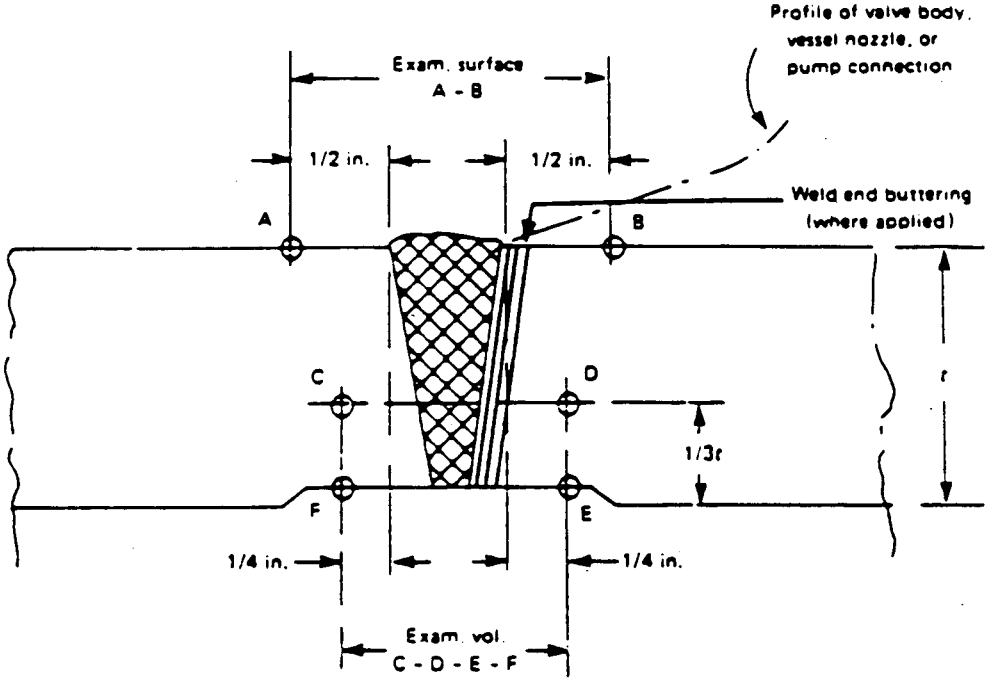
(a) Socket Welded Piping



(b) Less Than NPS 4

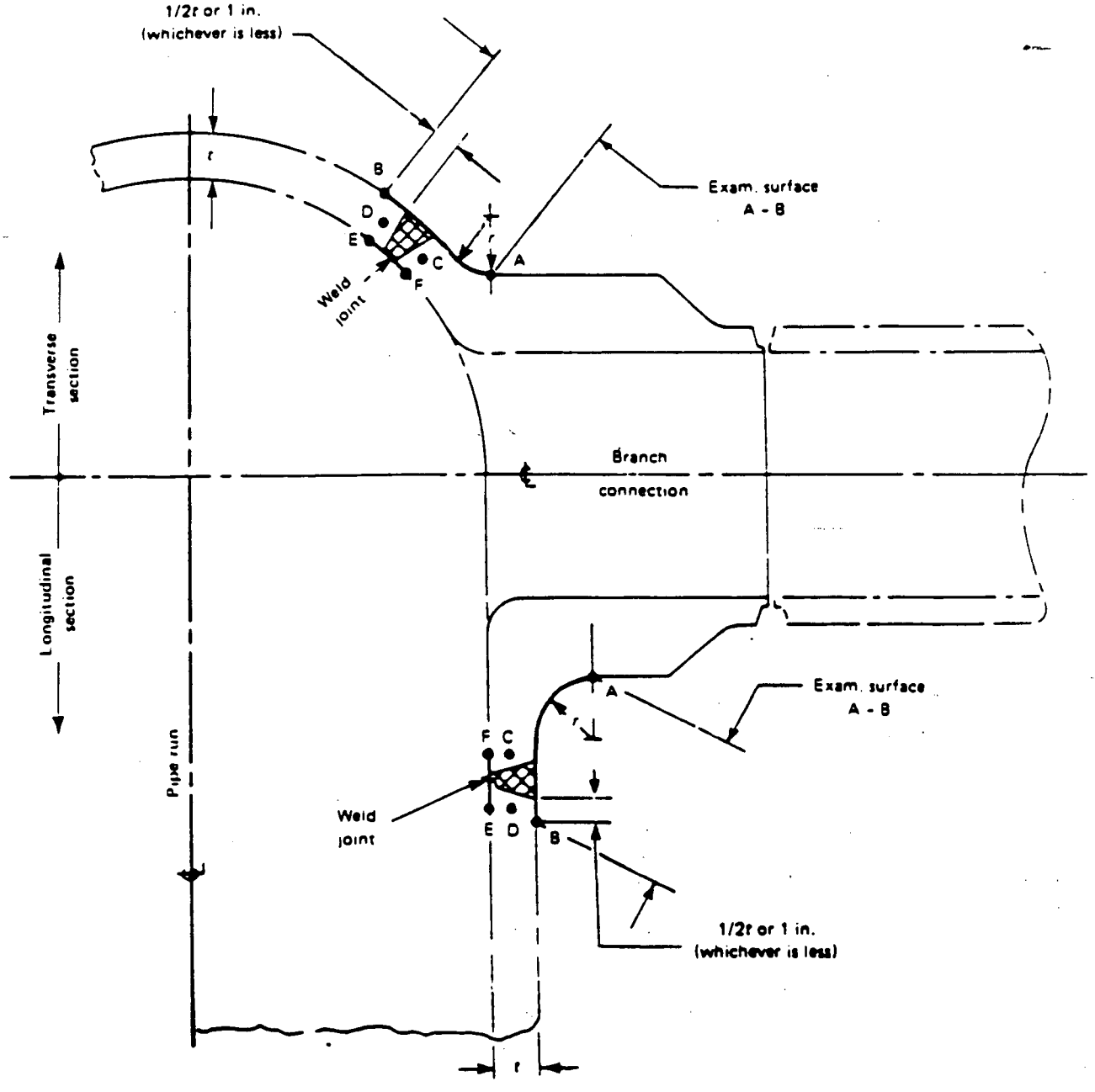
FIGURE 11

SIMILAR AND DISSIMILAR METAL WELDS IN COMPONENTS AND PIPING



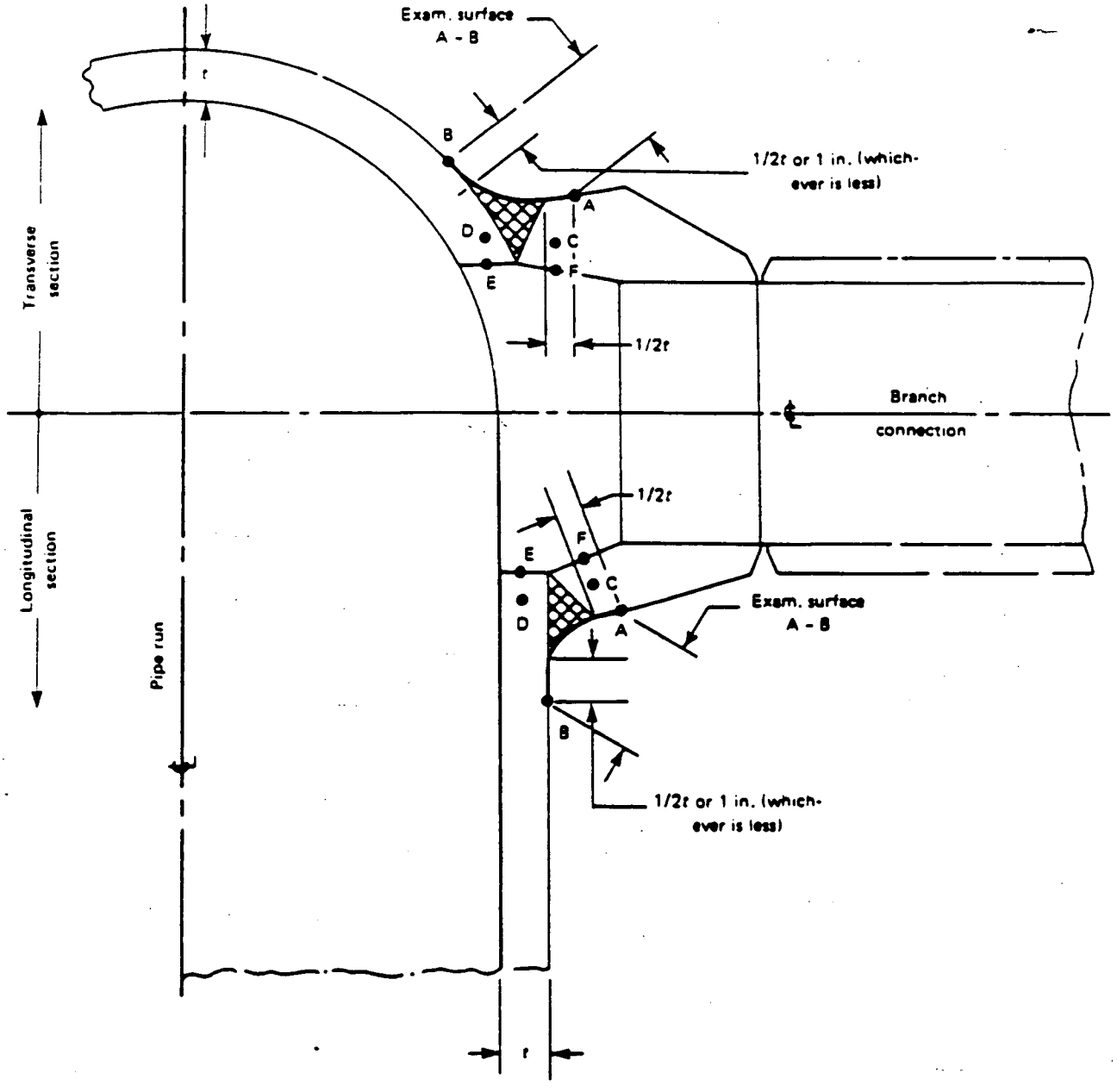
(c) NPS 4 or Larger

FIGURE 12
SIMILAR AND DISSIMILAR METAL WELDS IN COMPONENTS AND PIPING
(continued)



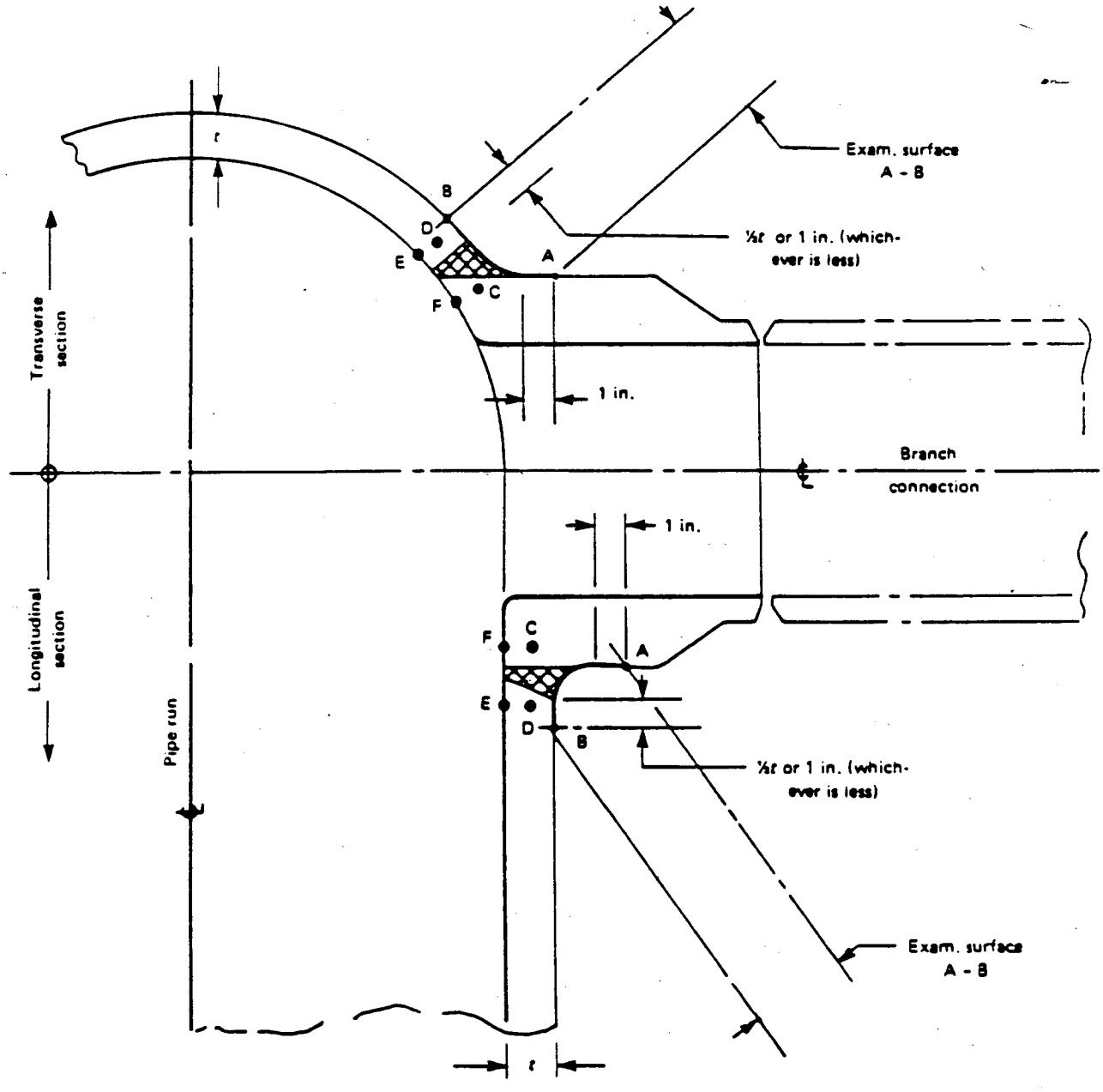
GENERAL NOTE:
Examination volumes C - D - E - F are defined per Fig. 12

FIGURE 13
PIPE BRANCH CONNECTION



NOTE: Examination volumes C - D - E - F are defined per Fig. 12

FIGURE 14
PIPE BRANCH CONNECTION



GENERAL NOTE: Examination volumes C - D - E - F are defined per Fig. 12

FIGURE 15
PIPE BRANCH CONNECTION

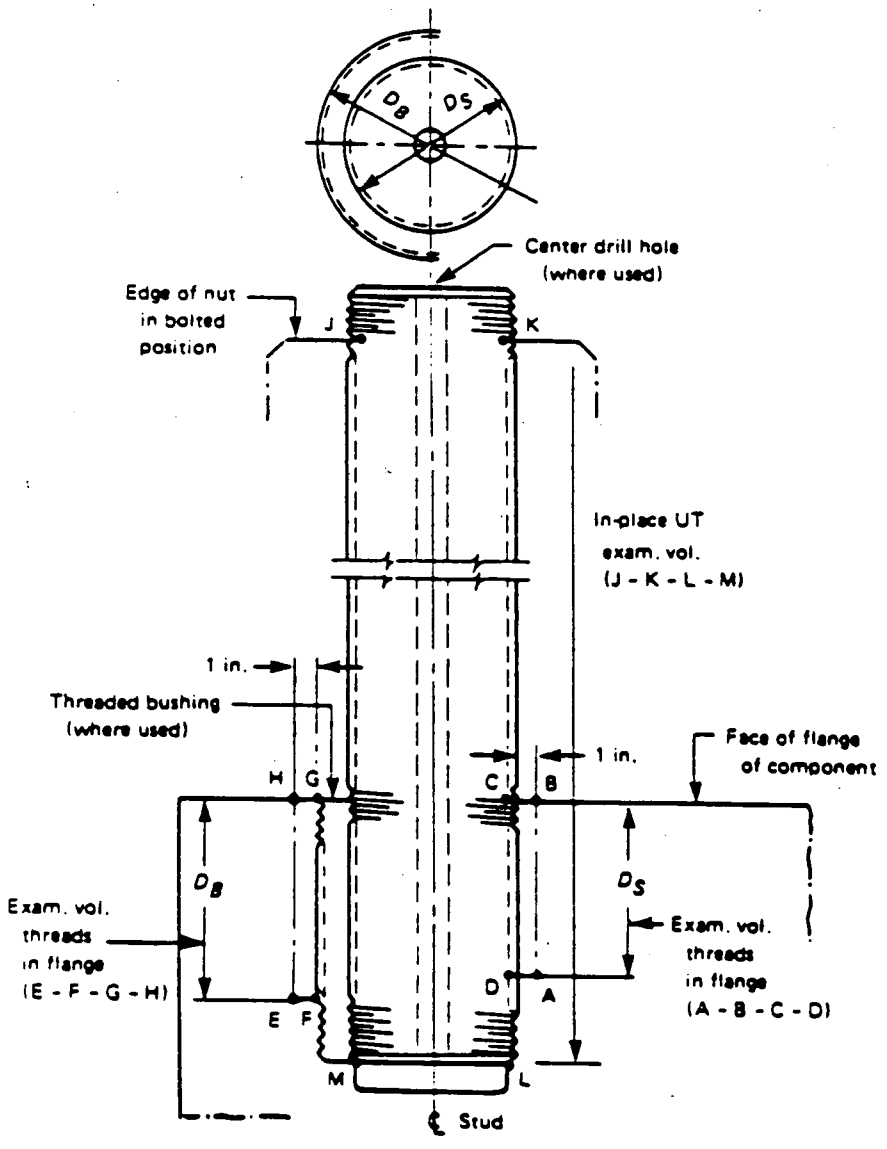


FIGURE 16
CLOSURE STUD AND THREADS IN FLANGE STUD HOLE

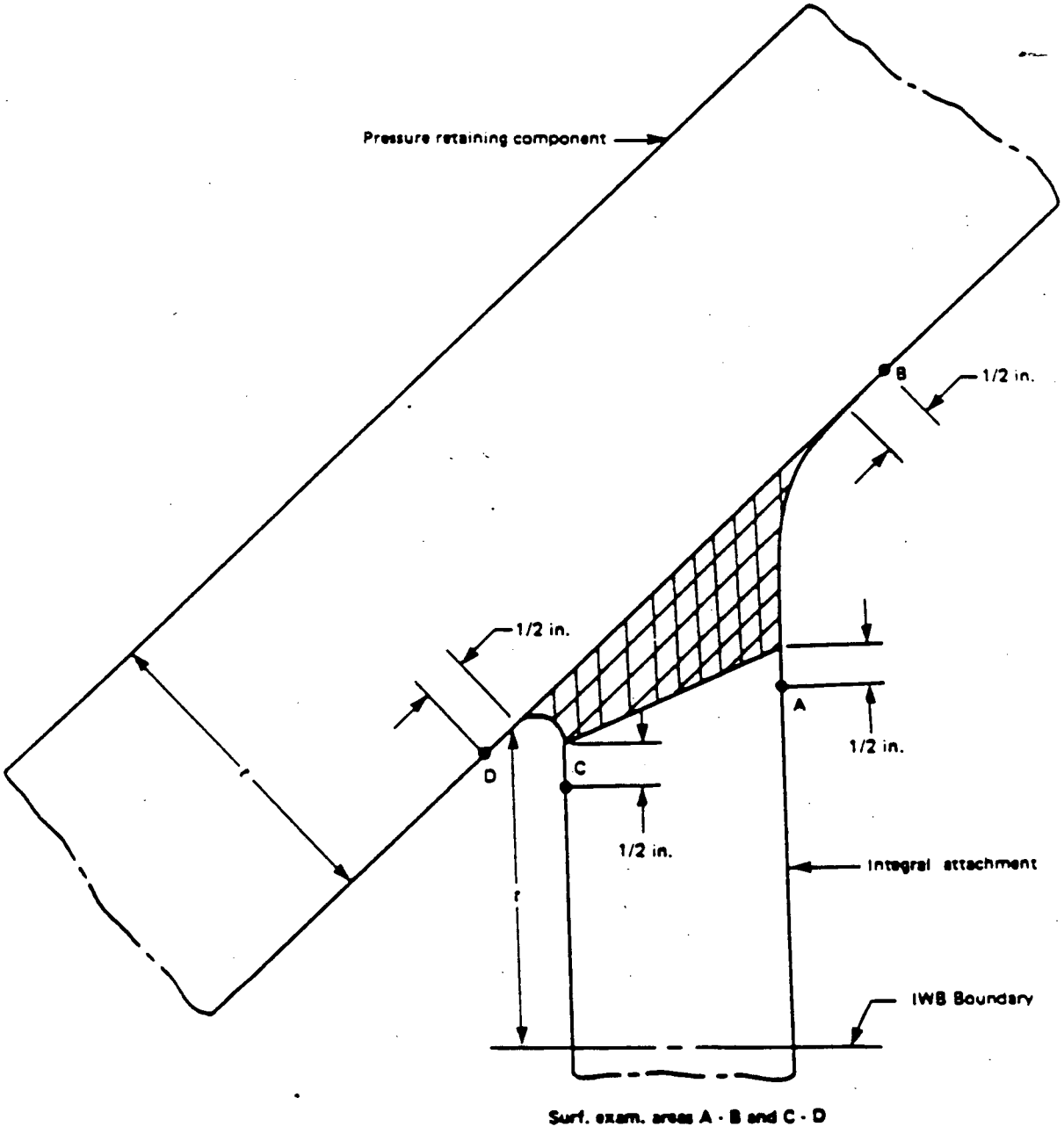


FIGURE 17
INTEGRAL ATTACHMENT WELD

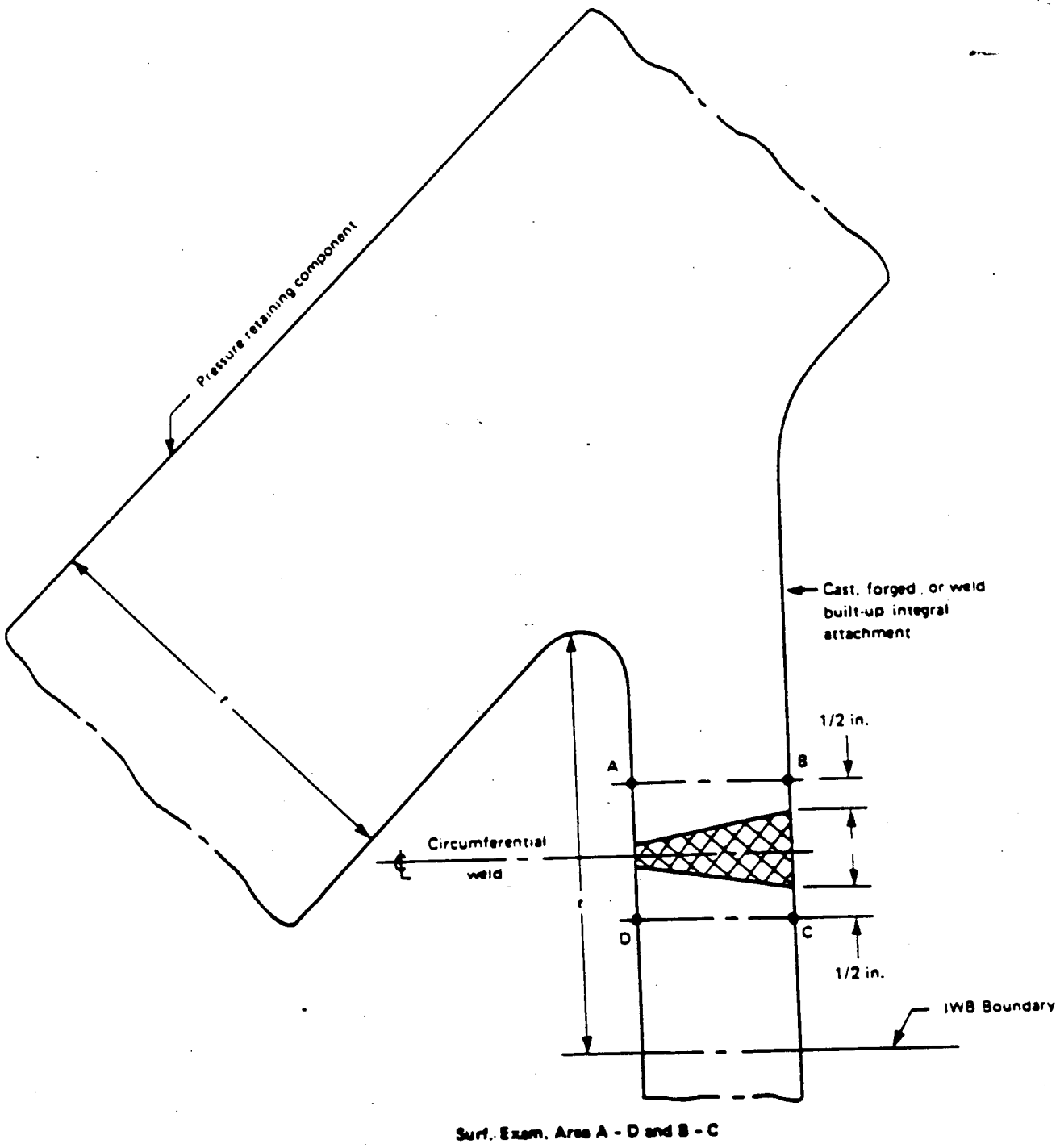


FIGURE 18
SUPPORT CIRCUMFERENTIAL WELD JOINT

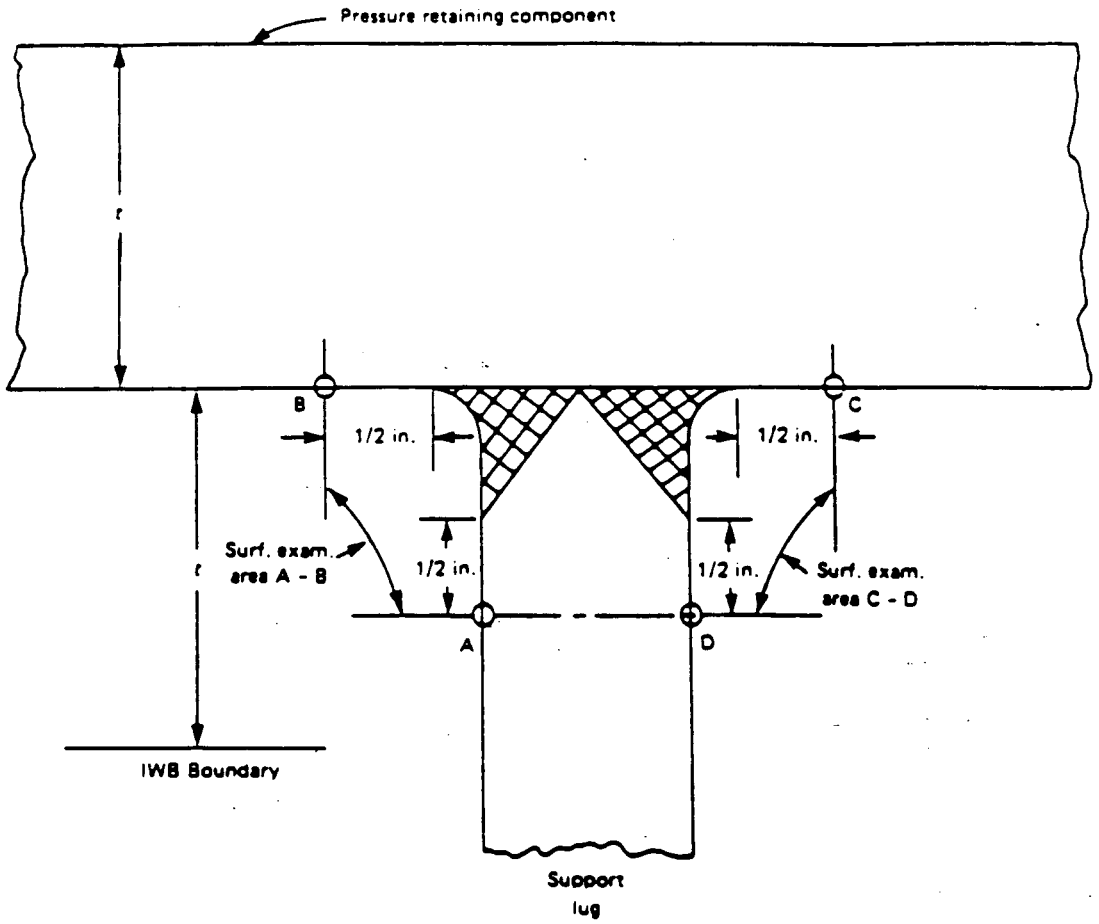


FIGURE 19
INTEGRAL ATTACHMENT

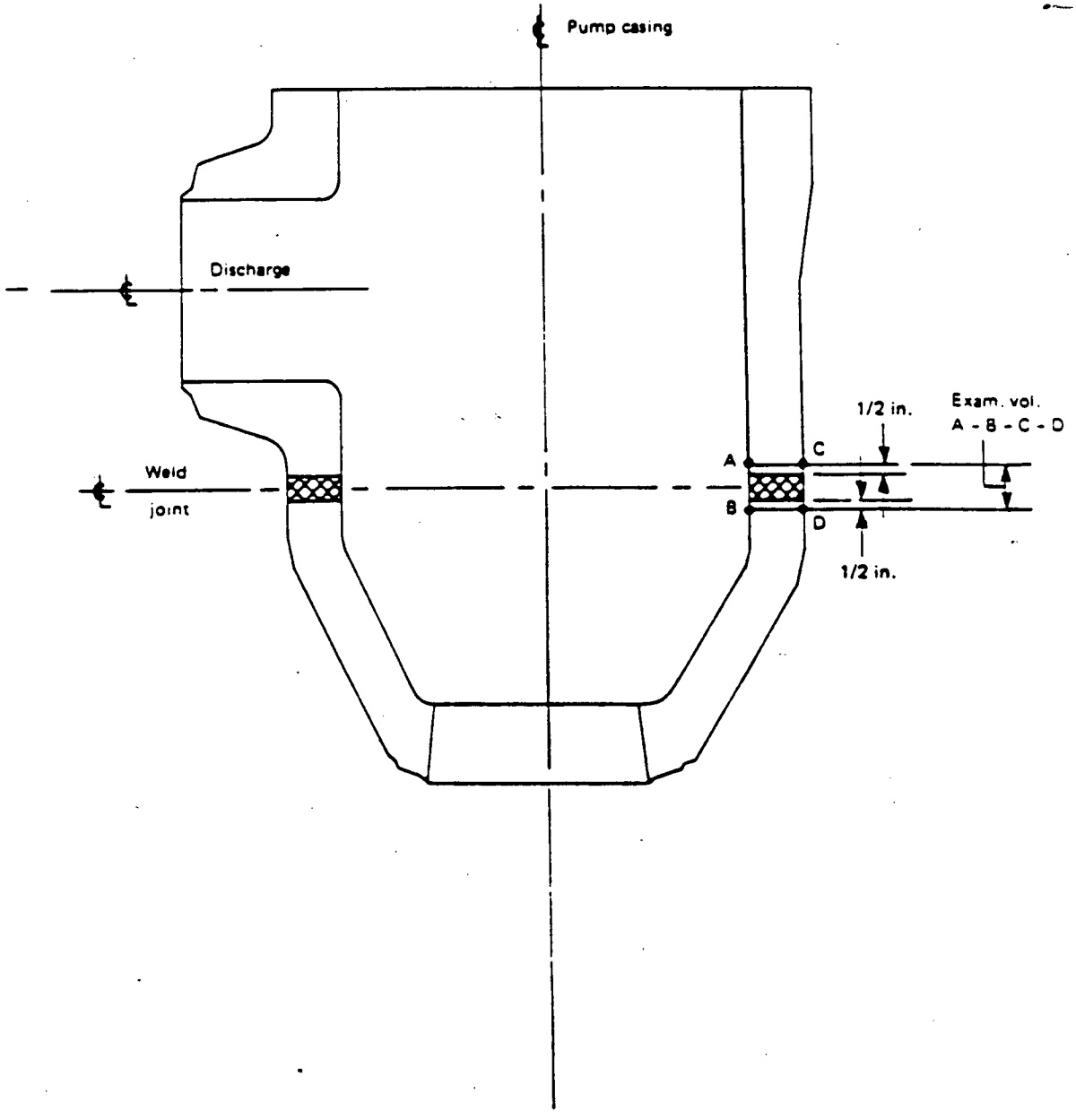


FIGURE 20
PUMP CASING WELD
[Type F Pump (Section III)]

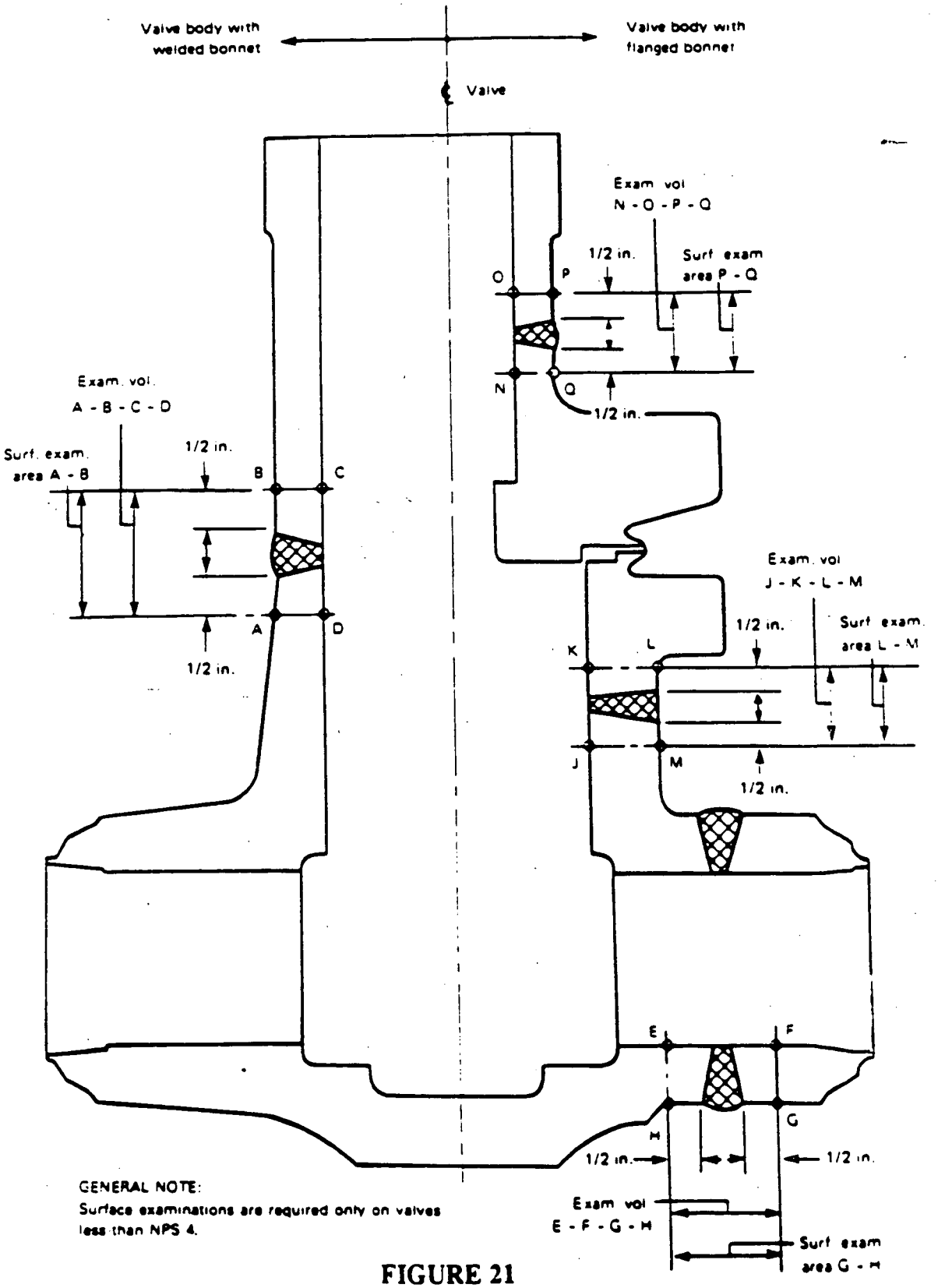
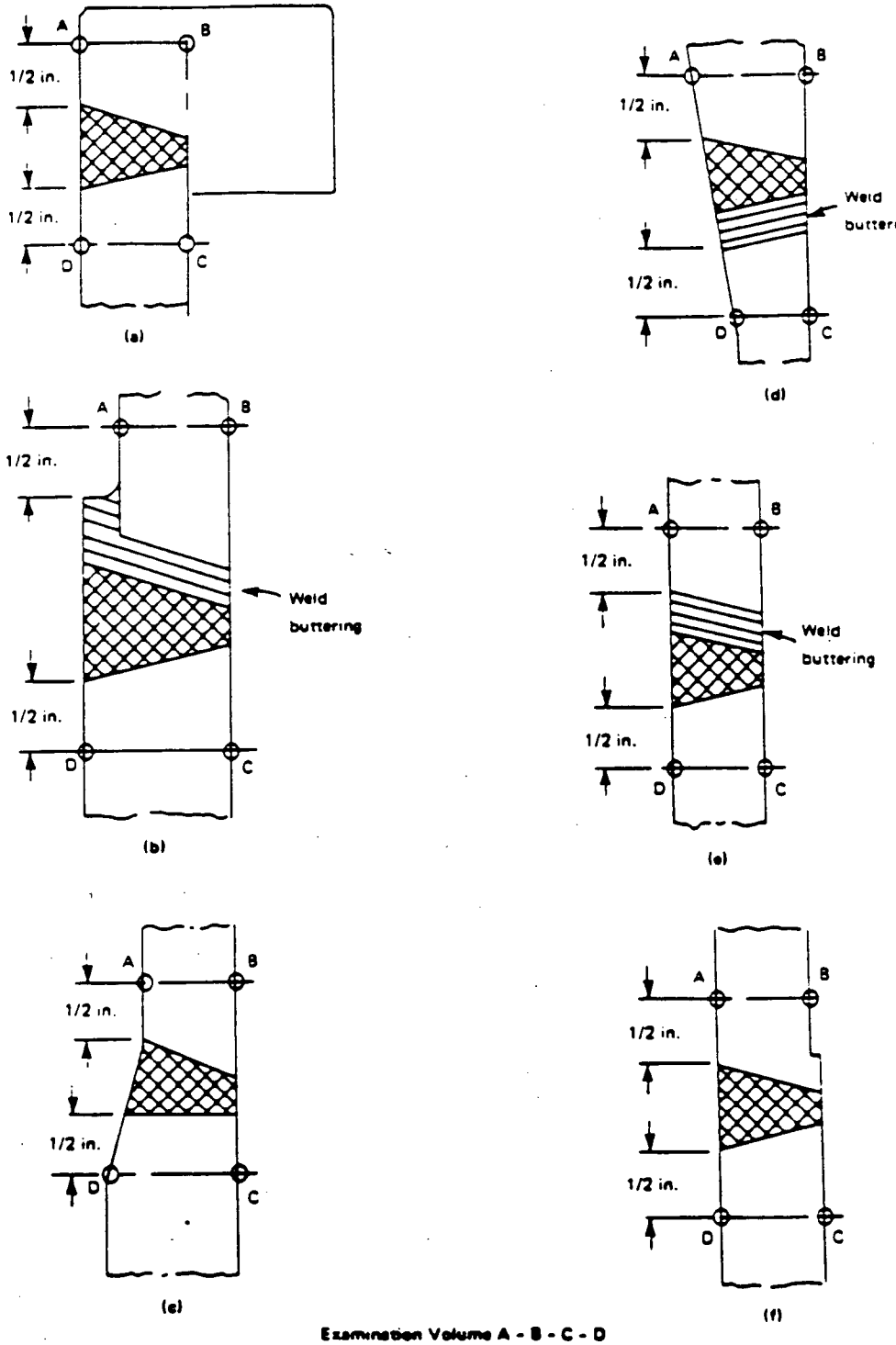


FIGURE 21
VALVE BODY WELDS



Examination Volume A - B - C - D
Surface Examination Area A - D

FIGURE 22
CONTROL ROD DRIVE HOUSING WELDS

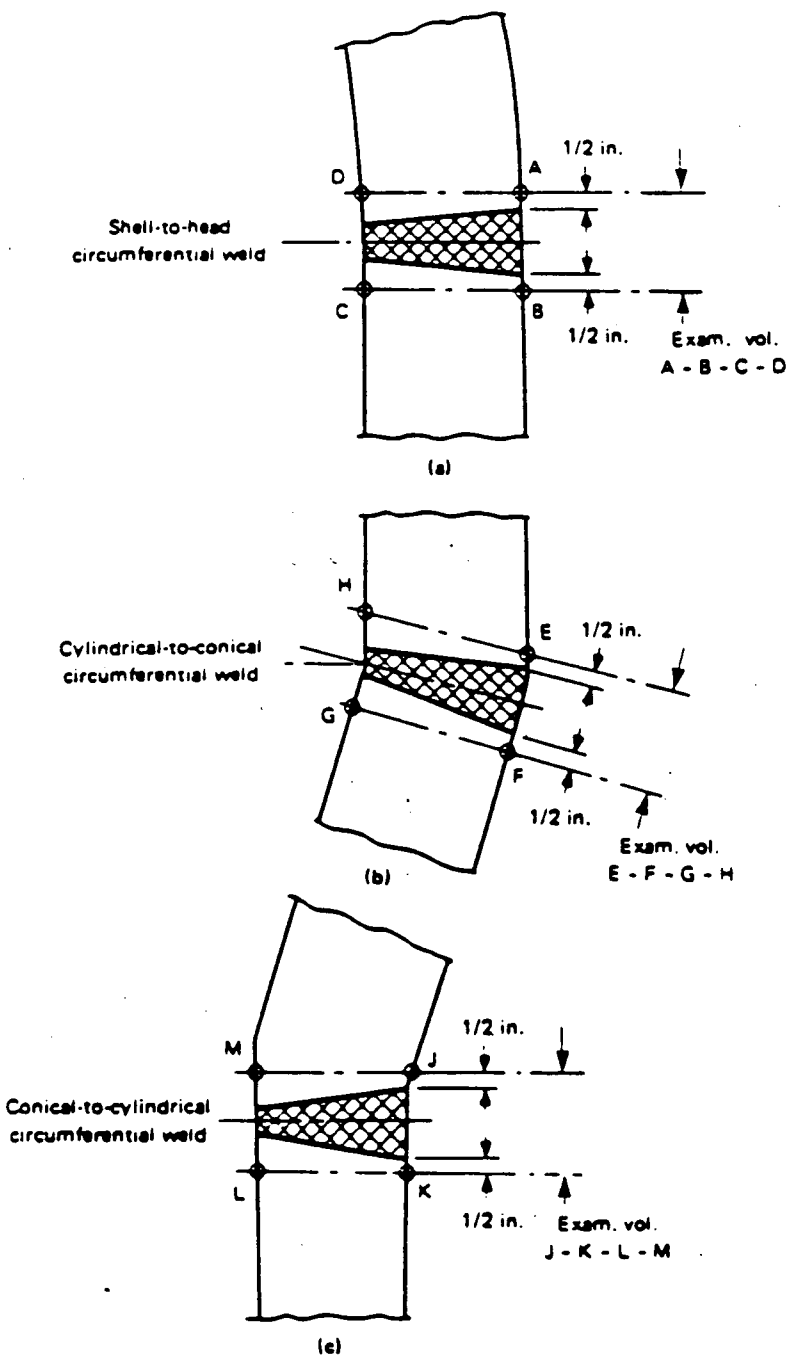


FIGURE 23
VESSEL CIRCUMFERENTIAL WELDS

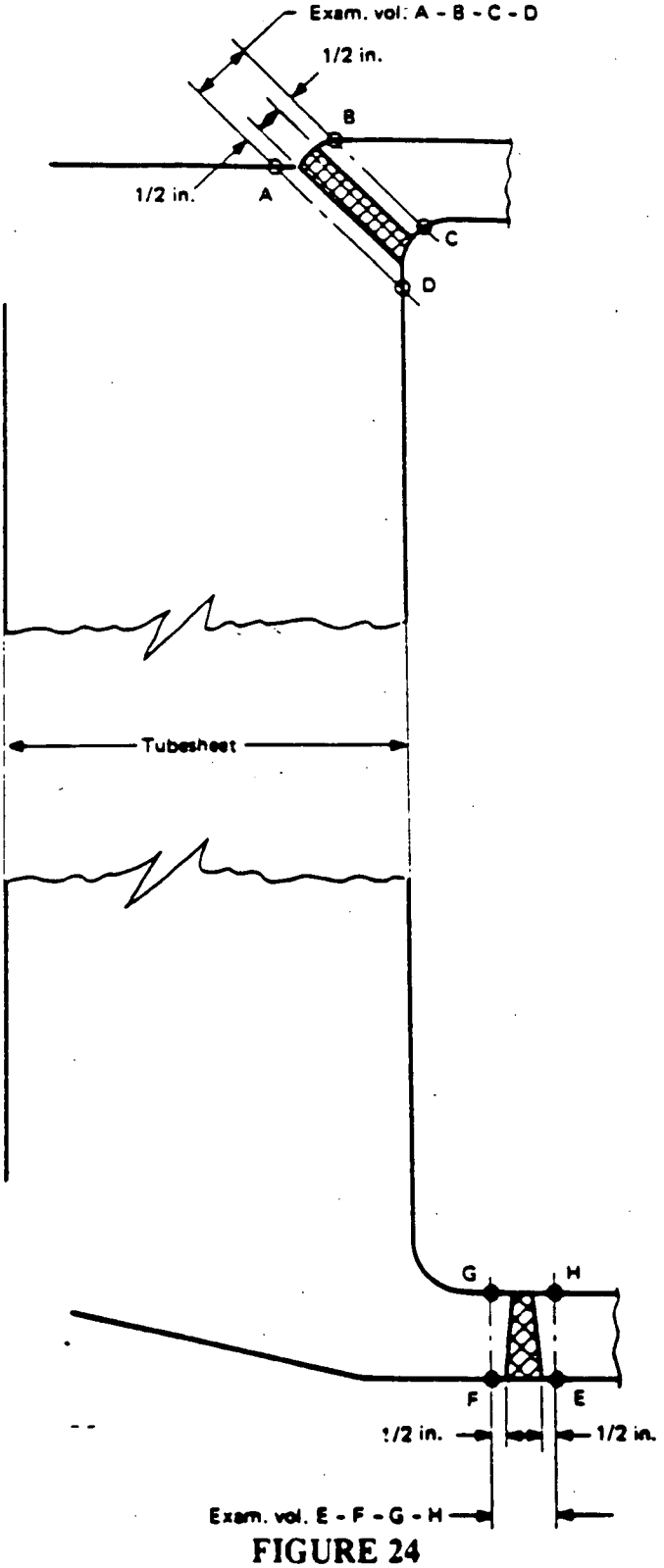
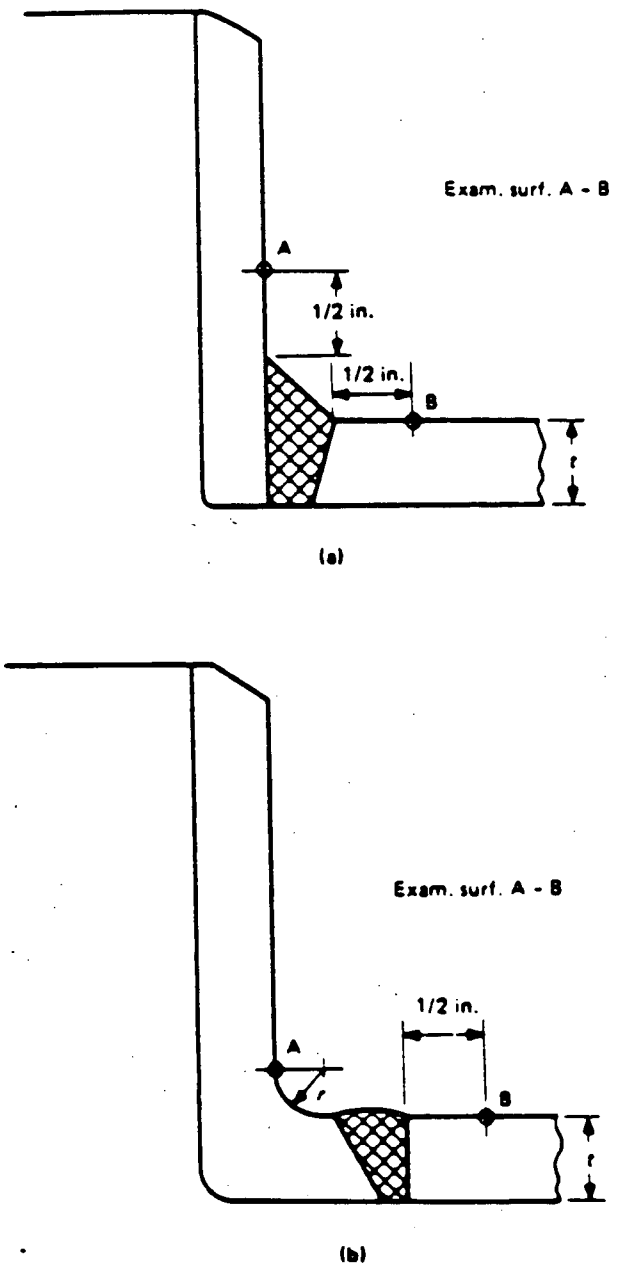


FIGURE 24

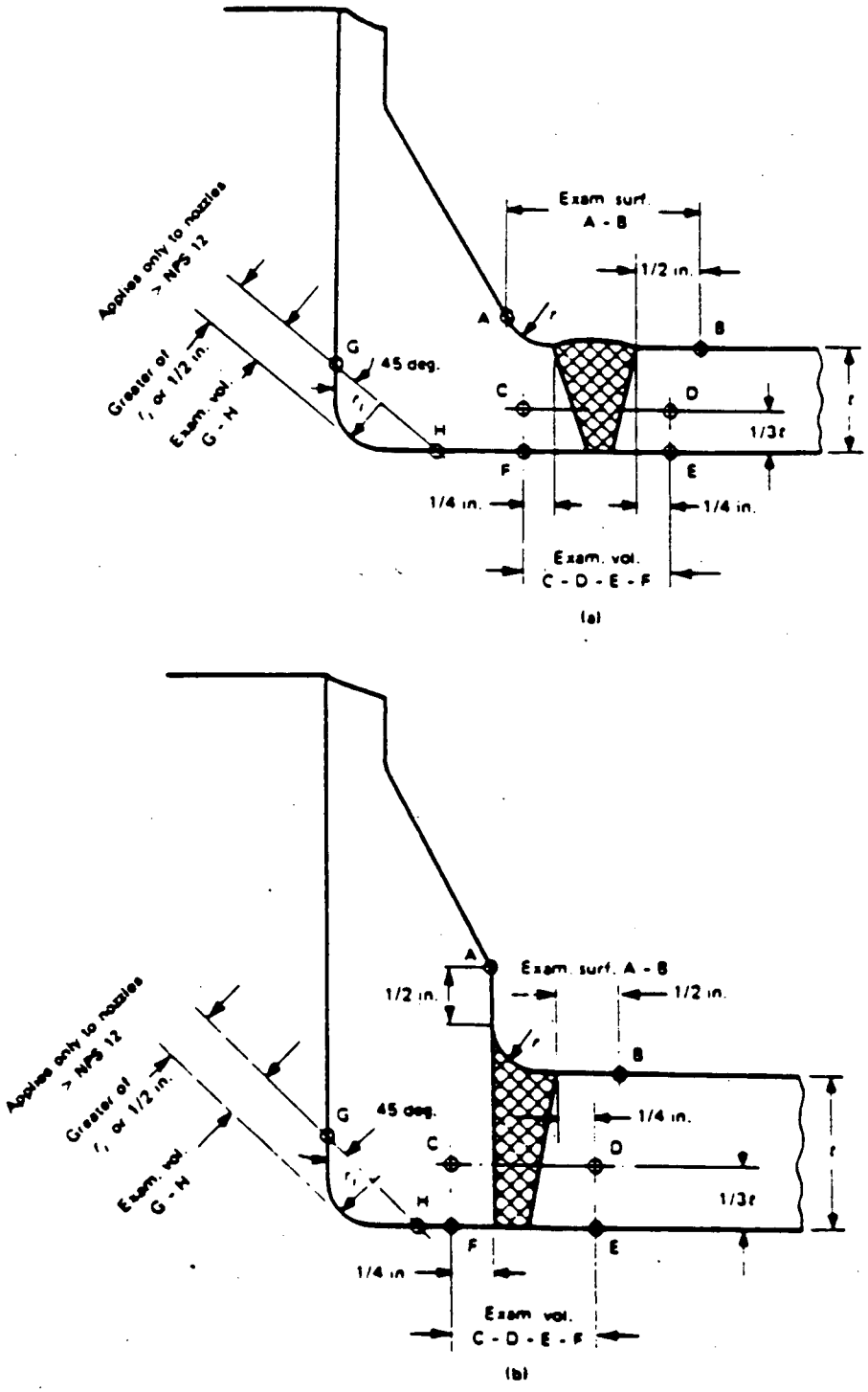
TYPICAL TUBESHEET-TO-SHELL CIRCUMFERENTIAL WELDS

(Steam Generator Designs)



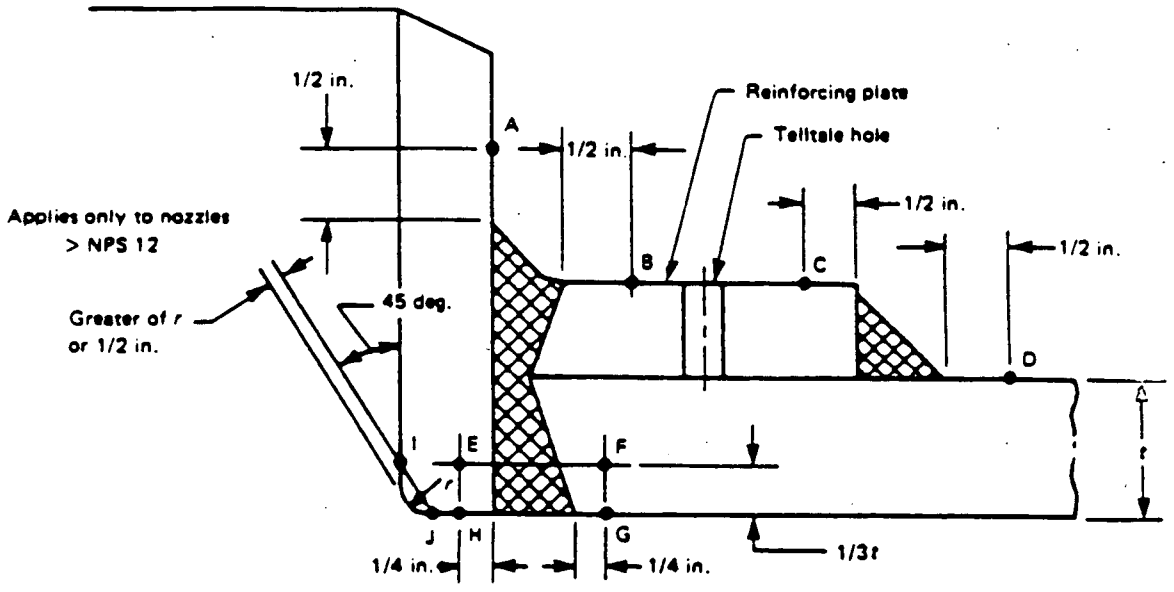
GENERAL NOTE:
Nozzle sizes over NPS 4; vessel thickness $t \leq 1/2$ in.

FIGURE 25
NOZZLE-TO-VESSEL WELDS



GENERAL NOTE Nozzle sizes over NPS 4; vessel thickness over 1/2 in.

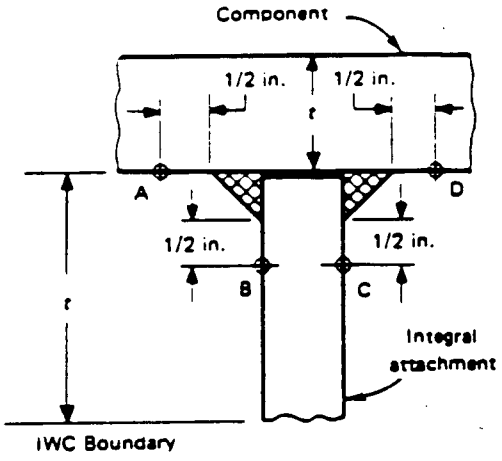
FIGURE 26
NOZZLE-TO-VESSEL WELDS



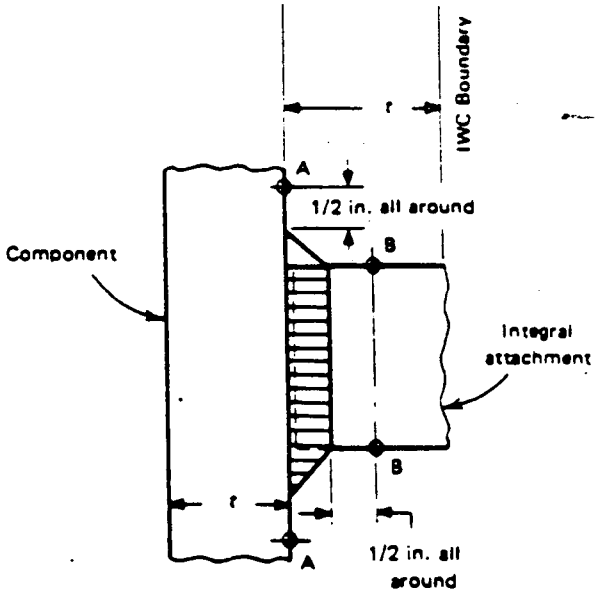
Exam. surf. A - B and C - D
Exam. vol. E - F - G - H and I - J

(c)

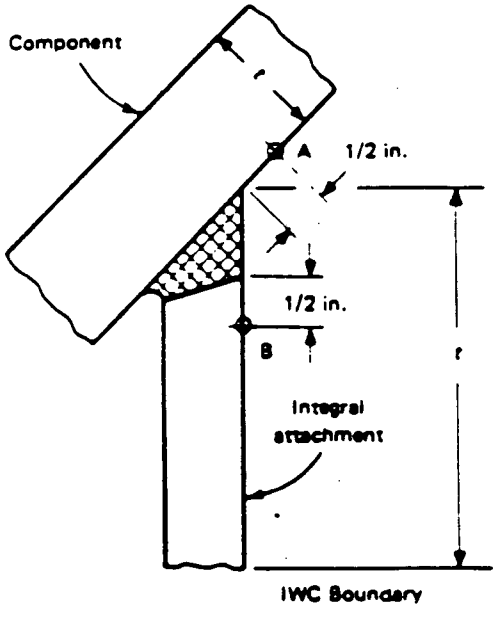
FIGURE 27
NOZZLE-TO-VESSEL WELDS
(Continued)



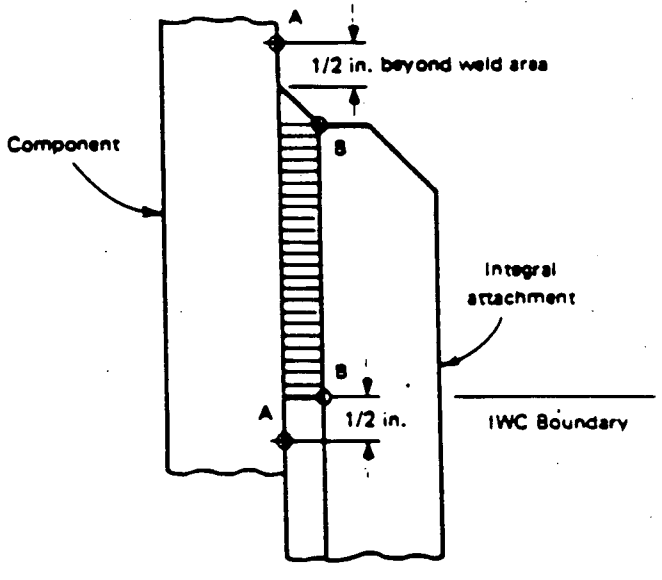
(a) Examination Surfaces A - B and C - D



(b) Examination Surfaces A - B



(c) Examination Surfaces A - B



(d) Examination Surfaces A - B

FIGURE 28
INTEGRALLY WELDED ATTACHMENTS

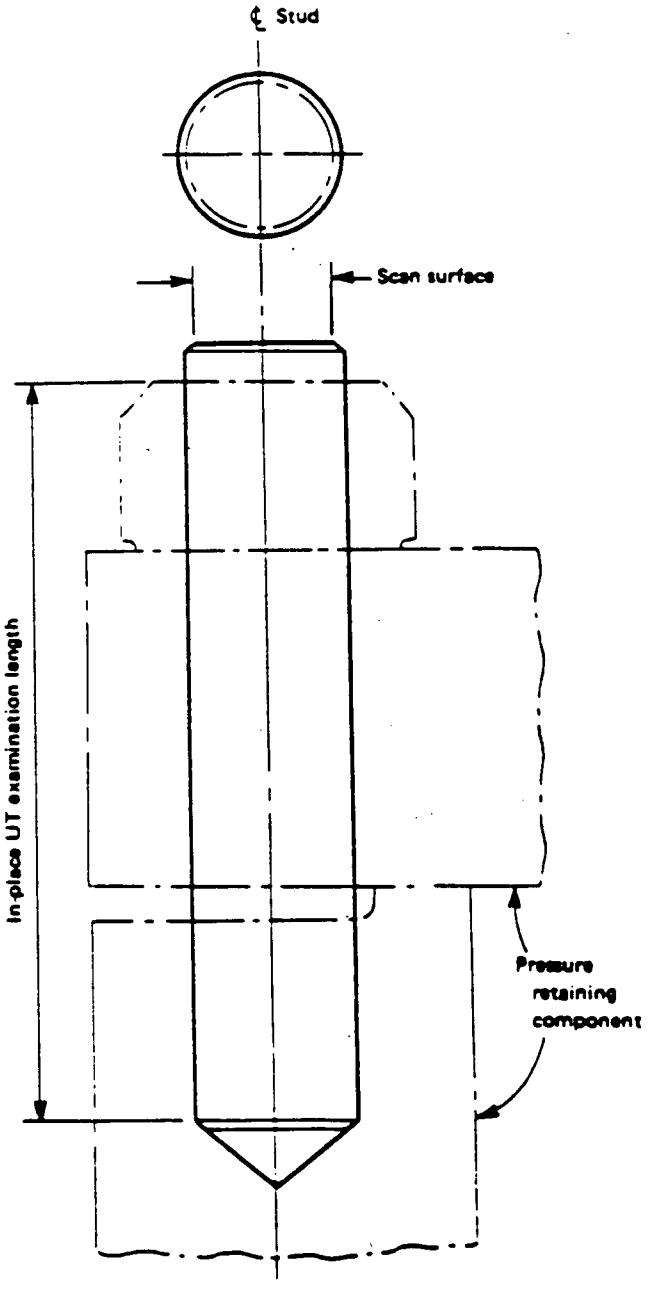
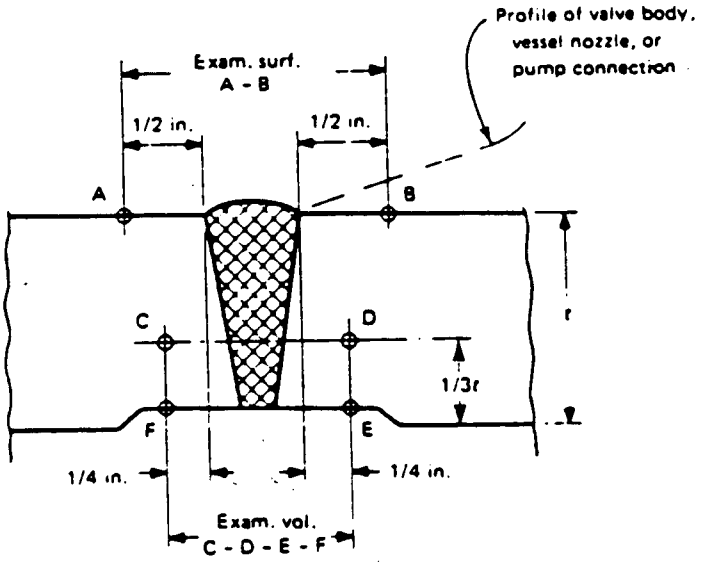
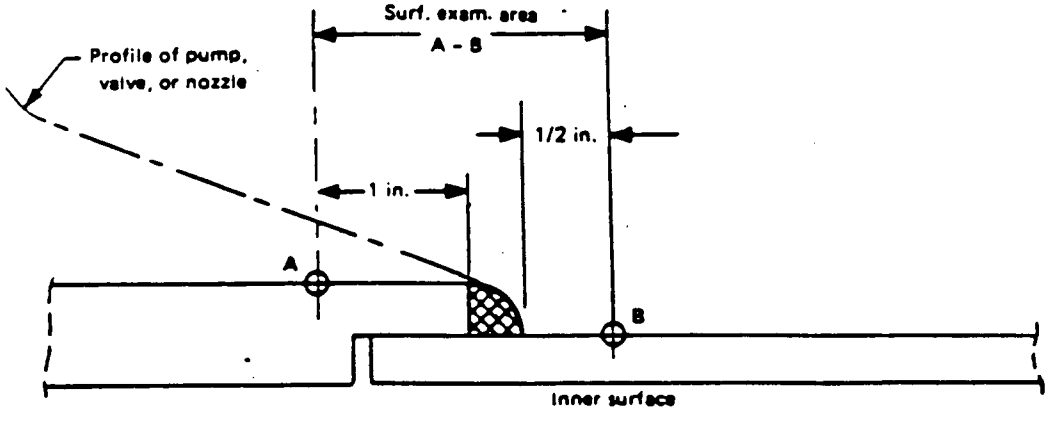


FIGURE 29
PRESSURE RETAINING BOLTING



(a) Full Penetration Weld



(b) Socket Welded Piping

FIGURE 30
WELDS IN PIPING

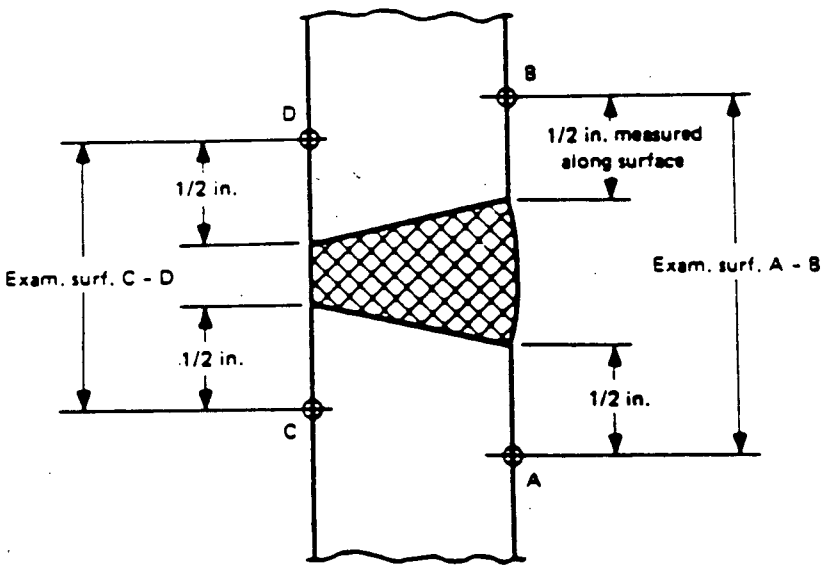


FIGURE 31
WELDS IN PUMP CASING AND VALVE BODIES

Examination Surface A - B Around Branch Connection

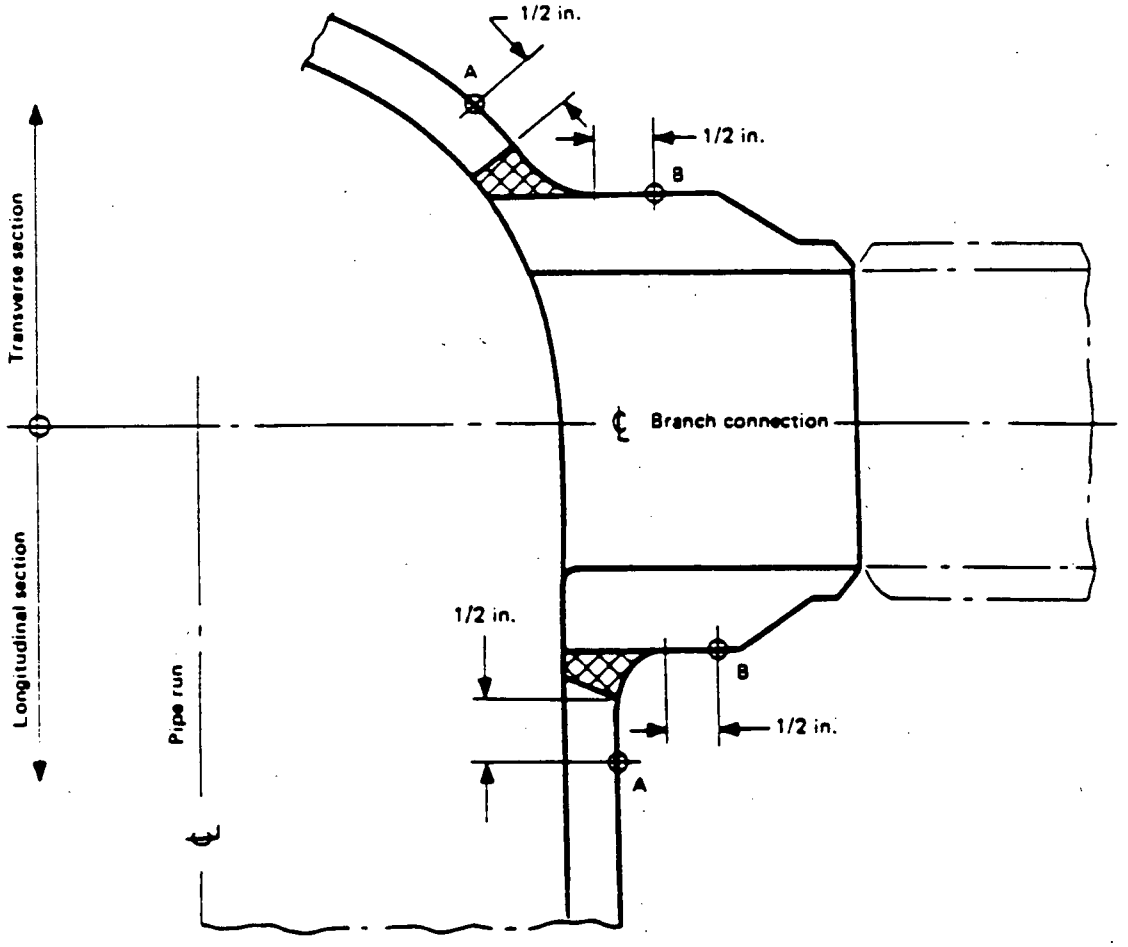


FIGURE 32
BRANCH CONNECTION WELDS

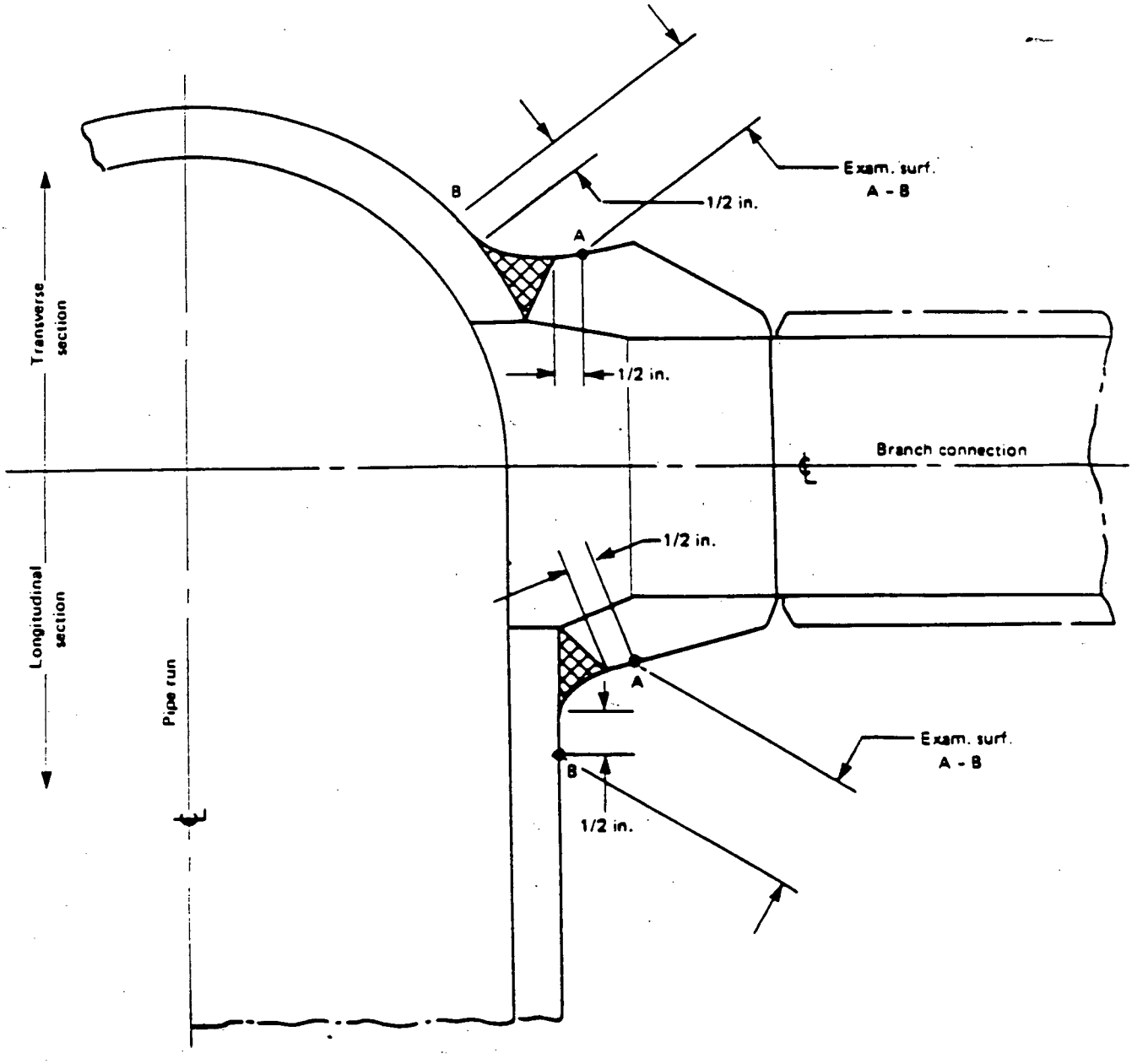


FIGURE 33
PIPE BRANCH CONNECTION

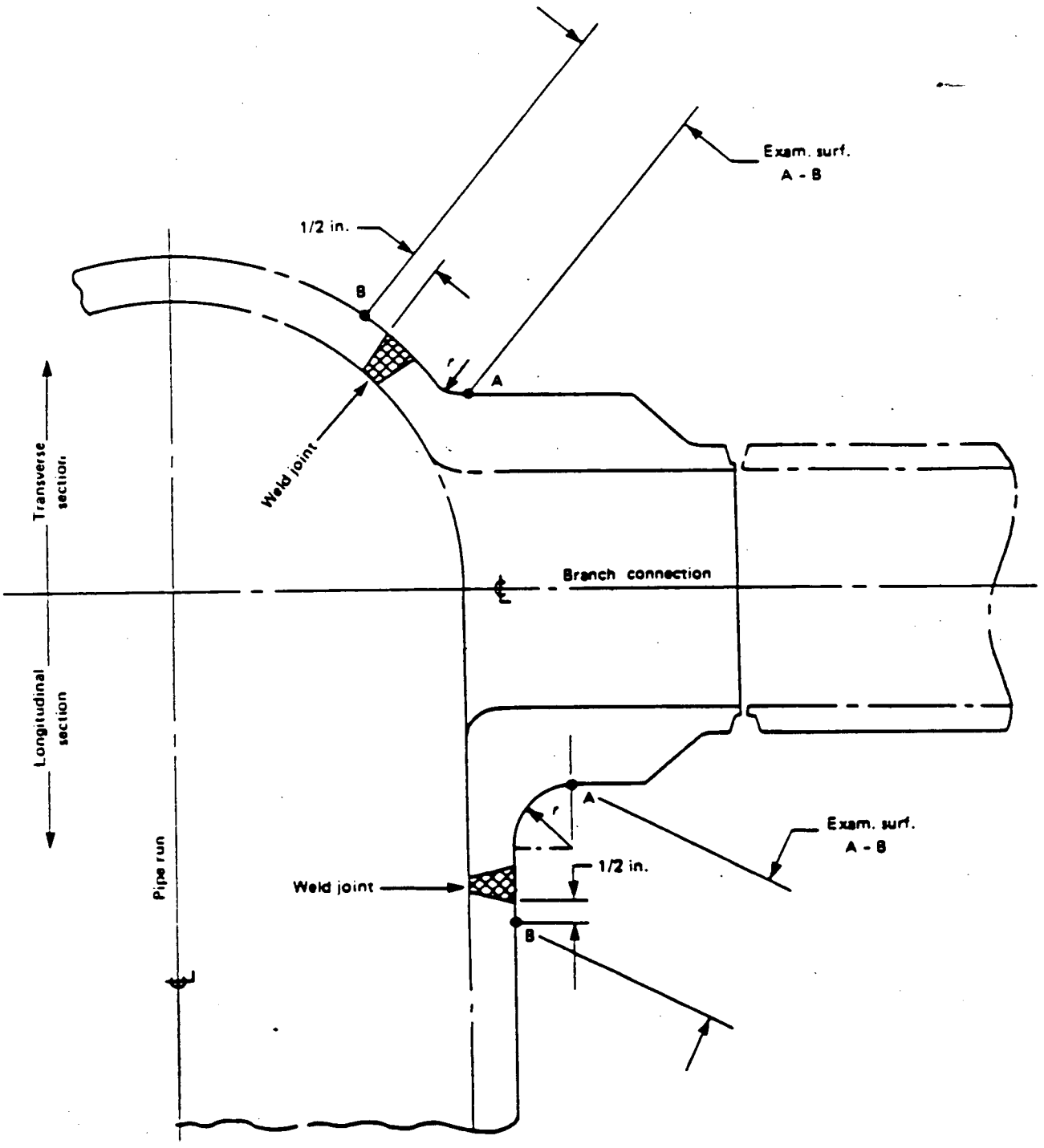


FIGURE 34
PIPE BRANCH CONNECTION

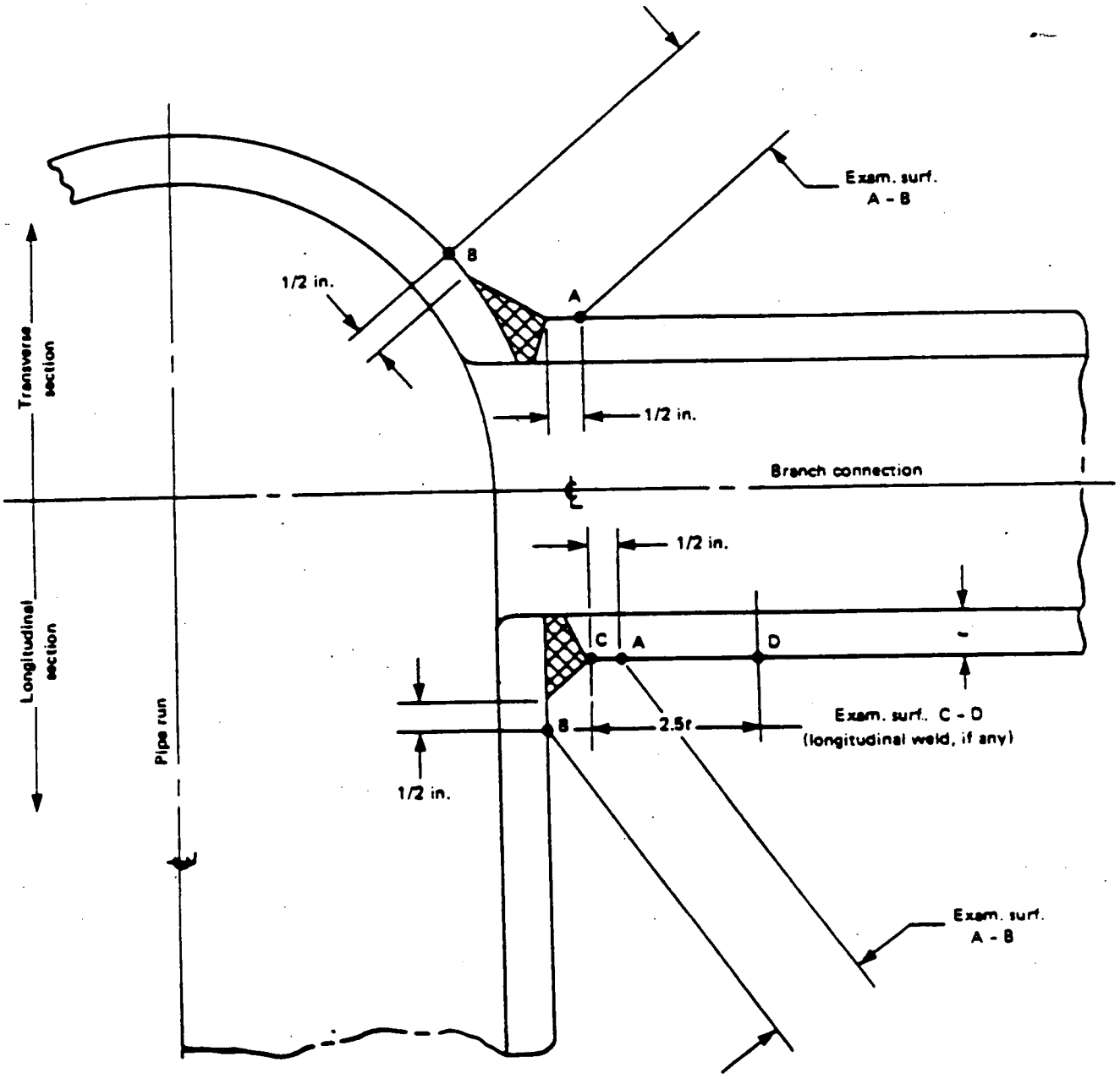


FIGURE 35
PIPE BRANCH CONNECTION

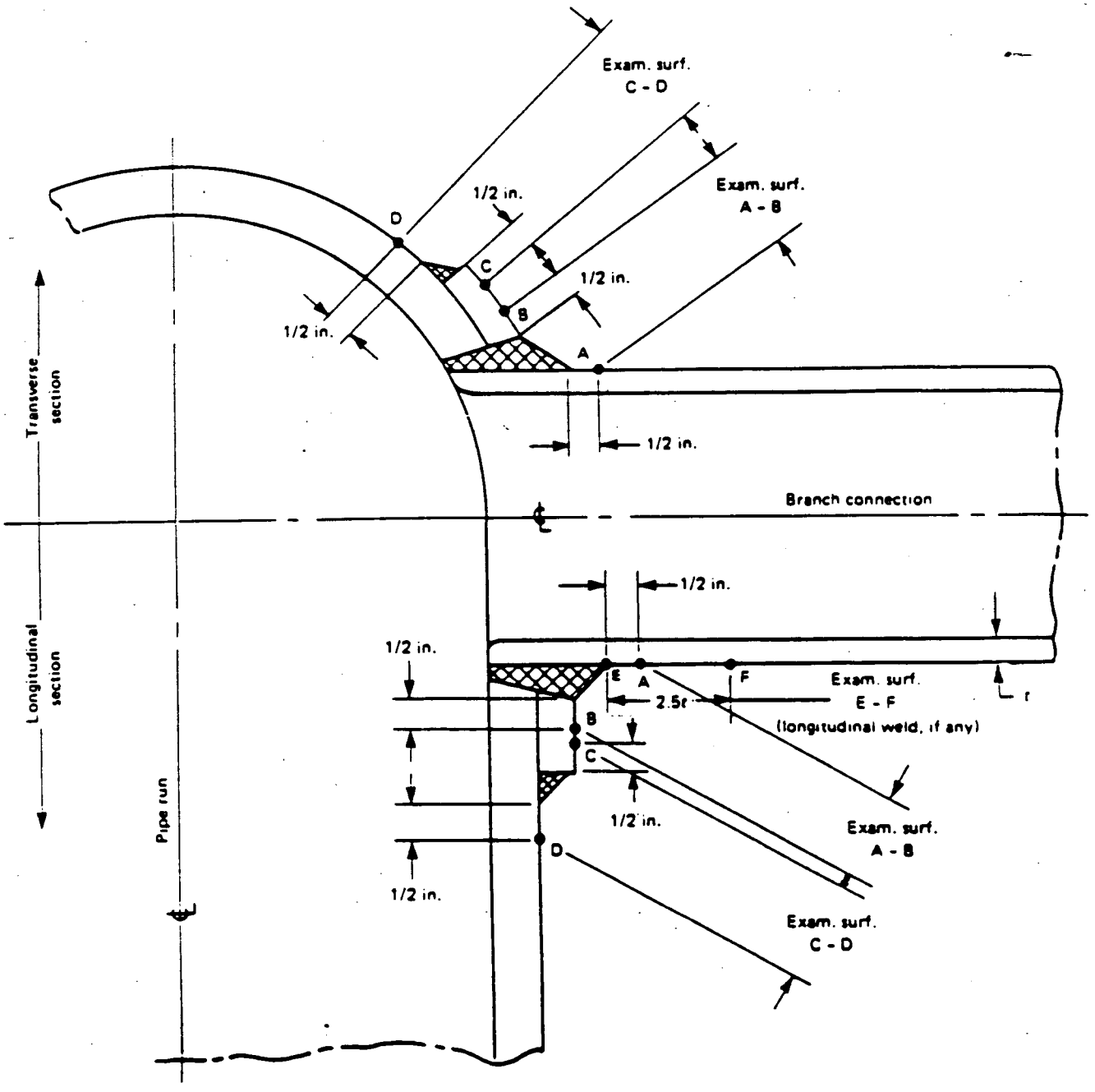


FIGURE 36
PIPE BRANCH CONNECTION

11.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

FOR INFORMATION ONLY

SPECIAL PROCEDURE

SP-1221

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE EXAMINATION PERSONNEL

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/17/93

Expiration Date 2/16/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 15 JUL 93
Manager - Technical Support — Date

CONTROLLED RECIPIENT ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 39	0

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE EXAMINATION PERSONNEL

CONTROLLED COPY

oject Application Implementing	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. - SIGNATURE - DATE

REV NO.	PREPARED BY	Level III	President	QA Manager	
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	12-07-92	12-07-92	12-07-92	12-07-92	
11					

REVISION LOG

REV. NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	8/19/83	All	Complete rewrite CRA 3601	8/22/13
2	4/25/85	1	New style cover sheet.	4/25/85
			Document effective date "4/20/85".	
		3	Added "Fig. 1...24".	
			Added "Fig. 2...25".	
			Appendices assigned page numbers.	
		4	Section 1 "For work...revision".	
			Reworded to "After the effective...	
			Section XI".	
		8	Para. 5.2.A(1) added "with Level III	
			approval". Para. 5.2.A(2) revised.	
		9	Para. 5.2.C "Appendix B" changed to	
			"Figure 2".	
		11	Para. 5.4 revised to include Appendices A	
			through D.	
		24	Figure 1 added.	
		25	Figure 2 added.	
			Refer to CRA#5277.	
3	9/9/86	ALL	General Revision See CRA 6230	9/9/86
4	3/18/87	ALL	Correct typos, change NES Division to	3/19/87
			NES, Inc.	
		1,2	Change title	
		20 24	Change interrupted service to 1 year	
		26, 28	Delete 2 hours blacklight training	
		29	Delete 3 hours add'l MT training	
		32	Reword B.2 for noting cert restrictions	
		33	C.1 include specific exam	
			Refer to CRA 6445	

REV. NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
5	12/14/87	ALL	General Revision See CRA 6677	Steve Andrews 12/14/87
6	2/16/88	21	9.2.B.4 change 8 hr refresher trng	Steve Andrews 2/16/88
		24	last sentence : " . . .unless the	
			individual was working . . ."	
7	3/16/90	5	Para. 1.0 retitled; Para. 2.1 added UT/T Method	Kenneth R Brise 3/21/90
			Para. 2.2 Referenced NUC-MR-1A	
		10	5.2.B (4) Deleted "by one...professionals."	
			5.2.C Reworded	
		11	5.3.A.1 Deleted "or more" methods: second sentence	
			5.3.C.1 Deleted "engineering or science" college: first sentence	
		17	7.3.B.1 Added "These questions are" starting second sentence	
			7.3.D Reworded second sentence	
		18	7.3.E.1 Added second sentence	
			8.1 Reworded last sentence	
		21	9.2.A Added "This experience...the verifier" as second sentence	
		22	9.4 Reworded first sentence	
		24	10.4 Added "if there is...performance" to end of first sentence	
			10.4 Reworded second sentence	
		25	Added UT/T experience req'ts to Levels I & II	
		26	Added UT/T training req'ts to Levels I & II	
		27	Added UT/T exam req't to Level I & II	
		31	Appendix A B.4 Deleted "either...or magnetic particle"	
			B.5 Replaced "fluorescent" with "unrestricted"	
		32	A.1 Deleted fluorescent certification & Para. A.3	
		34	A.1 Added categories 2, 3 and 6; Reworded A.2	
		35	B.3 Added third paragraph	
		36	A.1.3 Added thickness category C.1 and 2 Reworded	
			Refer to CRA No. 7582 and Addendum #1	

REVISION LOG

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
8		All	General rewrite. See CRA 7708.	
9		5, 6 23–26	NUC–MR–1A imposed only by contract. VT–1 eliminated and training hours revised	
			to correspond to SNT–TC–1A & NUC–MR–1A Refer to CRA 7951	
10	12–07–92	10	Changed 6.3.1.1 from 40% to 25%	12-07-92
			Refer to CRA 8500.	

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE EXAMINATION PERSONNEL

1. OBJECTIVE

This procedure provides a uniform system for qualification and certification of nondestructive examination (NDE) personnel.

2. GENERAL

Certifications issued prior to the effective date of this revision remain valid, until recertification in that method is required. Recertification shall be in accordance with the latest revision of this procedure.

This document is to be used for certifying personnel only in the following NDE methods:

Electromagnetic Testing (ET)
Leak Testing (LT)
Magnetic Particle Testing (MT)
Liquid Penetrant Testing (PT)
Radiographic Testing (RT)
Ultrasonic Testing (UT)
Ultrasonic Testing/Thickness (UT/T)

3. REFERENCES

3.1 This procedure integrates the NDE personnel certification requirements of:

3.1.1 The American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI, 1986

3.1.2 The American Society for Nondestructive Testing, Recommended Practice No. SNT-TC-1A, August 1984 Edition, Personnel Qualification and Certification in Nondestructive Testing.

3.1.3 Final Report, NUC-MR-1A, Minimum Requirements for Qualification and Certification of Nondestructive Examination Personnel for the Nuclear Power Industry, prepared by the Ad Hoc Committee of the Electric Utility Industry.

CAUTION

NUC-MR-1A requires additional training hours in some methods (refer to Table 2). Reference the Project Quality Assurance Program Plan to determine NUC-MR-1A applicability.

4. RESPONSIBILITY

4.1 The responsibility for the administration of this procedure rests with the President of NES. The President of NES may designate an individual (the President's Designee) to be responsible for the administration and maintenance of this procedure and for the certification of Level III individuals.

4.2 The Service Line manager is responsible for maintaining those records required by this procedure. This responsibility may be delegated.

5. LEVELS OF QUALIFICATION

5.1 There are three basic levels of qualifications. Due to the various areas of expertise within each method, the certifications may be restricted to specified applications of a particular method. These restrictions, if any, are described on the employee's certification.

5.2 In the process of being qualified and certified to at least Level I, an individual is considered a trainee. A trainee works directly with a certified Level II or III individual and does not independently conduct an examination, interpret results of an examination or report the examination results.

5.3 The three basic levels of qualification are as follows: (8)

5.3.1 NDE Level I -

1. An NDE Level I individual may perform specific calibrations, and specific examinations and record data according to written procedures under the supervision of a Level II or Level III individual. A Level I may not independently calibrate equipment, perform examinations, or evaluate and report the results of any examinations.

2. An RT Level I may (subject to Radiation Safety instructions which are not a part of this program) independently make setups, and expose and develop film but is not responsible for the evaluation of the radiograph or for the acceptance/rejection of the radiographed object.

5.3.2 NDE Level II - An NDE Level II individual may set up and calibrate equipment, perform examinations and interpret and evaluate results with respect to applicable codes, standards, procedures and specifications. The NDE Level II is thoroughly familiar with the scope and limitations of the methods for which the individual is qualified and may be assigned responsibility for on-the-job training and guidance of trainees and NDE Level I personnel. The NDE Level II may organize and report the results of nondestructive examinations.

5.3.3 NDE Level III - An NDE Level III individual is responsible for establishing and approving techniques and procedures; interpreting codes, standards, specifications, and procedures; performing, interpreting, evaluating and reporting examinations; and designating the particular examination methods, techniques, and procedures to be used. The NDE Level III is responsible for the NDE operations for which qualified and to which assigned, and is capable of interpreting and evaluating results in terms of existing codes, standards, and specifications. The NDE Level III has sufficient practical background in applicable materials, fabrication, and

product technology to establish techniques and to assist in establishing acceptance criteria where none are otherwise available. The NDE Level III has general familiarity with other appropriate NDE methods, and is qualified to train and is authorized to examine and certify NDE Level I and Level II personnel for certification. (8)

6. QUALIFICATION REQUIREMENTS FOR EACH LEVEL OF CERTIFICATION

6.1 GENERAL

In order to be certified, an individual must satisfy the qualification requirements listed for the applicable level in each of the following categories.

A. Vision acuity examination (See Paragraph 6.2)
B. Education, experience and training (See Paragraph 6.3)
C. Technical examination (See Paragraph 8.0)

6.2 VISION ACUITY EXAMINATION

6.2.1 All levels of certified personnel will have their eyes examined at least annually to ensure that the following requirements are met in at least one eye:

1. Near Vision - The Jaeger J-1 Letters at a distance of at least 12 inches. An equivalent chart may be substituted, with Level III approval.

2. Distance Vision - Snellen 20/30 or equivalent, as approved by a Level III.

3. Color Perception - Demonstrated ability to distinguish and differentiate contrast between colors used in the applicable method.

This may be performed during practical examination or by viewing printed color plates. Evidence of a successful completion of a practical examination is sufficient evidence of the necessary color perception to certify the individual in that method. 8

4. If corrective lenses must be worn to pass portions of the eye examination, this shall be noted on the report and they must be worn while performing NDE Examinations as applicable.

6.2.2 Eye examinations may be performed by:

1. Opthalmologist
2. Optometrist
3. Qualified medical professionals
4. An individual instructed in the administration of a vision acuity examination.
5. A Level III Examiner

6.2.3 Eye examinations are reported on a form similar to Exhibit 2. The format may vary but the results of the above requirements are recorded.

6.3 EDUCATION, EXPERIENCE AND TRAINING

For each level of certification, experience and/or training gained with a prior employer or outside agency may be applied toward certification provided the documentation of such training and/or experience is acceptable to the certifying Level III examiner or President's Designee.

6.3.1 For initial Level I or Level II certification an employee must satisfy the following requirements.

1. Experience as specified in Table 1. The experience factor in months is based on a normal 40–hour workweek. One month is equal to 175 hours. When work is performed in excess of a 40–hour work week, credit may be based on total hours. Initial experience may be gained simultaneously in more than one method if the candidate spends at least 25% of the work time on each method for which certification is sought, and the remainder of the work time claimed as experience is spent in other NDE methods or in NDE–related activities as defined below: (10)

   - Supervision of NDE personnel.
   - Writing procedures for the performance of nondestructive examinations.
   - Classroom or other organized instruction of NDE personnel.
   - Review of NDE data for code compliance.
   - Monitoring nondestructive examinations.

   Records substantiating qualification are documented and verified prior to certification.

2. Training in a course similar to those found in Tables 1A through 1G of SNT–TC–1A and Appendix A–G of NUC–MR–1A. The length of time required for each course is found in Table 2 in correlation with the employee's education.

6.3.2 An individual may be certified directly to Level II without having been a Level I if the total months of experience equal or exceed the sum of the Level I and Level II experience shown in Table 1 and the total hours of training equal or exceed the sum of Level I and Level II training shown in Table 2 providing that the other requirements for certification are met.

6.3.3 For initial Level III certification an employee must satisfy at least one of the education and experience criteria.

1. Graduate of a four year accredited college or university with a degree in engineering or science plus two years experience in Nondestructive Examination in an assignment comparable to that of a

Level II in the applicable test method. At least one year of this experience will be in nuclear applications of the applicable examination method and include the actual performance of examinations and evaluations of the examination results.

2. Completion with a passing grade of at least two years of engineering or science study at an accredited university, college or technical school plus three years experience in Nondestructive Examination in an assignment comparable to Level II in the applicable test method. At least two years of this experience will be in nuclear applications of the applicable examination method and include the actual performance of examinations and evaluations of the examination results.

3. Five years experience in Nondestructive Examination in an assignment comparable to Level II in the applicable test method. At least two years of this experience will be in nuclear applications of the applicable examination method and include the actual performance of examinations and evaluations of the examination results.

6.3.4 Up to 75% of the experience requirements for initial Level III certification may be replaced by experience as a certified NDE Level II in other NDE methods, or in assignments at least comparable to NDE Level II, as defined below. (8)

- Supervision of NDE personnel.
- Writing procedures for the performance of nondestructive examinations.
- Classroom or other organized instruction of NDE personnel.
- Review of NDE data for code compliance.
- Monitoring nondestructive examinations.

6.3.5 Experience completed during employment with NES and applied toward initial Level III certification is documented on a detailed resume.

The candidate signs a statement attesting to the accuracy of the information contained in the resume. This experience is verified by an individual selected by the President's Designee, as evidenced by his signature on the resume.

6.4 RESTRICTED/LIMITED METHOD CERTIFICATION

Restricted or limited method certifications may be provided. The restrictions, limitations and/or removal of restriction and limitation conditions are described in the Appendices to this procedure. The Appendices are:

Appendix A Liquid Penetrant Examination
Appendix B Magnetic Particle Examination
Appendix C Radiographic Examination
Appendix D Ultrasonic Thickness

A notation describing the restriction to the certification is indicated in the "Certification Restrictions" section of the Certificate of Qualification (Exhibit 1).

6.5 ADDITIONAL QUALIFICATION

Certain specialized applications or techniques such as the UT examination of reactor vessel nozzle inner radius or the UT examination for detecting intergranular stress corrosion cracking may require training and/or qualification in excess of the requirements of this procedure. Such additional requirements are beyond the scope of this procedure for basic certification in the NDE method. They may be found in the NDE procedure used for performing the examination in question or in separate qualification procedures.

7. TRAINING PROGRAMS

7.1 Personnel being considered for initial certification complete sufficient organized training to become thoroughly familiar with the principles and practices of the specified test method related to the level of certification desired and applicable to the practices to be used and the products to be tested. The training program

includes sufficient examinations to assure the necessary information has been comprehended. (8)

7.2 A candidate for initial certification to Level III will have additional training in those activities unique to Level III as given in 5.3.3. The candidate for initial certification to Level III will also have had the training required for Level I and Level II certification in each method for which certification is to be considered.

8. EXAMINATION

8.1 GENERAL REQUIREMENTS

Examinations to verify an individual's level of certification are given to those who can satisfy the experience, education, training and vision acuity requirements. All levels of certification and recertification are by examination only. Examinations may be prepared, administered, and graded by NES or an outside agency. If examination services are provided by an outside agency, NES retains the responsibility for the adequacy of the program and the certification of personnel. The administration of NES examinations is in accordance with 8.1.1 and 8.1.2 below.

8.1.1 Level III examinations are administered by a person certified as Level III in the applicable method. Written examinations may be proctored by an individual selected by the President's Designee.

8.1.2 A Level III examiner is responsible for conducting and grading the examinations of candidates for Level I and Level II certification. However, the actual administration and grading may be specifically assigned to a Level II certified under this program in the applicable method. Written examinations may be proctored by an individual selected by the Level III examiner.

8.2 Level I and Level II examinations to verify technical qualifications consist of three parts as follows: (5)

8.2.1 General Examination

A closed book written examination consisting of at least the minimum number of questions specified in Table 3 for the applicable method and level of certification. The questions are of a general nature concerning the basic test principles relative to the applicable method. The questions are approved by a Level III examiner and the examination is conducted without access to reference material other than formulas used for calculation.

8.2.2 Specific Examination

A written examination consisting of at least the minimum number of questions specified on Table 3 under the appropriate method and level of certification. The questions will cover specific equipment, operating procedures, test techniques, specifications or codes, and acceptance criteria that the employee may encounter in his assignments. The test questions are approved by a Level III examiner. The examination is closed book except access to codes, specifications and procedures applicable to the examination may be provided. These documents are not available to the examinee during the general examination. Reference documents used are noted on the examination.

8.2.3 Practical Examination

A demonstration that the employee is familiar with and can operate the necessary equipment and analyze the resulting information to the degree required for the individual's level and scope of certification. At least one specimen selected by the Level III examiner is examined using an actual NES Examination Procedure and results evaluated by the employee being considered for certification. Failure to detect 80% of the known

indications (natural or artificial) in the test part will result in the candidate failing the examination.

Documentation of the practical examination includes:

- Description of the specimen.
- Identification of the examination procedure used.
- A report of the examination on a standard NES report form or the report form in use on the project where the examination is being performed or other suitable form.
- At least ten check points.

8.2.4 Examination questions are subject to approval by the Certifying Level III. Certification of the individual is evidence of such approval.

8.3 LEVEL III

Examinations to verify the technical qualifications of candidates for Level III certification consist of four parts.

8.3.1 Basic Examination

A written examination of at least 20 questions related to an understanding of SNT-TC-1A (1984), 15 Level II type questions selected from various NDE methods and 15 questions related to applicable materials, fabrication, and processing technology. This is a closed book examination taken without access to reference material. This examination is only required to be passed once every five years regardless of the number of methods in which certification is sought.

8.3.2 Method (General) Examination (for each method) (B)

This is a closed book examination taken without access to reference materials other than sample codes, specifications or procedures which have been issued as part of the examination. This examination consists of at least:

1. Thirty questions relating to the fundamentals and principles of the method. These questions are selected from or are similar to ASNT published Level III questions for each method.

2. Fifteen questions relating to the application and establishment of techniques and procedures relating to the method. These questions are selected from or are similar to ASNT published Level III questions for each method.

3. Twenty questions relating to capability for interpreting codes, standards, procedures and specifications relating to the method.

8.3.3 If an individual holds a current NDE Level III certificate by examination from ASNT, the possession of such a certificate is an acceptable alternative to fulfilling the Basic and Method examination requirements.

8.3.4 Specific Examination (for each method)

A written examination of at least twenty questions relating to the codes, specifications, equipment, techniques and procedures applicable to the method as practiced by NES, and to the administration of this procedure. This is a closed book examination except access to applicable codes, specifications and procedures is permitted during this examination. These documents are not available to the examinee during the basic or method examination. Reference documents used are noted on the examination

8.3.5. Practical Examination (for each method)

Each candidate for Level III certification will pass a two-part practical examination.

1. The first part is the same hands-on examination given for Level II certification in the applicable method. Failure to detect 80% of the known indications (natural or artificial) in the test part shall result in the candidate failing the examination.

2. The second part is the preparation of an examination procedure for an item described by the Level III Examiner using reference material specified by the Level III Examiner. Such reference material is identified in the resulting procedure.

8.3.6 All questions on Level III examinations are subject to approval by the President's Designee. Certification of the candidate is evidence of such approval.

9. EXAMINATION GRADING

9.1 Examinations may be graded by NES or an outside agency. When an examination is administered and graded by an outside agency, and the outside agency issues a grade of Pass or Fail, on a certified report, a score of 80% will be applied to the Pass grade in calculation of the composite score.

9.2 LEVEL I AND LEVEL II

Level I and Level II examinations administered by NES are graded by a certified Level III or other qualified individual* selected by the Level III using a composite grading system whereby the grade obtained is derived by applying a percentile weight factor to the actual grades of the various examinations. Listed below are the percentile weight factors to be used in determining the composite grade for each level of certification.

*Must be certified Level II under this program in the applicable test method.

LEVEL I & II

General (WG)	0.3
Specific (WS)	0.2
Practical (WP)	0.5

The composite grade (GC) is determined as follows:

GC=(GG X WG) + (GS X WS) + (GP X WP)

Where GC = Composite Grade
GG = Actual Grade from General Examination in Percent
WG = Percentile Weight of General Examination
GS = Actual Grade from Specific Examination in Percent
WS = Percentile Weight of Specific Examination
GP = Actual Grade from Practical Examination in Percent
WP = Percentile Weight of Practical Examination

Example:

If test results were General (GG) = 80%
Specific (GS) = 74%
Practical (GP) = 90%

And percentile weights are:

LEVEL I AND II

General (WG)	0.3
Specific (WS)	0.2
Practical (WP)	0.5

Then:

GC = (80 x 0.3) + (74 x 0.2) + (90 x 0.5)
GC = 24.0 + 14.8 + 45.0
GC = 83.8

When an examination is administered for Level I or Level II certification a composite grade of 80.0 or greater is required for certification. Each examination grade will be at least 70%, with the exception of the practical examination, which shall be at least 80%.

8

9.3 LEVEL III

Level III examinations administered by NES are graded by a Level III certified in the applicable method.

For certification, an individual must achieve a composite grade of 80.0 or greater. The composite grade is a mathematical average of the individual grades. Each examination grade must be at least 70%, with the exception of the practical examination, which must be at least 80%. If the basic and method examinations were administered by ASNT, the specific examination grade must be at least 80%.

9.4 RE-EXAMINATION

Individuals failing to pass an examination must wait at least 30 days before being re-examined unless additional training acceptable to the examiner is received. Only the part(s) of the examination which were failed need be retaken.

10. CERTIFICATION

10.1 RESPONSIBILITY

Responsibility for certification of all Level III individuals rests with the President of NES or the President's Designee. Responsibility for certification of all Level I and Level II personnel rests with certified Level III employees.

10.2 PREVIOUS EMPLOYMENT QUALIFICATIONS

10.2.1 Any prior experience, education or training claimed by the candidate that is utilized for certification must be verified by the person responsible for certification or an individual selected by the President's Designee. This experience, education or training must be documented and placed on file by the verifier. If all reasonable attempts to secure written verification are unsuccessful, a statement signed by the candidate may be acceptable if approved by the Service Line manager for Level I and II, or by the President's Designee for any level.

10.2.2 A Level I, Level II, or Level III examiner certified by a prior employer may be certified to his former level of certification based on examination in accordance with paragraph 8 provided the following conditions are met to the certifying Level III examiner's satisfaction:

1. The employee has proof of prior certification.

2. The employee was working in the capacity to which he was certified within six months of termination.

3. The employee is being certified within six months of his termination.

4. If item 2 or 3 above cannot be satisfied, the individual must complete a minimum of 1 hour of refresher training in the NDE method prior to certification.

10.2.3 An individual who has met the training and experience requirements for a higher level of certification with a former employer but was not certified to that level, may be certified by examination to that higher level if the individual has proof of the training and experience required for the higher level of certification satisfactory to the certifying Level III examiner and the requirements of 2. thru 4. above are met.

10.3 CERTIFICATION PROCEDURE

The Level III examiner responsible for certifying an individual signs a Certificate of Qualification (Exhibit 1) which certifies that the individual has satisfied all of the qualification requirements of this procedure for the applicable level of certification. If the certification is restricted to a particular application of the method, the restriction is noted in the "Certification Restrictions" section of the Certificate of Qualification.

10.4 CERTIFICATION DOCUMENTATION

The Service Line manager, is responsible for assuring the following documentation is on file:

10.4.1 A copy of revisions to this document under which personnel are currently certified.

10.4.2 Personnel records of certified individuals containing:

- Name of the individual.
- Level of certification and NDE method.
- Completed Certificate of Qualification similar to Exhibit 1.
- Documentation of required educational background of certified individuals.
- Documentation of required experience of certified individuals.
- Statements and records of satisfactory completion of required training.
- A vision acuity report (Exhibit 2) referenced by the current Certificate(s) of Qualification.

- Current examinations administered by NES and grades for all previous examinations. 8

- Results of current examinations expressed in actual grade percent, percentile weight and composite or average score.

- Statement or other documentation supporting yearly verification of work performed in the method.

- Dates of certification and/or recertification and the dates of assignment to NDE.

- Signature of the certifying Level III examiner.

10.4.3 Records of additional qualification as described in 6.5 above are maintained as above but need not be recorded on the Certificate of Qualification (Exhibit 1).

10.5 This procedure addresses only those records which must be kept at the NES home office for currently certified individuals. The requirements for historical and jobsite records may be found in other documents.

11. RECERTIFICATION

11.1 Recertification of Nondestructive Examination employees is specified by the code, standard, procedure or customer requirement under which the employee is working, but in all cases a Level I or Level II examiner is recertified by examination every three years and a Level III examiner is recertified by examination every five years.

11.2 Evidence that the individual has functioned in the capacity for which he is certified is verified on a yearly basis. Verification is accomplished by one of the following:

- A statement, signed by a site supervisor or management personnel, which states that the individual functioned in the capacity for which certified.

- An NES time sheet which lists work performed in the particular method, and which is signed by a site supervisor or management personnel.

- A copy of an actual inspection report form which has been submitted to, and approved by, the customer and which has been signed by the certified individual.

- A performance demonstration of an examination and completion of an examination data sheet which is verified and co-signed by a Level III examiner.

11.3 An individual's certification may be revoked at any time at the discretion of the NES Level III examiner. Revoked certifications may be reinstated following resolution of the Level III's concern and appropriate actions as determined by the Level III. Details of the revoked certification and/or reinstatement will be documented by the Level III and placed in the individuals file.

11.4 An individual's certification is revoked when the individual's employment by NES is terminated. (9)

12. INTERRUPTED SERVICE

Certified employees who have been inactive or whose employment by NES is interrupted for less than one year may be reinstated to their prior certification level without re-examination if the original expiration date has not passed.. Certified employees who have been inactive or whose employment by NES is interrupted for one year or longer will have the original certification reinstated after successful completion of a practical examination or verification that he has been active in the method within the past year. Reinstated certifications will expire on the original date.

TABLE 1

EXPERIENCE REQUIREMENTS

The figures below represent the experience requirement in months necessary for certification in each of the listed NDE methods.

LEVEL I CERTIFICATION

Documented experience as a trainee, under the direction of a certified Level II or Level III individual.

Radiography (RT)	3 Months	Electromagnetic Testing (ET)	1 Month
Magnetic Particle (MT)	1 Month	Leak Testing (PCMT)*1.5 Months	
Ultrasonic (UT)	3 Months	Leak Testing (MSLT)**	4 Months
Liquid Penetrant (PT)	1 Month	Ultrasonic-Thickness (UT/T)	1 Month

LEVEL II CERTIFICATION

Documented experience as a certified Level I

Radiography	9 Months	Electromagnetic Testing	9 Months
Magnetic Particle	3 Months	Leak Testing (PCMT)*	4 Months
Ultrasonic	9 Months	Leak Testing (MSLT)*	6 Months
Liquid Penetrant	2 Months	Ultrasonic-Thickness (UT/T)	2 Months

DIRECT LEVEL II CERTIFICATION

If the experience of an individual without prior SNT-TC-1A type certification equals or exceeds the sum of the months shown above for Level I plus Level II, the individual may, upon meeting the other requirements for certification, be certified as a Level II without having been certified as a Level I.

*PCMT - Pressure Change/Measurement Test

** MSLT - Mass Spectrometer Leak Test

TABLE 2

TRAINING REQUIREMENTS

The reference training is in hours and is the minimum acceptable to qualify for certification listed. The hours shown in parenthesis correspond to the requirements of NUC-MR-1A.

Level I

	RT*	MT	UT	UT/T	PT	ET	PCMT	MSLT
High School	39	12	40	20	4(8)	12(40)	24	40
Grammar School	88	24	40	20	12	48	60 (96)	60
College	29	8	24	20	4	8	16	28

Level II (In Addition to level I above)

	RT*	MT	UT	UT/T	PT	ET	PCMT*	MSLT*
High School	40(48)	8	40	20	8	8(30)	16	24
Grammar School	80	16	80	20	16	24(30)	80	80
College	35	4	40	20	4	8	12	16

Level II (Direct certification)

If the training of an individual without prior SNT-TC-1A type certification equals or exceeds the sum of the times shown above for Level I and Level II, the individual may, upon meeting the other requirements for certification, be certified as a Level II without having been certified as a Level I.

NA - Not Acceptable

High School: High school graduation diploma or equivalent.

Grammar School: Successful completion of at least the ninth grade.

College: Completion with a passing grade of at least two years of engineering or science study in a university, college or technical school.

*RT - These totals do not include required radiation safety training time.

TABLE 3

EXAMINATION REQUIREMENTS

The numbers listed indicate the minimum number of questions required for certification.

Level I

	RT	MT	UT	UT/T	PT	ET	PCMT	MSLT
General	40	30	40	20	30	40	20	20
Specific	20	20	20	20	20	20	20	20
Practical	D	D	D	D	D	D	D	D

Level II

	RT	MT	UT	UT/T	PT	ET	PCMT	MSLT
General	40	30	40	40	30	40	20	20
Specific	20	15	20	20	15	20	15	50
Practical	D	D	D	D	D	D	D	D

Level II Total - Direct Certification

	RT	MT	UT	UT/T	PT	ET	PCMT	MSLT
General	40	30	40	40	30	40	20	20
Specific	20	15	20	20	15	20	15	50
Practical	D	D	D	D	D	D	D	D

D - Demonstrations, as described in main document

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810 (203) 796-5000

File: John Doe

CERTIFICATE OF QUALIFICATION

ULTRASONIC EXAMINATION

LEVEL II

John Doe is qualified as Level II in Ultrasonic Examination in accordance with the requirements of Nuclear Energy Services' Procedure for Certifying Nondestructive Examination Personnel, No. 80A9068, Revision 9, which incorporates the requirements of SNT-TC-1A, 1984 Edition. This certification is valid only during employment with Nuclear Energy Services.

CERTIFICATION RESTRICTIONS	Manual Only	SEE ATTACHED VISION ACUITY REPORT		
EDUCATION	High School Graduate Royalton-Hartland Central Middleport, New York	Date Completed: 06-30-76	COLLEGE OR TECHNICAL	Nondestructive Testing United States Navy San Diego, California	Date Completed: 10-30-80

TRAINING

Institution/Organization	Location	Type	Date Completed	Hours
United States Navy	San Diego, California	Theory and Lab.	10-30-80	279.00

Total: 279.00

NES EXPERIENCE

ULTRASONIC EXAMINATION ASSIGNMENTS
(List up to 12 UT assignments.)

ISI: None Mile Point 1
PSI: Shearon Harris
ISI: Three Mile Island
PSI: Nine Mile Point 2
ISI: V[illegible] Summer

EXPERIENCE AT EACH LEVEL OF UT CERTIFICATION

From	To	Level	Type	Months
01-20-86	02-12-86	Trainee	Nuclear	0.70
02-12-86	07-18-86	I	Nuclear	5.13
07-18-86	12-11-87	II	Nuclear	14.50
12-11-87	07-18-89	II	Nuclear	19.00
07-18-90	present	II		

Total: 39.39

PREVIOUS EXPERIENCE

Employer	Location	EMPLOYMENT DATES From	To	UT EXPERIENCE Level	Type	Months
United States Navy	San Diego, California	12-15-80	03-02-83	II	Non-nuclear	26.56
Southern NDE Services	Palm Beach, Florida	01-16-94	07-27-84	Insp.	Non-nuclear	2.00

* Non-continuous employment

Total: 28.56

TOTAL EXPERIENCE

67.95 months of experience in ultrasonic examination

CERTIFICATION EXAMINATIONS

General Examination	85.50	(.3)	Exams administered:
Specific Examination	90.00	(.2)	07-17-89
Practical Examination	95.00	(.5)	Exams completed:
Composite Score	91.15		07-18-89

INITIAL CERTIFICATION DATES

Prior employment initial Level II certification: 12-15-80
Initial Level II certification issued by NES: 07-18-89

CERTIFIED BY

LEVEL III EXAMINER

DATE OF CERTIFICATION Date of Level III signature
DATE OF EXPIRATION 07-17-92

Certification documentation is maintained by Nuclear Energy Services in Danbury, Connecticut.

EXHIBIT 1

8

VISION ACUITY EXAMINATION REPORT

NAME: _____ DATE: _____

EXAMINATION RESULTS:

	NEAR VISION	
	UNCORRECTED	CORRECTED
RIGHT EYE:	_____	_____
LEFT EYE:	_____	_____
Passing: J1	PASS/FAIL	PASS/FAIL
	DISTANCE VISION	
	UNCORRECTED	CORRECTED
RIGHT EYE:	20/ _____	20/ _____
LEFT EYE:	20/ _____	20/ _____
Passing: 20/30	PASS/FAIL	PASS/FAIL

SAMPLE ONLY SIMILAR VERSIONS WHICH REQUIRE THE SAME INFORMATION ARE ACCEPTABLE

The above individual was given an eye test for near vision acuity using the Standard Jaeger Chart and the Snellen Chart for far distance acuity for NDE certification in accordance with NES Procedures 80A9068 and 80A9069.

COLOR VISION

Distinguishing pertinent colors has been verified by Ishihara's test plate numbers ____ for Color Blindness.

_____	_____	_____
EXAMINED BY	TITLE	DATE

The ability to distinguish contrasting colors has been demonstrated by a practical examination in the methods listed below.

MT	_____	_____	ET	_____	_____
PT	_____	_____	LT	_____	_____
RT	_____	_____	VT	_____	_____
UT	_____ EXAMINED BY	_____ DATE	UT/T	_____ EXAMINED BY	_____ DATE

EXHIBIT 2

APPENDIX A

LIQUID PENETRANT EXAMINATION

A. Categories

1. There are two categories of Liquid Penetrant certification.
   a. Color contrast only.
   b. Unrestricted.

2. Level III personnel are certified in the unrestricted category only.

3. Certification in accordance with this procedure, for all levels, allows the certified individual to use the solvent removable, water washable or post emulsifiable process.

4. Personnel whose certification is limited to color contrast penetrants only may perform only the precleaning, penetrant application, and post-examination cleanup steps of a fluorescent penetrant examination.

B. Testing

1. The same general examination may be used for either category of certification. Questions pertain to both the color contrast and fluorescent processes.

2. The same specific examination may be used for either category of certification.

3. For Level I or II certification, an individual who performs a practical examination using only the color contrast process receives a restricted certification, with the exception of 5 below.

   For Level I or II certification, an individual who performs a practical examination using a fluorescent penetrant process receives an unrestricted certification.

4. An individual who is certified for color contrast, may receive an unrestricted certification by passing a fluorescent process practical examination in the liquid penetrant method with a grade of at least 80%. In this case, a new Certificate of Qualification is issued and "Unrestricted" is noted in the "Certification Restrictions" section of the form. 8

   The expiration date of the certification remains as it was when restricted to color contrast only.

5. An individual who is already certified unrestricted MT and who holds a current certification in color contrast PT, may receive an unrestricted PT certification.

APPENDIX B

MAGNETIC PARTICLE EXAMINATION

A. Categories

1. There are two (2) categories of MT certification:

   a. Visible
   b. Unrestricted

2. Level III certification is Unrestricted.

B. Testing

1. The same general examination may be used for any category of certification if it contains questions applicable to Visible and Fluorescent. General Examinations applicable to only a single category may be administered for a restricted certification.

2. The same specific examinations may be used for any category of certification.

3. Level III individuals must pass a Method examination containing questions on both the visible and fluorescent process.

4. An individual who is certified in the Visible category may be additionally certified in the Unrestricted category upon passing the fluorescent practical examination with a grade of at least 80%. If the individual's original general examination was applicable to only the visible process, a general examination containing questions on both processes is administered

and passed with a grade of at least 80%. In this case, a new Certificate of Qualification is issued and "Unrestricted" is noted in the "Certification Restrictions" section of the form. The expiration date of the certification remains as it was prior to the change in restrictions. B

APPENDIX C

RADIOGRAPHIC EXAMINATION

A. 1. There are six categories of RT certification:

1. Gamma Only.
2. Gamma Only without Film Intepretation.
3. X-Ray Only.
4. X-Ray Only without Film Interpretation.
5. Film Interpretation Only.
6. Unrestricted.

2. Level II individuals may be given a category of certification which restricts them from film interpretation, or to film interpretation.

3. Level III personnel are certified in the unrestricted category only.

4. Certification in accordance with this procedure, for all levels, is for film radiography only. Individuals performing Fluoroscopy or other real-time imaging radiography are certified as required by the project documents.

B. Testing

1. Three types of general examinations may be given which will lead to Gamma, X-ray or Unrestricted certification.

2. The specific examination may be the same for each type of certification.

3. A practical examination is given corresponding to the type of certification sought.

The practical examination for Level I individuals consists of the production and quality evaluation of a satisfactory radiograph.

The practical examination for Level II individuals consists of two parts, each of which must be passed with a grade of at least 80%. The average score of the two parts is used in computation of the composite grade.

The first part is the production and evaluation of an acceptable radiograph. The second part consists of the interpretation of at least ten (10) radiographs which display various types of material/film/technique defects.

An individual restricted to film intepretation need not take the first part of the practical examination.

An individual restricted from film interpretation need not take the second part of the practical examination.

An individual failing the film interpretation portion of the practical examination may be certified as a Level II restricted from film interpretation.

C. Upgrading

1. To upgrade a Gamma Only or X-ray Only certification to an Unrestricted certification, the individual must pass the unrestricted general examination, and the Gamma and X-ray practical examination.

2. To remove a No Film Interpretation restriction, the film interpretation portion of the practical examination must be passed with a grade of at least 80%.

3. When an individual's certification is upgraded, a new Certificate of Qualification is issued and "Unrestricted" or the upgraded restrictions are noted in the "Certification Restrictions" section of the form. The expiration date of the original certification remains unchanged.

APPENDIX D

ULTRASONIC THICKNESS

A. General

1. This Appendix provides conditions unique to the Ultrasonic Thickness method (UT/T).

B. Training and Experience

1. Training and experience requirements for UT/T are shown in Tables 1 and 2.

C. Testing

1. The UT general or specific examination may be used for UT/T certification or special UT/T examinations with the minimum number of questions as shown in Table 3 may be administered for the UT/T qualification.

2. A separate practical examination is given for the Thickness Technique. For UT Thickness practical examination, the calibration of an ultrasonic flaw detection instrument as well as a Digital Thickness instrument is required. Also measurements on a prescribed test sample using both instrument types are required. This examination is performed in accordance with a procedure acceptable to the certifying Level III.

3. An individual presently holding a UT Level I certificate need not take the UT/T written examinations.

4. When an individual presently certified for thickness is upgraded to the UT method, a new Certificate of Qualification is issued and "Unrestricted" is noted in the "Certification Restrictions" section of the form. The expiration date of the original certification remains unchanged. The additional training received to comply with Table 2 is noted in the training section of the Certificate of Qualification.

5. A Level II UT authorized by a Level III may proctor the examinations for UT/T. (3)

13.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

FOR INFORMATION ONLY

SPECIAL PROCEDURE

SP-1222

ULTRASONIC EXAMINATION OF VESSEL WELDS GREATER THAN TWO INCHES IN THICKNESS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/12/93

Expiration Date 2/11/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 24UG93
Manager - Technical Support — Date

CONTROLLED RECIPIENT ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 35	0

ULTRASONIC EXAMINATION

OF VESSEL WELDS

GREATER THAN

TWO INCHES IN THICKNESS

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

oject Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	DIRECTOR, ISI	
0	Scott Larson				
1	Scott Larson	Scott Larson 5-21-93	E. Dubberly 5-24-93	E. Dubberly 5-24-93	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6031

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	4/30/93	3	Para. 2 to allow for examination of closure head	[signature]
			welds per CRA #8624	

FORM # NES 206 3/90

1. PURPOSE

The purpose of this procedure is to define the technique, recording criteria and equipment for the Ultrasonic (UT) examination of vessel welds in ferritic material greater than 2 inches in thickness.

2. SCOPE

This procedure is limited to the manual UT examination of welds in ferritic steel vessels greater than 2 inches thick, including nozzle to shell welds. Reactor Pressure Vessel Closure Head welds are within the scope of this procedure. 1

3. REFERENCES

3.1 ASME B&PV Code, Section XI; -1986 Edition

3.2 ASME B&PV Code, Section V, Article 4; -1986 Edition

3.3 80A9053, NES Procedure for Ultrasonic Instrument Linearity Verification

3.4 80A9068, NES Procedure for Certifying Nondestructive Examination Personnel

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with references 3.1 and 3.4.

4.2 It is recommended that examination crews consist of at least two members. At least one member of each crew shall have a minimum certification of Level II. Evaluations shall be conducted by an examiner with a minimum certification of Level II.

4.3 A copy of each examiner's certification summary and current eye test shall be maintained on-site.

4.4 A copy of each examiner's certification summary and current eye test shall be submitted to the Plant Owner or his Agent, prior to performing examinations in accordance with this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT

A pulse echo ultrasonic flaw detection instrument with current linearity which operates within the minimum frequency ranges of 1.0 MHz to 5.0 MHz shall be used. This shall be equipped with a stepped gain control calibrated in units of 2dB or less.

5.2 SEARCH UNITS

A. Prerequisites

1) Search units may contain either single or dual transducer elements. Units with contoured wedges may be used.

2) Angle beam and 0° search unit sizes will be dependent on the size of the area to be scanned, surface configuration, and component geometry.

B. Size

1) Angle beam search unit size shall not exceed 1" diameter or 1"x1".

2) 0° search unit element size shall not exceed 1" diameter or 1"x1".

NOTE: For dual element search units the dimension applies to one of the two elements.

C. Frequency

2.25 MHz is the recommended frequency. Other frequencies may be used if necessary to improve signal to noise ratio.

D. Beam Angle

1. The examination shall generally be performed using a 0° and nominal 45° and 60° angle beam search units. Other pairs of angles are permitted provided the measured difference between the angles is at least 10°, the UT Level III is notified, and the notification documented on the Ultrasonic Calibration Data Sheet (Figure 1).

2. The beam angle in the production material shall be within the range of 35° to 70° perpendicular to the contact surface.

5.3 CABLE

Cables shall have appropriate connectors and may be any convenient length. Examinations shall be performed using the same cable as that used during the calibration.

5.4 COUPLANT

Ultragel – or couplant supplied by the Plant owner.

5.5 CALIBRATION BLOCK(S)

A. Calibration blocks shall be selected and provided by the Plant Owner and shall as a minimum, contain reflectors that enable calibration as required in Section 7 of this procedure.

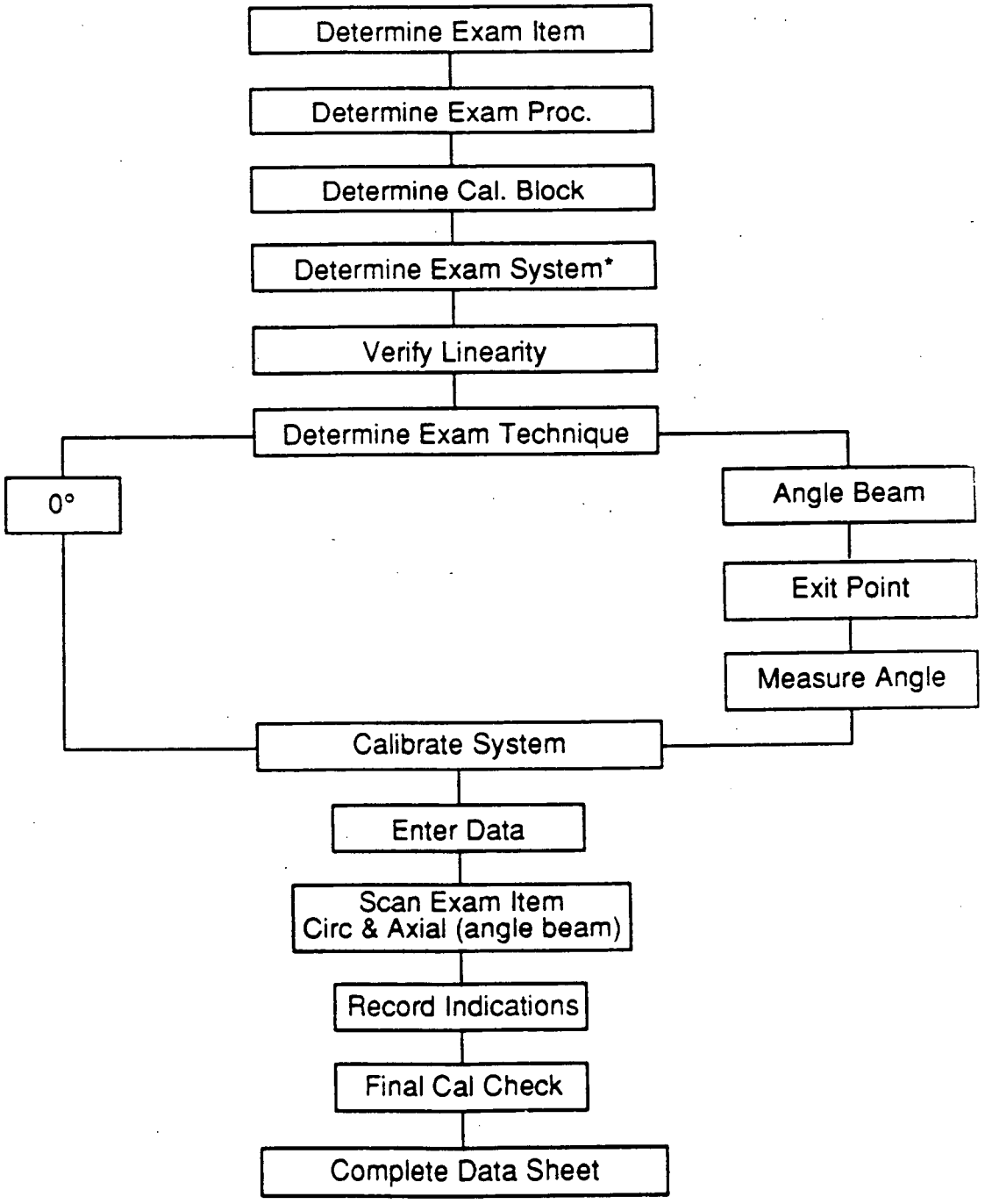
B. IIW Calibration Standards

These may be either full size or miniature IIW standards and shall be fabricated from Carbon Steel.

6. GENERAL PREREQUISITES

The following flow chart describes a typical examination sequence:

EXAMINATION SEQUENCE



*System = Instrument, Transducer, Wedges, and Cable.

6.1 The components to be examined shall be identified/determined by the plant owner.

6.2 Calibration blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the Plant Owner, e.g. the examination surface shall be free of foreign matter which may interfere with Ultrasonic transmission.

6.4 Each weld to be examined shall be identified by the Plant Owner with reference points sufficient to locate the search unit along the weld seam.

NOTE: The examiner shall notify the NES "lead individual" or other designated contact individual when preparation of the scanning surface(s) and identification of reference points are not suitable for the ultrasonic examination.

6.5 Previous examination data provided by the Owner, shall be reviewed by the examiner and the following items should be identified:

(A) Interfering conditions

(B) Weld configuration

(C) Obstructions

(D) Recordable indications

(E) Previous examination technique

(F) Previously measured angle in the component

6.6 The required angle beam method of examination is the 1/2 Vee technique. Where conditions exist that interfere with the scanning of required examination volumes the examination technique shall be modified to examine the maximum volume possible.

NOTE: Modifications to any technique in this procedure shall be approved by a UT Level III. Documentation of this shall be attached to the Ultrasonic Calibration Data Sheet.

6.7 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows:

(1) Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

(2) Screen height and amplitude control linearities should be performed daily (while in use).

6.8 The calibration block surface temperature shall be within 25° F of the component to be examined.

7. CALIBRATION PROCEDURE

7.1 PREREQUISITES

A. Verify that the designated calibration block is correct for the specific item to be examined. Notify the NES "lead" or other designated individual, if a discrepancy is noted.

B. If the calibration block does not contain the reflectors required to perform the calibration techniques identified in this section, the Plant Owner shall be notified and the examination not performed.

C. Calibration shall be performed from the surface of the calibration block which corresponds to the component surface to be scanned.

D. The calibration shall be performed with the contoured or contact wedges used during the examination.

E. Dual Search Units

(1) When using dual search units, component thickness and focal distance shall be compatible. Compatibility is determined by the existence of a signal to noise ratio of at least 10:1 when scanning the ID notch in the component calibration block. Where this is not achievable, the UT LIII shall be notified and an explanation documented on the Ultrasonic Calibration Data Sheet (Figure 1).

(2) Half Vee techniques only, shall be used.

F. The search unit actual sound beam exit point shall be determined and marked on the wedge.

G. Measure the wedge exit point to–front–edge dimension and record in the Search Unit Remarks section on the Ultrasonic Calibration Data Sheet (Figure 1). Record as Exit Point to Front Edge: _____".

H. Maximum response from calibration reflectors shall be obtained with the sound beam essentially perpendicular to the axis of the calibration reflector. The center line of the search unit shall be at least 3/4" from the nearest side of the block or pipe. Rotation of the beam into a corner formed by the reflector and the side of the block may produce a higher amplitude signal at a longer beam path; this beam path shall not be used for calibration.

I. Measured beam angle shall be determined by using a Carbon Steel IIW Block or using the reflectors in the component calibration block. Note in the Search Unit Remarks section on the Ultrasonic Calibration Data Sheet when a component calibration block and its identification number is used for search unit angle check(s).

J. Beam spread measurement shall be performed in accordance with Reference 3.2.

K. The examiner should avoid using a sweep calibration that uses only a small portion of the CRT presentation.

7.2 0° CALIBRATION FOR DETECTING LAMINAR REFLECTORS IN UNCLAD MATERIAL.

NOTE: In the event that the material under examination contains clad on the opposite surface or where material properties cause calibration to be inadequate or unreliable, calibration shall be performed as stated on Section 7.3.

A. Sweep range calibration should be performed using a metal path calibration that will display at least the maximum wall thickness.

B. The 0° search unit shall be coupled to the examination material. The initial back reflection shall be adjusted to and maintained at 80% ± 5% FSH. When the opposing surfaces are non–parallel and a back reflection is unobtainable, calibration shall be performed as in Section 7.3.

7.3 0° CALIBRATION FOR THE EXAMINATION OF WELD REQUIRED VOLUME

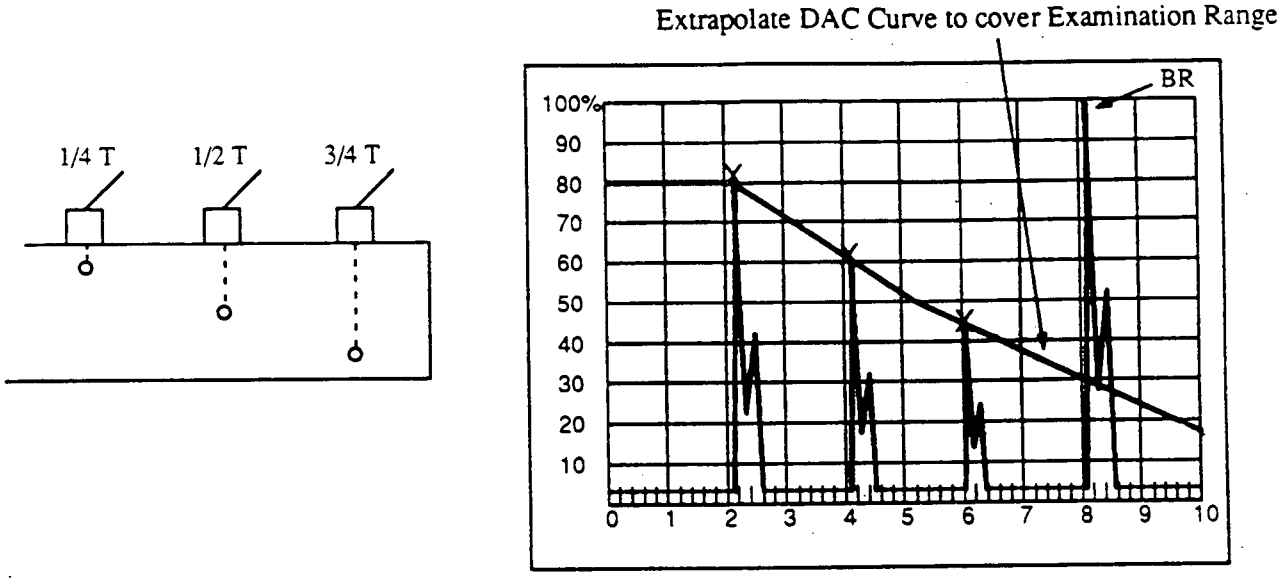
A. Sweep range calibration should be performed using a metal path calibration that will display at least the maximum wall thickness.

B. Distance Amplitude Correction (DAC) calibration shall be performed by obtaining the maximum response from the side drilled hole (SDH) which yields the highest amplitude.

C. Set this signal at 80% ± 5% FSH and mark the peak on the CRT screen. This **establishes reference sensitivity**. Position the search unit for maximum response from the two remaining reflectors and mark their peaks on the CRT screen. Connect the marks and extend the line to cover the required thickness. Record all settings on the Ultrasonic Calibration Data Sheet (Figure 1).

NOTE: The use of an electronic DAC is not permitted.

D. Refer to para 7.7 for verification of scanning speed and pulse repetition rate.



0° CALIBRATION FOR WRV

7.4 1/2 VEE ANGLE BEAM CALIBRATION (REQUIRED TECHNIQUE)

7.4.1 Unclad Material Calibration

A. Establish sweep range calibration as appropriate using the metal path formulas found in Figure 6.

B. DAC calibration shall be established by using the 1/4T, 1/2T 3/4T and 5/4T SDH.

C. Maximize the signal from the reflector which yields the highest amplitude.

D. Adjust the gain control(s) to provide a signal amplitude of 80% ± 5% FSH and mark its peak on the CRT screen. **This establishes reference sensitivity.**

E. Position the search unit for maximum response from the 3 remaining reflectors and mark their peaks on the CRT screen.

F. Maximize the signal from the opposite surface notch. Mark its position and amplitude on the CRT Screen.

NOTE: This notch will be used only when evaluating indications at the opposite surface.

G. Connect all the signal amplitude peaks (except for the opposite side notch) marked on the CRT screen. This establishes the DAC. Record all settings on the Ultrasonic Calibration Data Sheet (Figure 1).

H. Refer to para 7.7 for verification of scanning speed and pulse repetition rate.

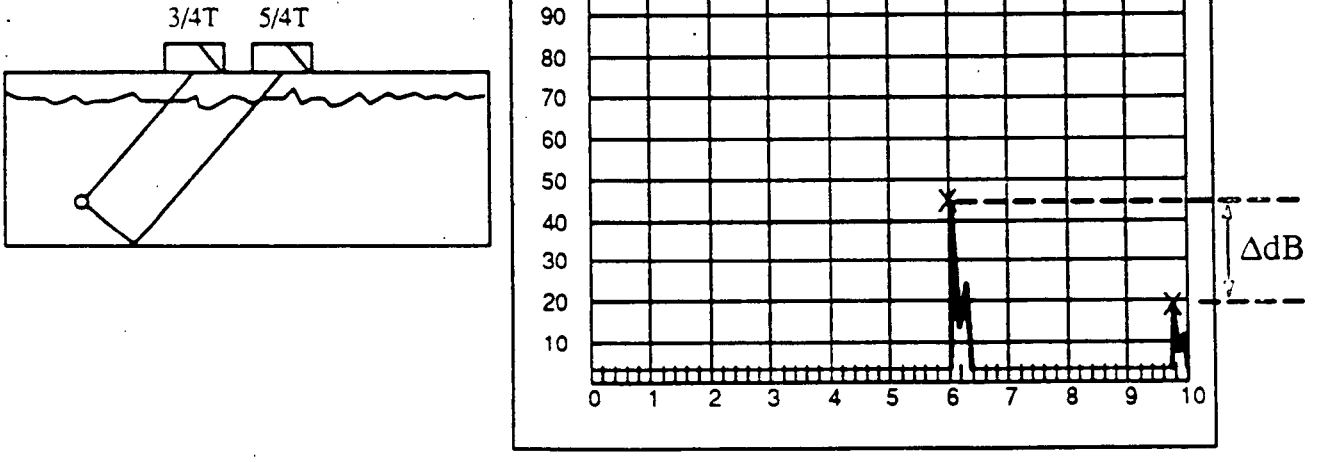
7.4.2 Cladded Material Calibration

NOTE: When calibrating on clad calibration blocks with the transducer on the UNCLAD surface, anomalies due to acoustic impedance at the clad to base metal interface as well as sound redirection from the clad itself may occur. This condition can affect the shape and slope of the DAC curve after the sound enters and exits the clad. In order to eliminate this condition follow the directions below.

A. Establish sweep range calibration as appropriate, using the metal path formulas found in Figure 6.

B. Place the transducer on the CLAD side of the calibration block and note the Δ dB (difference in dB) between the responses from the 3/4 and the 5/4T holes.

C. Mark the position of the 5/4T hole on the CRT.



D. Place the transducer on the unclad side of the block and construct the DAC curve as instructed below: (E thru H)

E. At this point, DAC calibration shall be established by using the 1/4T, 1/2T and 3/4T holes only.

F. Maximize the signal from the reflector that yields the highest amplitude.

G. Adjust the gain control(s) to provide a signal amplitude of 80% ± 5% FSH and mark its peak on the CRT screen. **This establishes reference sensitivity.**

H. Position the search unit for maximum response from the 1/2T and 3/4T holes and mark their peaks on the CRT screen.

I. Determine the amplitude for the 5/4T hole by positioning the transducer for the 3/4T hole at the maximum amplitude position, then decrease the gain by the Δ dB determined in B above.

J. Mark the height of this signal amplitude on the CRT, at the 5/4T position as established in C above.

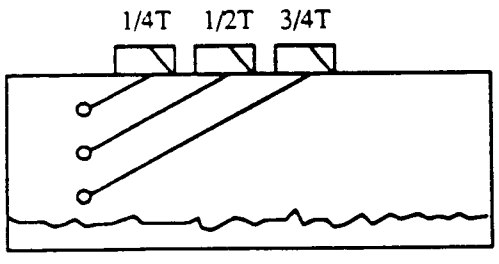
K. Maximize the signal from the opposite surface notch. Mark its position and amplitude on the CRT screen.

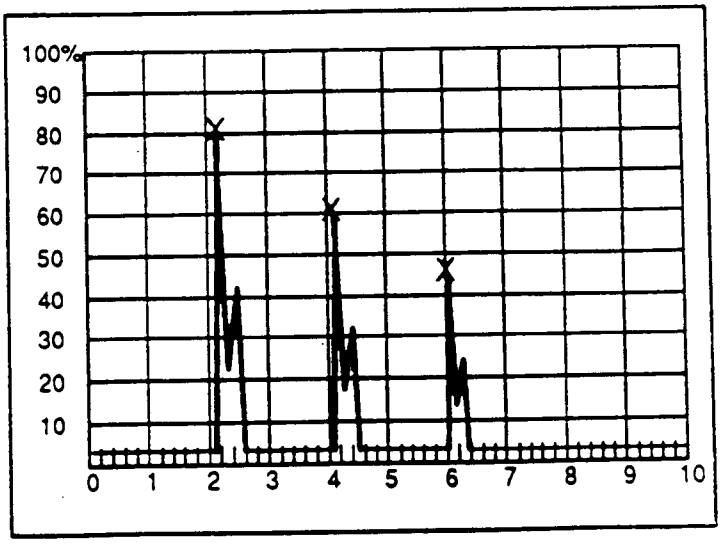
L. Connect all the signal amplitude peaks (except for the opposite surface match) marked on the CRT screen. This establishes the DAC curve.

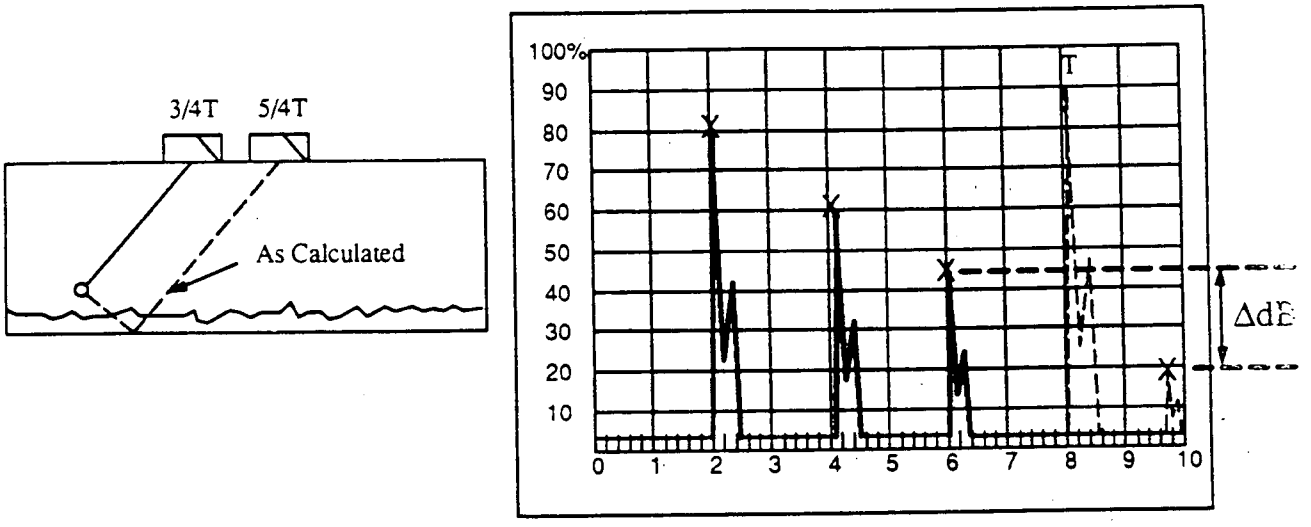
M. Record all settings on the Ultrasonic Calibration Data Sheet (Figure 1).

N. Refer to para 7.7 for verification of scanning speed and pulse repetition rate.

NOTE: This notch referenced in (K) above will be used only as a comparison when evaluating indications at the opposite surface.







7.5 FULL VEE AND 1-1/2 VEE ANGLE BEAM CALIBRATION (SUPPLEMENTAL TECHNIQUE FOR UNCLAD MATERIAL)

A. Establish sweep calibration.

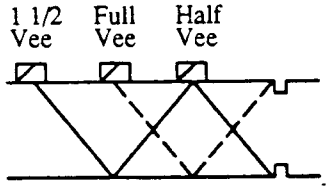
B. Obtain maximized signal responses from the notches and mark the signal response positions on the instrument's CRT screen.

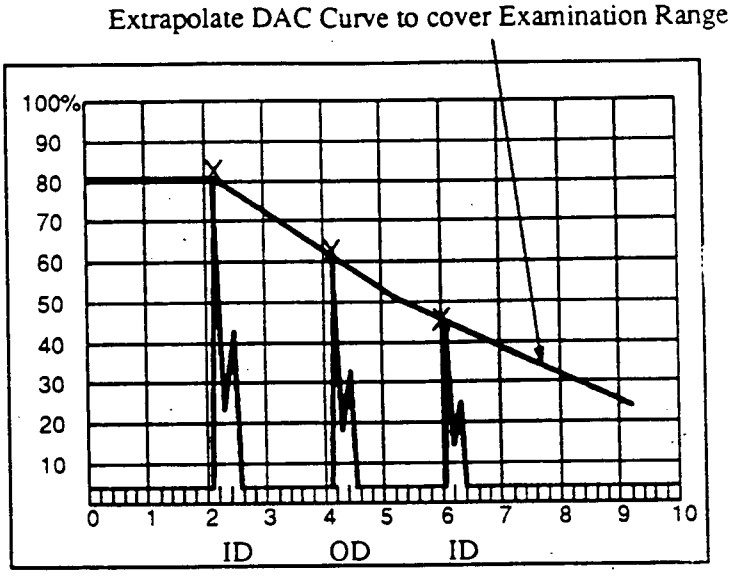
C. Maximize the signal from the notch producing the highest response and set its amplitude to 80% FSH. **This establishes reference sensitivity.**

D. Without changing sensitivity settings, maximize the remaining notch response(s) and mark the peak amplitudes on the CRT screen, and on the Calibration Data Sheet.

E. Plot a DAC curve by connecting the locations (marked on the CRT) with a continuous line extended to cover the full examination range.

F. Upon completion of calibration, ensure that all data and instrument settings are recorded on the Calibration Data Sheet.





1 1/2 VEE CALIBRATION

7.6 DOUBLE DAC

High attenuation, too high a transducer frequency or too small a transducer, may cause the slope of the DAC to fall below 20% FSH within the calibration area of the CRT screen. If this condition is still apparent after changing the size and/or frequency of the transducer, the following correction shall be made:

A. Note the point where the DAC curve drops below the 20% line.

B. Mark this point on the CRT screen and increase the gain by +6db.

C. Mark the new location of the reflector that previously appeared below the 20% line.

D. Return to the previous reflector that was originally above 20% and mark its new amplitude on the CRT screen.

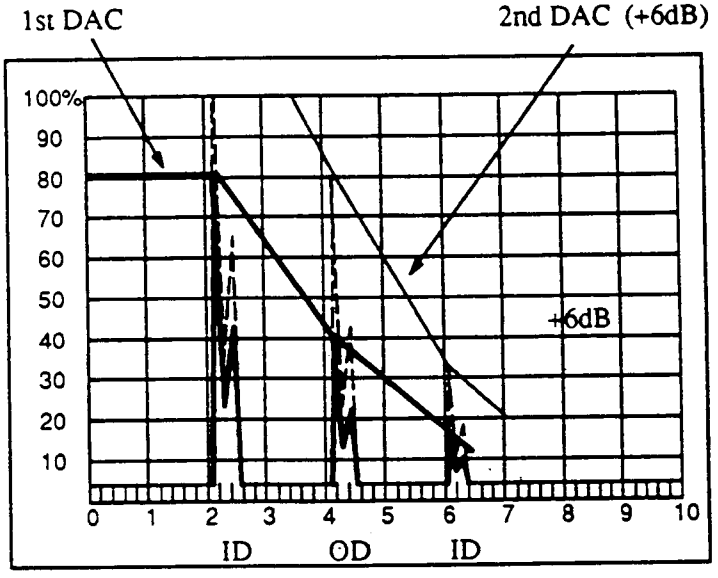
E. Connect the two new points established in 7.6.C and 7.6.D to establish the second DAC curve.

F. Extend the curve if necessary to cover the examination area.

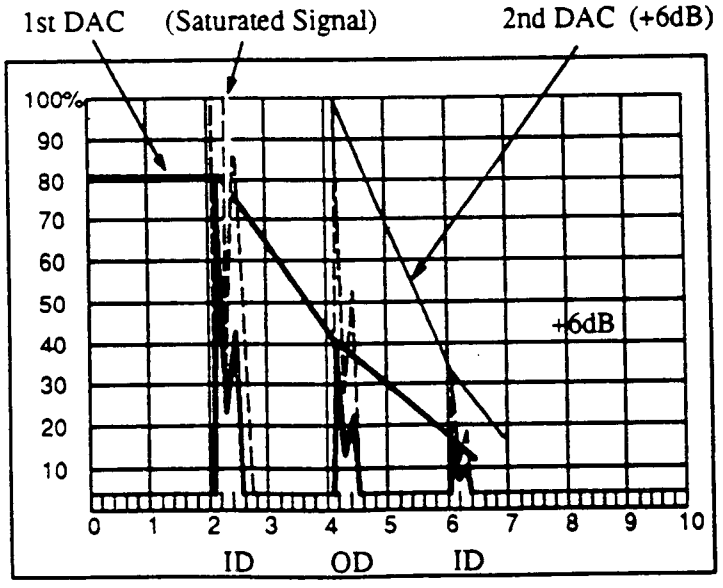
G. Record the new positions and settings on the calibration data sheet.

H. Refer to para 7.7 for verification of scanning speed and pulse repetition rate.

NOTE: Where the amplitude of the reflector referenced in "D" above increases to a level that exceeds FSH, set this signal amplitude at 100% FSH and create the second DAC using the signal from this reflector as the starting point and the signal from the next reflector as the second point on the DAC. Connect the two points. This is now the second DAC. Record data as in "G" above. (See Example 2 below.)



DOUBLE DAC EXAMPLE 1



DOUBLE DAC EXAMPLE 2

7.7 PULSE REPETITION RATE AND SCANNING SPEED

A. To verify an acceptable pulse repetition rate and scanning speed a dynamic calibration at maximum scanning speed (not to exceed 6 inches per second) shall be used.

B. Verify that at least 3 of the basic calibration reflectors in the appropriate calibration block are within ± 2dB of the static calibration response when scanned at scanning speed.

C. If the instrument to be used has an operator selectable/adjustable pulse repetition rate feature, then the repetition rate used shall be noted in the Instrument Remarks section on the Ultrasonic Calibration Data Sheet (Figure 1).

8. EXAMINATION PROCEDURE

NOTE: "System" = Instrument, Transducer, Wedges and same Cable type and length.

8.1 SYSTEM CALIBRATION

Perform the complete ultrasonic examination system calibration, establishing the DAC curve, within one day prior to use of the system for examination of those welds for which the calibration is applicable, and at least once each week during the examination, or at any time that any part of the system is changed.

NOTE: When necessary to replace a cable (even one of the same type and length) system calibration shall be verified. The verification may be delayed until after completion of the examination(s) in progress. However, the requirements of paragraph 8.2 concerning variations in DAC amplitude, sweep and reexamination shall apply.

8.2 SYSTEM CHECK

A. Verify the system calibration (instrument sensitivity and sweep range calibration) at the following intervals:

(1) At the start and finish of examinations for which the calibration applies.

(2) At intervals not to exceed 12 hours. (Recommended 4 hour intervals)

(3) With every change of examination personnel.

(4) If the examiner suspects any malfunction of the UT system.

B. If any point on the DAC curve has decreased 20% or 2db of its amplitude, all data sheets since the last calibration shall be made and recorded invalid. A new calibration shall be made and recorded and the affected examination areas re–examined.

C. If any point on the DAC curve has increased more than 20% or 2db of its amplitude, recorded indications taken since the last valid calibration shall be re–examined with the correct calibration and their values changed on the data sheets. The reason for the changed values shall be noted on the data sheet. No action is required where no recordable indications exist.

D. If any point on the DAC curve has moved on the sweep line more than ± 2 minor divisions of the sweep division reading, correct the sweep range calibration and note the correction on the calibration data sheet. If recordable reflectors are noted on the data sheets, those data sheets shall be considered invalid. A new calibration shall be established and recorded, and the affected areas re–examined.

E. The use of simulators to verify 8.2.A is allowed if used in accordance with the following:

1) Simulator checks must be correlated with the original calibration block during the original calibration.

2) Simulator check shall be made with the entire system.

3) Simulator used shall be completely identifiable on the Calibration Data Sheet (Figure 1).

NOTE: A simulator may be any one or combination of the following:

1) A suitable reflector from an IIW Block

2) A suitable reflector from a Mini IIW Block

8.3 SCANNING – GENERAL REQUIREMENTS

A. Calibrate the system as described in Section 7 as appropriate.

B. Scanning shall be conducted at the primary reference level +6db minimum except when performing 0° for laminar reflectors. (refer to Para. 7.2B)

C. Locate the weld on the component.

D. Verify that the surface finish on the component is similar to that of the calibration block used to calibrate the system.

E. Establish a search unit scan path that provides 100% code required volume coverage (or maximizes coverage if 100% coverage is not achievable). Refer to Figures 4, 5 and 6 as appropriate, for examination coverage.

F. Each scan shall be overlapped a minimum of 10% of the element dimension.

G. The rate of search unit movement shall not exceed 6 inches per second.

H. Record all indications as required by Section 10.0. If examination volume is free of recordable indications, this shall be noted on the data sheet.

I. Record all obstructions or other conditions that interfered with the examination.

J. Remove couplant from examination surface.

8.4 SCANNING (0°)

A. The base material in the area through which the angle beam will pass shall be 0° scanned prior to the initial angle beam examination. The detection of laminar indications shall be recorded on the Ultrasonic Weld Examination Sheet (Figure 2), and considered when conducting the angle beam scans.

NOTE: This examination is not required if previous data provides the required information.

The Weld Required Volume (WRV) shall examined with a 0° search unit in order to detect planar reflectors (a reflector that lies in a plane which is more than 10° from a plane parallel to the scanning surface of the component). This examination shall be performed on the entire volume of weld and adjacent base material to the extent required in Figures 4 or 5.

8.5 SCANNING (ANGLE BEAM)

8.5.1 Scanning for Reflectors Oriented Parallel to the Weld

1. The angle beam search units shall be aimed at right angles to the weld axis, with the search unit manipulated so that the ultrasonic beams pass through all of the weld metal.

2. The weld shall be completely scanned using two angles in both directions.

3. The adjacent base metal in the examination volume must be completely scanned by two angle beams, e.g. 45° and 60°, but need not be completely scanned by both angle beams from both directions. (Any combination of two angle beams will satisfy the requirements).

4. Where the ultrasonic beams are directed essentially normal to the plane of the weld (parallel to the surface of the material, as when the examination is conducted from the nozzle bore or flange face), beam angles sufficient to provide complete coverage of the weld from one direction shall be acceptable.

5. Record all obstructions or other conditions that interfere with the examination.

8.5.2 Scanning for Reflectors Oriented Transverse to the Weld

1. The angle beam search units shall be aimed parallel to the axis of longitudinal and circumferential welds.

2. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume.

3. Scanning shall be done in two directions 180° to each other to the extent possible, using two different angles.

4. Obstructed areas shall be examined from at least one direction.

9. RECORDING

9.1 PREREQUISITES

A. All indications shall be recorded at reference sensitivity.

B. The determination that an ultrasonic indication is from a flaw or is of geometric or metallurgical origin shall be made by one or more of the following methods:

1) Plot the indication per paragraph 9.3.C.

2) Use of other NDE methods or techniques.

3) Comparison with fabrication drawings or weld preparation drawings.

C. When an indication is required to be recorded, the data required in Figure 3 shall be completed.

D. Terminology used in this procedure:

- Flaw – A residual fabrication or serviced–induced reflector (e.g., slag, crack, etc.)
- Geometric reflector – A weld root, counterbore, weld crown, etc.
- Metallurgical reflector – A weld to base metal interface, grain structure, etc.

9.2 RECORDING CRITERIA FOR INTERFERING LAMINAR REFLECTORS

A. Record all laminar reflectors interfering with angle beam examination by recording all areas giving signal amplitudes equal to or greater than the remaining back reflection.

B. The location, size and depth of the laminar reflector(s) shall be plotted on a sketch. This sketch shall be attached to the Ultrasonic Indication Report Sheet (Figure 3) for use during the angle beam examinations.

9.3 RECORDING CRITERIA FOR GEOMETRIC AND METALLURGICAL REFLECTORS

A. Geometric and metallurgical reflectors shall be recorded at a representative location (maximum amplitude point) when the amplitude equals or exceeds 50% DAC.

B. Previously recorded geometric and metallurgical reflectors shall be verified at the previous recording level and coordinates. Indications need not be re–plotted but shall be referenced on the new data sheet by previous data sheet number and date or by attaching the previous data sheet to the new data package.

C. Plot and verify the indications as follows:

1) Record maximum amplitudes as:

a) a percent of the DAC curve,

b) sweep readings to the reflector,

c) search unit locations and,

d) sound beam direction.

2) Plot location of reflector at a representative position on a full scale cross–section profile drawing showing the source of the indication and all other relative geometric conditions.

9.4 RECORDING CRITERIA FOR NON–GEOMETRIC INDICATIONS

A. 0° and Angle Beam. The length dimension of a recordable indication regardless of its amplitude shall be measured between 50% DAC positions.

B. For determining the through–wall dimension of a recordable indication, measure between points which yield amplitudes of 50% of the maximum amplitude of the indication.

C. Other techniques should be attempted to provide a comparison for establishing the most accurate throughwall dimension.

D. When the ultrasonic signal response(s) being obtained from a reflector is, in the judgment of the examiner, indicative of a crack, the reflector shall be recorded regardless of maximum amplitude obtained.

NOTE: Evaluation of indications shall be performed by personnel with a minimum certification of UT Level II.

9.5 ACCEPTANCE CRITERIA

Acceptance of indications shall be determined by evaluation to the requirements of ASME Boiler and Pressure Vessel Code, Section XI, Article IWA– 3000.

10. EXAMINATION RECORDS

10.1 NES shall be responsible for submitting to the Plant Owner, or his Agent, a complete set of examination records.

10.2 Figure 1 shall be completed by examiner(s) at the time of calibration. Figures 2 and 3 shall be completed by the examiner(s) as required.

10.3 The Examiner(s) shall sign the completed data sheet(s), noting applicable NDE Certification Level(s).

10.4 NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

11. ATTACHMENTS

11.1 FIGURE 1 – Ultrasonic Calibration Data Sheet

11.2 FIGURE 2 – Ultrasonic Weld examination sheet

11.3 FIGURE 3 – Ultrasonic Indication Report Sheet

11.4 FIGURE 4 – Class 1 Examination Volume and Scan path Calculations

11.5 FIGURE 5 – Class 2 Examination Volume and Scan Path Calculations

11.6 FIGURE 6 – Table 1 (Metal Path Calculations)

11.7 FIGURE 7 – Angle beam Verification Block – 2.5 inch presentation

11.8 FIGURE 8 – Angle beam Verification Block – 5.0 inch presentation

11.9 FIGURE 9 – Angle beam Verification Block – 10.0 inch presentation

11.10 FIGURE 10 – Angle beam Verification Block – 20.0 inch presentation

DATA SHEET NO. _____

PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____

REV. _____

CHANGE NO. _____

INSTRUMENT

Model _____

Serial No. _____

Sweep Length _____ Delay _____

Range _____

Gain (coarse) _____ dB

Gain (fine) _____ dB

Reference Sensitivity _____ dB

Remarks: _____

SEARCH UNIT

Serial No. _____

Size _____

Frequency _____ MHz

Mode _____

Nom. Angle _____ °

Measured Angle _____ °

Cable Type _____

Cable Length _____

Remarks: _____

CALIBRATION BLOCK

No. _____

"T" _____ Dia. _____

Temperature _____ ° F

Thermometer S/N _____

CALIBRATION

0° ☐ Axial ☐ Circ. ☐

Metal Path ☐ Depth ☐

Each Major Screen Div. = _____

Remarks _____

COUPLANT

Brand _____

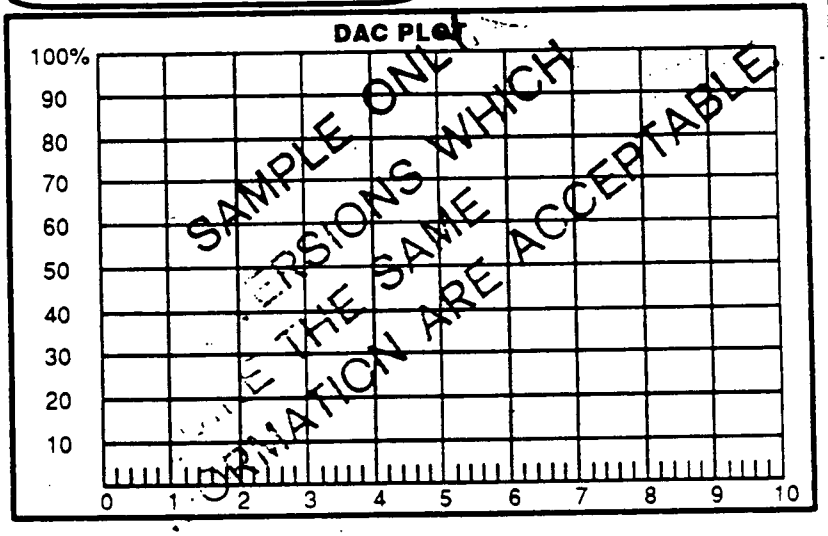
Batch No. _____

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	–6	
80	–12	
40	+6	
20	+12	

CAL. CHECKS	TIME
INITIAL CAL.	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	

REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____

2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____

2 _____ LEVEL _____ DATE _____

3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC CALIBRATION DATA SHEET
FIGURE 1

DATA SHEET NO. ____________
PAGE ______ OF ______
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM ____________
ISO/DWG. NO ______ REV. ______
THERMOMETER S/N ____________
COMPONENT TEMP. ________ ° F

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SAMPLE ONLY,
SIMILAR VERSIONS WHICH
REQUIRE THE SAME
INFORMATION ARE ACCEPTABLE.

EXAMINERS:
1 ______________ LEVEL ______ DATE ______
2 ______________ LEVEL ______ DATE ______

REVIEWERS:
1 ______________ LEVEL ______ DATE ______
2 ______________ LEVEL ______ DATE ______
3 ______________ LEVEL ______ DATE ______

nes NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC EXAMINATION SHEET
FIGURE 2

EXAM ITEM

ISO/DWG. NO.

ULTRASONIC INDICATION REPORT SHEET

- ☐ PIPING WELDS
- ☐ FERRITIC VESSELS ≥ 2" T *
- ☐ OTHER _____

DATA SHEET NO. _____

PAGE _____ OF _____

SAMPLE INDICATION

SEARCH UNIT ANGLE _____° W0 LOCATION _____ L0 LOCATION _____

MP	Metal Path	W max	Distance from W0 to S.U. at maximum response.
RBR	Remaining Back Reflection	W1	Distance from W0 at 50% of DAC (fwd)
L	Distance from Datum	W2	Distance from W0 at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX MP	FWD 50% DAC* W1	FWD MP	BACKWARD 50% DAC* W2	BACKWARD MP	L1 50% DAC	L max	L2 50% DAC	RBR amp	S.U. Loc.	REMARKS

SAMPLE ONLY
REQUIRE THE SAME WHICH
INFORMATION ARE ACCEPTABLE.
VERSIONS

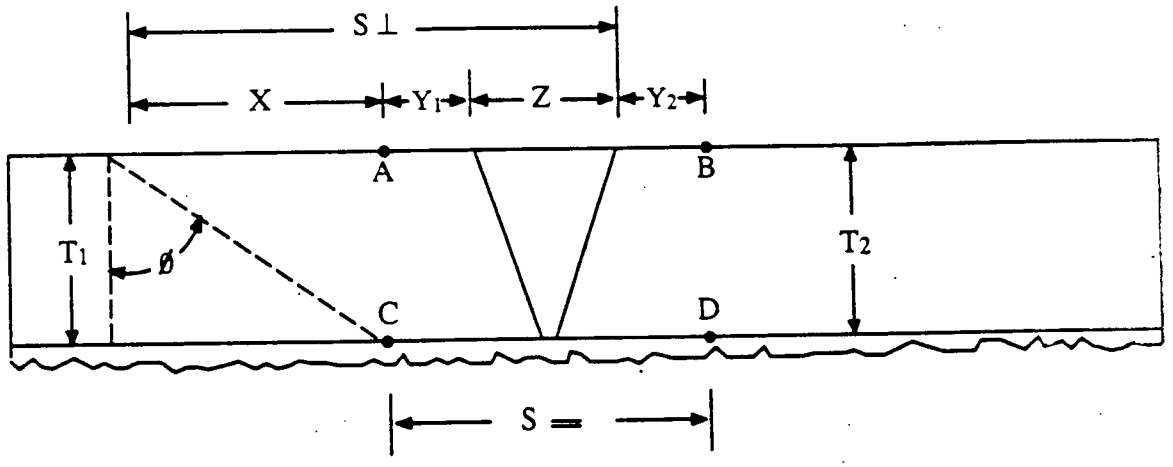
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 _____ LEVEL ____ DATE ____
2 _____ LEVEL ____ DATE ____
REVIEWERS 1 _____ LEVEL ____ DATE ____
2 _____ LEVEL ____ DATE ____
3 _____ LEVEL ____ DATE ____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC INDICATION REPORT SHEET
FIGURE 3

ASME B&PV SECTION XI REQUIRED
EXAMINATION VOLUME CLASS 1 VESSELS
GREATER THAN 2 INCHES



Scan area as required to examine volume A–B–C–D
Scan Path Calculations

Perpendicular Coverage:

S⊥	=	X + Y_1 + Z
X	=	T_1 x Tan 0
Y_1	=	1/2 Material Thickness
Z	=	Width of Weld Crown
0	=	Examination Angle

Example:

T_1	=	2″
0	=	60 degrees
X	=	2″ x Tan 60 = 3.47″
Y_1	=	1
Z	=	1.25
S⊥	=	3.47 + 1 + 1.25 = 5.72″

Drawing shows one sided ⊥ scan only. Weld must be examined from both sides.

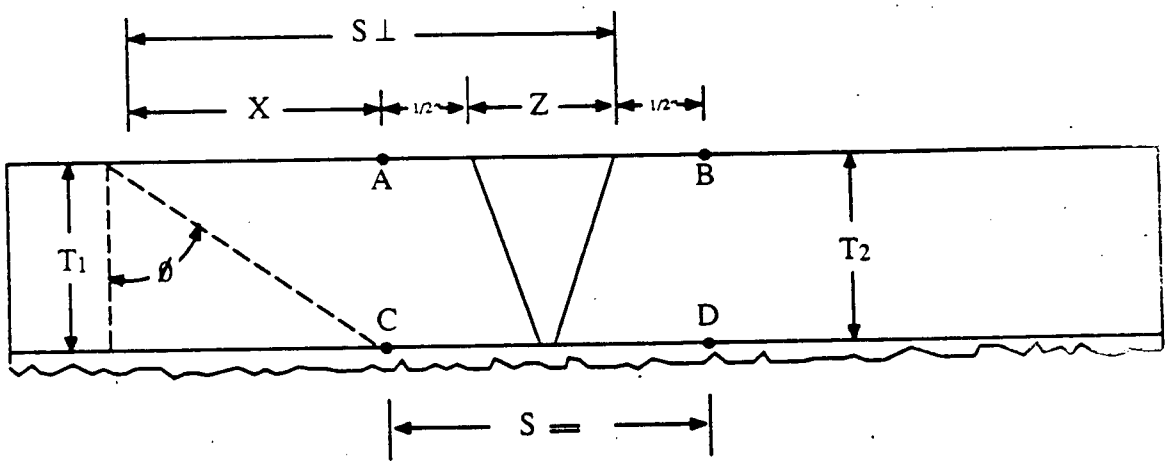
Parallel Coverage:

S═	=	Y_1 + Z + Y_2
Y_1	=	1/2 T_1
Z	=	Width of Weld Crown
Y_2	=	1/2 T_2

For examination volumes not depicted here refer to the referencing code.

EXAMINATION VOLUME CLASS 1 VESSELS
FIGURE 4

ASME B&PV SECTION XI REQUIRED
EXAMINATION VOLUME CLASS 2 VESSELS
GREATER THAN 2 INCHES



Scan area as required to examine volume A–B–C–D
Scan Path Calculations

Perpendicular Coverage:

S⊥ = X + 1/2" + Z
X = T1 x Tan 0
Z = Width of Weld Crown
0 = Examination Angle

Example:
T1 = 2"
0 = 60 degrees
X = 2" x Tan 60 = 3.47"
Z = 1.25
S⊥ = 3.47 + .5" + 1.25" = 5.22"

Drawing shows one sided ⊥ scan only. Weld must be examined from both sides.

Parallel Coverage:

S ═ = 1/2" + Z + 1/2"
Z = Width of Weld Crown

For examination volumes not depicted here refer to the referencing code.

EXAMINATION VOLUME CLASS 2 VESSELS
FIGURE 5

FORMULA FOR DETERMINING METAL PATH

VEE PATH	45°	60°	70°
1/2	T X 1.414	T X 2.0	T X 2.923
3/4	T X 2.121	T X 3.0	T X 4.386
1, 1/2	T X 4.242	T X 6.0	T X 8.769

For determining other metal paths when using other angles, calculate as follows:

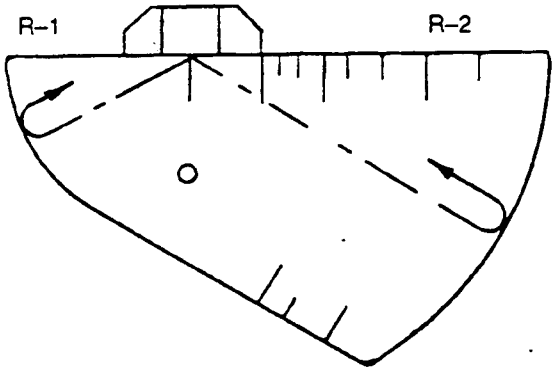
(1) 1/2 Vee — Constant = 1/cos angle

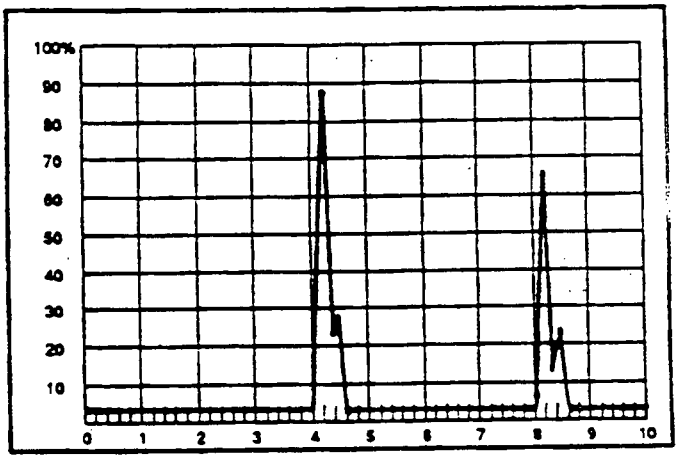
(2) 3/4 Vee — Constant – 1/cos angle x 1.5

(3) 1, 1/2 Vee — Constant – 1/cos angle x 3.0

Constant x "T" = Metal Path for appropriate Vee path.

TABLE 1 (METAL PATH CALCULATION)
FIGURE 6





METAL PATH CALIBRATION FOR A 2.5″ CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block:

1) Maximize the signal from the 1″ radius (R–1).

2) With the Sweep and Delay controls, align this signal at position 4 on the CRT (CRT 4).

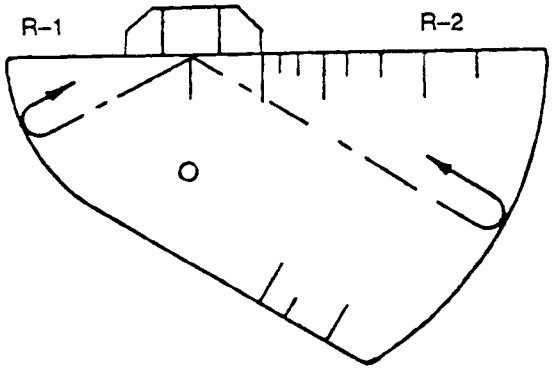
3) Maximize the signal from the 2″ radius (R–2).

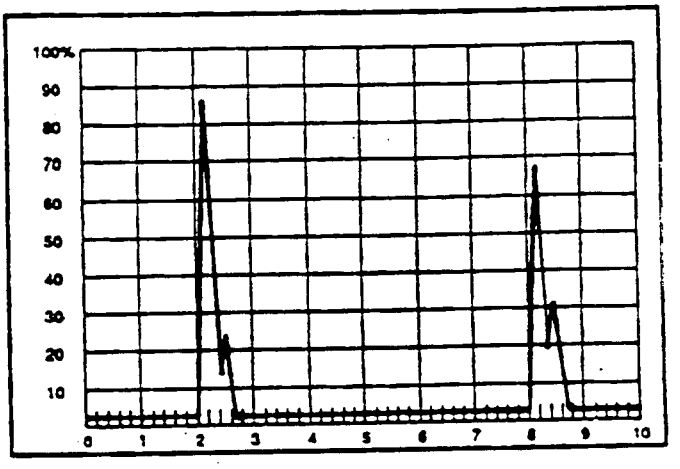
4) With the Sweep and Delay controls, align this signal at CRT position 8.

5) Repeat steps 2 and 4 until the respective signals are aligned at CRT position 4 and CRT position 8.

The instrument is now calibrated for 2.5″ metal path. Each Major Division = 0.25″.

ANGLE BEAM VERIFICATION BLOCK 2.5″ PRESENTATION
FIGURE 7





METAL PATH CALIBRATION FOR A 5″ CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

6) With the transducer facing the 1″ radius, maximize the signals from the 1″ (R–1) and 2″ radius (R–2).

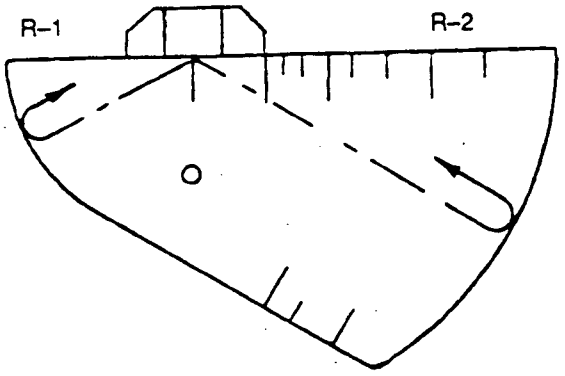
7) With the Sweep and Delay controls, align these signals at positions 2 and 8 respectively.

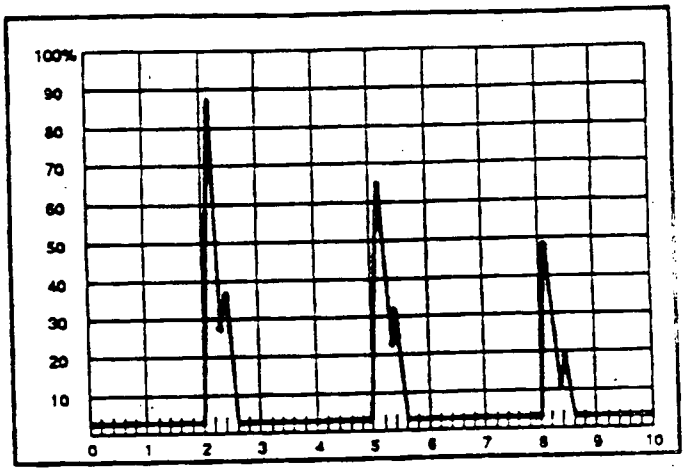
8) Face the transducer at the 2″ radius (R–2), the signal from R–2 should appear at position 4 on the CRT.

The instrument is now calibrated for 5.0″ metal path. Each Major Division = 0.50″.

ANGLE BEAM VERIFICATION BLOCK 5.0″ PRESENTATION

FIGURE 8





METAL PATH CALIBRATION FOR A 10" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

9) With the transducer facing the 2" radius, maximize the signal from the 2" radius (R–2) and align this signal at CRT position 2.

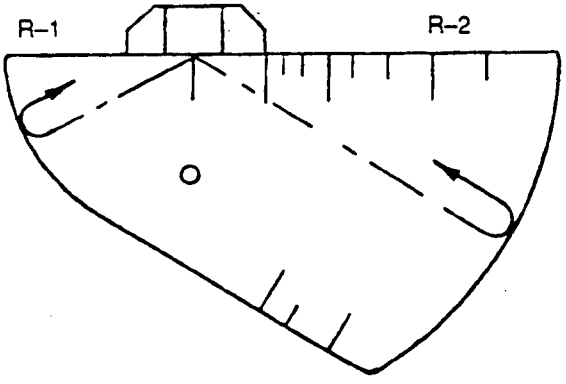
10) Adjust the gain control if necessary and observe the signals that appear from the 5" and 8" metal paths. (These metal pats and signals result from the sound making successive "round trips" from each radius).

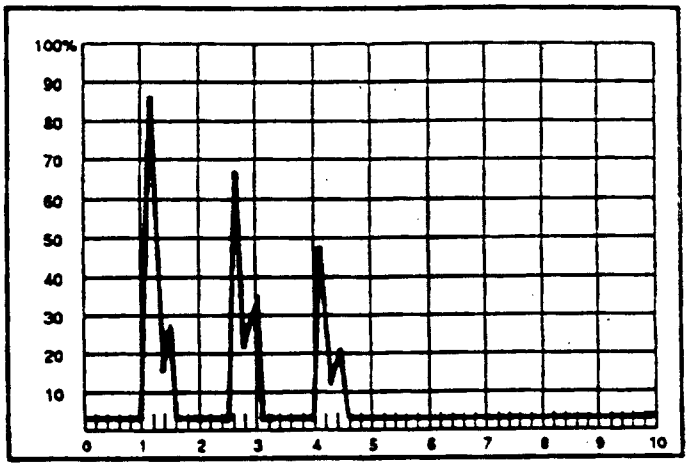
11) With the Sweep and Delay controls, align these signals at CRT positions 5 and 8 respectively.

The instrument is now calibrated for 10.0" metal path. Each Major Division = 1.0".

ANGLE BEAM VERIFICATION BLOCK 10.0" PRESENTATION

FIGURE 9





METAL PATH CALIBRATION FOR A 20″ CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

12) With the transducer facing the 2″ radius, maximize the signal from the 2″ radius (R–2) at CRT position 1.

13) Adjust the gain control if necessary and observe the signals that appear from the 5″ and 8″ metal paths. (These metal pats and signals result from the sound making successive "round trips" from each radius).

14) With the Sweep and Delay controls, align these signals at CRT positions 2.5 and 4 respectively.

The instrument is now calibrated for 20.0″ metal path. Each Major Division = 2.0″.

ANGLE BEAM VERIFICATION BLOCK 20.0″ PRESENTATION

FIGURE 10

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

FOR INFORMATION ONLY

SPECIAL PROCEDURE

SP-1223

ULTRASONIC EXAMINATION OF PIPING SYSTEMS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/17/93

Expiration Date 2/16/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 15 JUL 93
Manager - Technical Support — Date

CONTROLLED RECIPIENT ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 43	0

ULTRASONIC EXAMINATION

OF PIPING SYSTEMS

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

ect Application	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	Level III	Project Mgr.	Director / General Mgr.	
0	Scott Larson				
1	Scott LARSON	Scott Larson 5-14-93	5-17-93	5-17-93	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 85A6011

REV. NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	5/14/93	3,4,	Changes to allow examination of a wider range	Louis J. Sessa for E.C.D. 5-17-93
		10,13	piping with wall thickness and to correct	
		23, 29	typographical error (CRA No. 8635)	

1. PURPOSE

The purpose of this procedure is to define the techniques, recording criteria and equipment for ultrasonic (UT) examination of welds in piping systems.

2. SCOPE

This procedure is limited to manual examinations of piping butt welds in ferritic, austenitic, dissimilar metal and other high alloy steels having a nominal wall thickness within the range of 0.2 inches to 6.0 inches which are examined from the outer surface of the pipe (OD). The examination techniques described herein comply with references 3.1 which specify techniques for detection of fabrication and service induced flaws including stress corrosion cracking. This procedure meets the requirements of the referenced documents to the extent specified in this procedure. Weld thickness outside the range of 0.2 inches to 6.0 inches is within the scope of this procedure provided the technique is adequately demonstrated to the satisfaction of the Authorized Nuclear Inservice Inspection and Plant Owner.

3. REFERENCES

3.1 ASME Boiler & Pressure Vessel Code, Section XI Appendix III 1986 Edition.

3.2 80A9068 – NES Procedure for Certifying Nondestructive Examination Personnel.

3.3 80A9053 – NES Procedure for Ultrasonic Instrument Linearity Verification.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with references 3.1 and 3.2.

4.2 It is recommended that the examination crews comprise at least two members. At least one member of each examination crew shall have a minimum certification of UT Level II. Evaluations shall be conducted by an examiner with a minimum certification of UT Level II.

4.3 A copy of each examiner's certification summary and current eye test shall be maintained on site.

4.4 A copy of each examiner's certification summary and current eye test shall be made available to the plant owner or his agent prior to performing examinations per this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT

A. A pulse echo ultrasonic flaw detection instrument with the following requirements:

1. A current acceptable linearity in accordance with Ref.3.3
2. Operates within the minimum frequency ranges of 1.0 MHz to 5.0 MHz
3. Equipped with a stepped gain control calibrated in units of 2 dB or less.

B. The following models of ultrasonic flaw detection equipment manufactured by Krautkramer Branson are acceptable for use:

USK–7
USL–40 series
USL–30 series
USK–6

5.2 SEARCH UNITS

Search units may contain either a single or dual transducer elements. Units with contoured wedges may be used. Search unit type used (e.g., dual element, contoured wedge, etc.) shall be documented on the applicable Calibration and Examination Data Sheet (Exhibit 1 and Exhibit 2).

A. Search Unit Size

The maximum nominal search unit dimension for circular, square or rectangular elements shall not exceed those listed in Table 5.2–1. Search units other than those sizes allowed in Table 5.2–1, shall require procedure change.

TABLE 5.2-1

Maximum Allowable Transducer Size

Pipe Wall Thickness (Nominal)	Transducer Size (diameter or square)
Less than 0.5 in.	1/4 in.
0.5 to 2.0 in.	1/2 in.
over 2.0 in.	1 in.

NOTE: For dual element search units used, the dimension applies to one of the two elements.

B. Search Unit Frequency

1. Shear Wave. 2.25 MHz is the recommended frequency. Other frequencies may be used if necessary to improve signal to noise ratio or resolution.

2. Longitudinal Wave 0°. 5 MHz is the recommended frequency. Other frequencies may be used if necessary to improve signal to noise ratio.

3. Longitudinal Wave Angle Beam (RL). 2.25 MHz is the recommended frequency. Other frequencies may be used if necessary to improve signal to noise ratio or resolution.

NOTE: All beam angles used during the examination shall be verified by actual measurement.

C. Search Unit Beam Angle.

1. In ferritic material, a beam angle of 45° ± 2° shall be used. Other angles may be used where wall thickness or geometric configuration impedes effective use of a 45° search unit.

2. In austenitic and dissimilar metal welds where the actual beam angle in the examination component may change, the measured angle in the component at the ID surface shall be 40° or greater for shear wave, and 35° or greater for R L (see paragraph 7.3).

NOTE: **Where circumferential scanning is required, ensure that the angle of the sound beam that is incident on the ID surface of the pipe is within the range of usable angles shown in the chart below.**

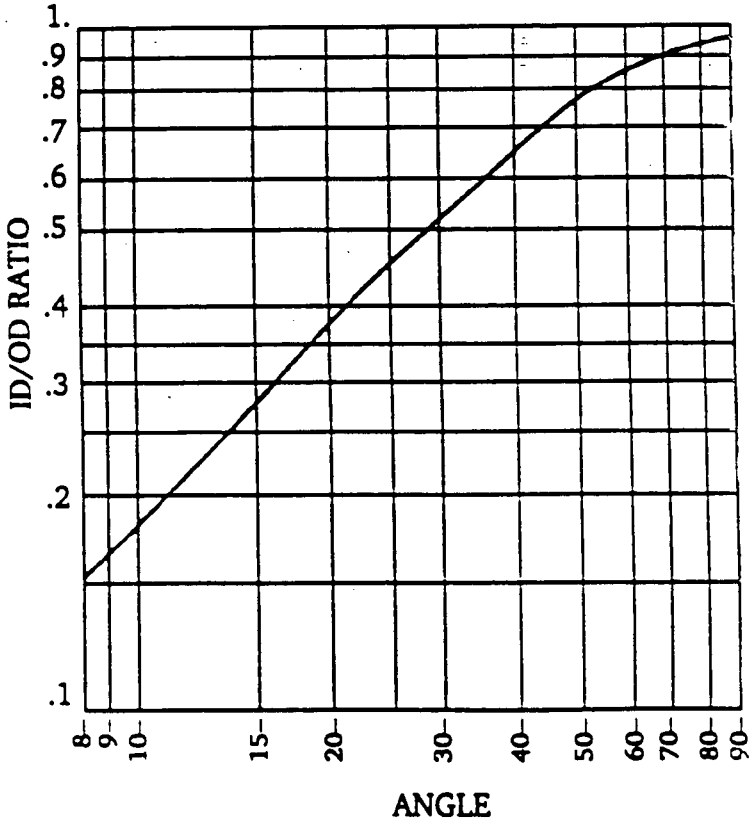
The minimum refracted angle for a given ID/OD ratio can be determined as follows:

1. Calculate the ID/OD ratio:

$$\frac{ID}{OD} = \text{Ratio}$$

2. For the given ratio move horizontally across the figure to a point that intersects the curve. Then move vertically downward and note the maximum usable angle.

MAXIMUM USABLE REFRACTED ANGLE (DEGREES)



5.3 CABLE

Cables shall have appropriate connectors and may be any convenient length. Examinations shall be conducted using the same cable as that used during the calibration. The number of connectors shall be documented with the cable type on the Ultrasonic Calibration Data Sheet (Exhibit 1).

5.4 COUPLANT

Ultragel – or couplant supplied by the Plant Owner.

5.5 CALIBRATION BLOCK(S)

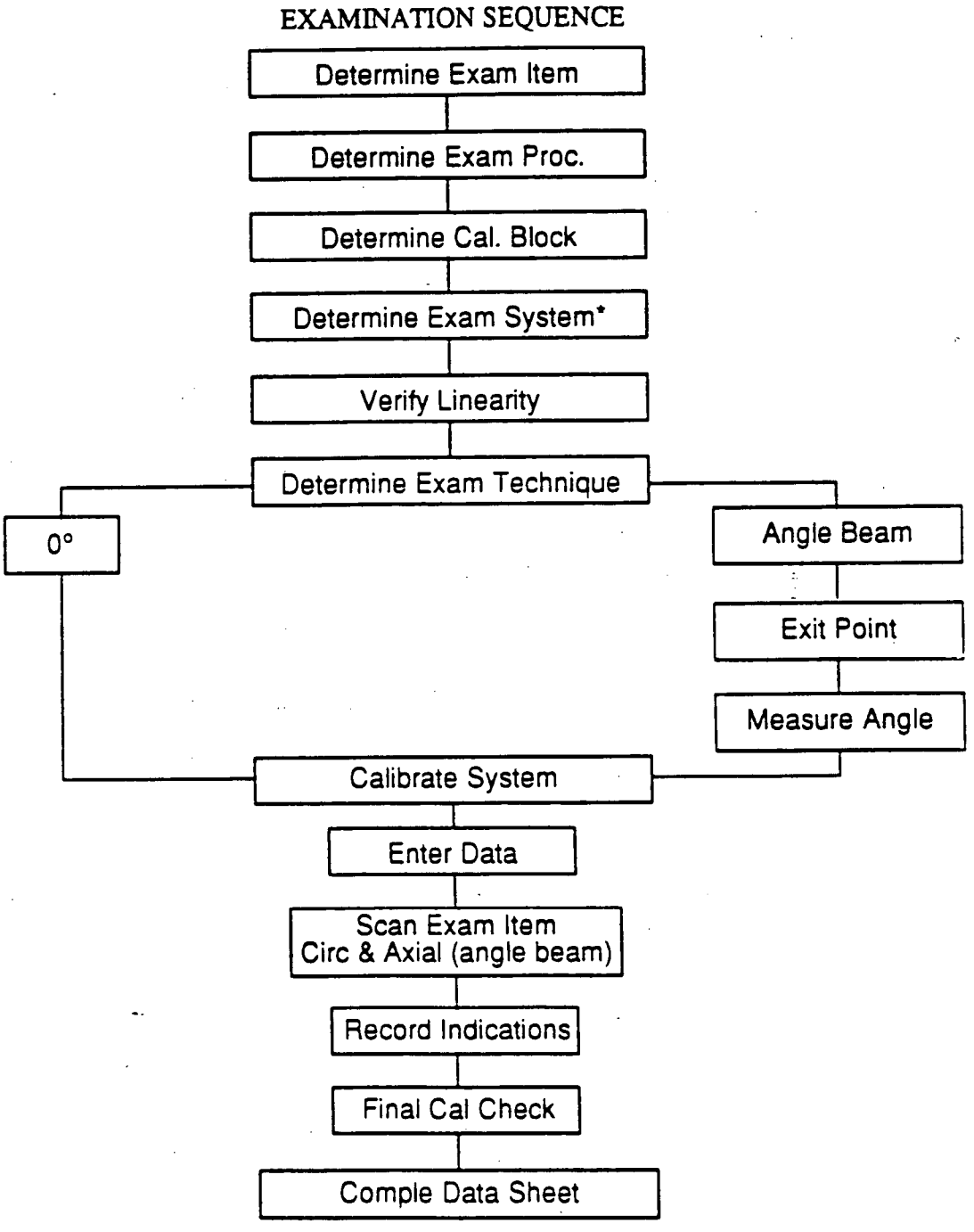
A. Calibration blocks shall be selected and provided by the Plant Owner and shall as a minimum, contain reflectors that enable calibration as required in Section 7 of this procedure.

B. IIW CALIBRATION STANDARDS

These may be either full size or miniature IIW standards and shall be fabricated from either Stainless or Carbon Steel. Selection for use shall depend upon the material to be examined.

6. GENERAL PREREQUISITES

The following flow chart describes a typical examination sequence:



*System = Instrument, Transducer, Wedges, and Cable.

6.1 The components to be examined shall be identified/determined by the Plant Owner.

6.2 Calibration Blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the plant owner, e.g., the examination surface shall be free of foreign matter which may interfere with ultrasonic transmission.

6.4 Each weld to be examined shall be identified by the Plant Owner with reference points sufficient to locate the search unit along the weld seam.

NOTE: **The examiner shall notify the NES "lead individual" or other designated contact individual when surface preparation of scanning surfaces and identification of reference points are not suitable for ultrasonic examination.**

6.5 Previous examination data provided by the Plant Owner shall be reviewed by the examiner and the following items should be identified:

A. 0° information for interfering conditions

B. Weld configuration

C. Obstructions

D. Circumferential Scan Data

E. Recordable indications

F. Previous examination technique

G. Previously measured angle in the component

H. Use the preceding information/data to make a determination (prior to starting examination) of the extent of coverage of the examination volume and limitations (if any), and the best examination technique(s) to apply.

6.6 Examination technique shall be established (e.g. 1/2 Vee, 3/4 Vee, 1-1/2 Vee etc.) depending on component geometry.

A. The required angle beam method of examination for axial scans is the 3/4 Vee technique. However, weld configuration, scan path obstructions, material attenuation, material thickness, search unit type or site specific requirements, may require different methods and calibrations to obtain the required coverage.

B. Variables such as weld configuration, weld crown width or physical interference may prevent obtaining the required coverage of the examination volume with 3/4 Vee examination from two sides. These types of interference may be eliminated by one or more of the following:

1. Increasing the beam path as required. (beam paths greater than 3/4 Vee in austenitic material require written approval by the UT Level III); 1

2. Reducing the dimension of the wedge edge–to–beam entry point;

3. Reducing search unit size;

4. Increasing beam angle;

5. Conditioning the weld surface.

C. Circumferential scan. For welds in Carbon Steel, only those welds showing reportable Preservice Inspection (PSI) transverse indications need be examined for transverse reflectors. The examination technique shall be 1/2 Vee (see 7.5.3).

6.7 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows: 1

A. Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

B. Screen height and amplitude control linearities should be performed daily (when in use).

6.8 The calibration block surface temperature shall be within 25°F of the component to be examined.

7. CALIBRATION PROCEDURE

7.1 PREREQUISITES

A. If the calibration block does not contain the reflectors required to perform the calibration techniques identified in this section, or is otherwise incorrect for the items to be examined, the Plant Owner shall be notified and the examination not performed.

B. Calibration shall be performed from the OD surface (clad or unclad) of the calibration block which corresponds to the component surface to be scanned.

C. The calibration shall be performed using the same transducers, wedges and cables (length and number of connectors) that are to be used during the examination.

D. Dual Search Units

NOTE: Dual search units shall be used as directed by the supervisor or the L III UT examiner.

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1. When using dual angle beam search units, (shear or longitudinal wave), component thickness and focal distance shall be compatible. Compatibility is determined by a signal to noise ratio of at least 10:1 when scanning the ID notch in the component calibration block. Where this is not achievable, the site supervisor shall be notified and may authorize performance of the examination as appropriate.

2. Half Vee techniques only shall be used.

E. Transducer Exit Point

The transducer sound beam exit point shall be marked on the wedge.

The exit point to wedge front edge dimension shall be measured and recorded in the Search Unit Remarks section on the Ultrasonic Calibration Data Sheet. Record as: Exit Point to Wedge Front Edge: _____".

F. Maximum response from the calibration reflector shall be obtained with the sound beam essentially perpendicular to the axis of the calibration reflector. The centerline of the search unit shall be at least 3/4" from the nearest side of the calibration block. Directing the beam into a corner formed by the reflector and the side of the block may produce a higher amplitude signal at a longer beam path; this beam path shall not be used for calibration.

G. Where it is noted that the Distance Amplitude Correction (DAC) curve appears to plot below 20% Full Screen Height (FSH), a double DAC shall be established (see paragraph 7.6).

H. Determination of beam angle (see Paragraph 7.2)

NOTE: **For Stainless Steel examinations, unless this information already exists (previous data), the beam angles shall be determined in the component at least once for each pipe size, schedule and material to be examined. This is to identify beam angle changes in the component which may result in misinterpretation of examination results. Where this determination is necessary, steps A, through D, of paragraph 7.3 shall be followed.**

7.2 DETERMINATION OF BEAM ANGLE

The beam angle shall be determined as follows:

A. Carbon Steel:

The beam angle shall be determined using a Carbon Steel IIW Calibration Block (standard or mini).

B. Stainless Steel:

1. Refracted Longitudinal. The beam angle shall be determined by triangulation, using the reflectors in the appropriate piping calibration block.

2. Shear. The refracted angle shall be determined by following the instructions in Paragraph 7.3

7.3 METHOD FOR DETERMINING SHEAR WAVE BEAM ANGLE IN COMPONENTS

NOTE: Where material wall thickness or geometry prevents the use of the following method, other methods may be used with the approval of the UT Level III.

A. Use two search units representing the nominal examination angle. (± 2°) with verified exit points.

B. With a 0° search unit, measure the thickness of the area through which the angle beam will pass during the examination (calibration documentation not required).

C. In the axial direction, couple the two angle beam search units in a "pitch–catch" arrangement.

D. Maximize the signal and record the actual distance between the exit points of the two search units.

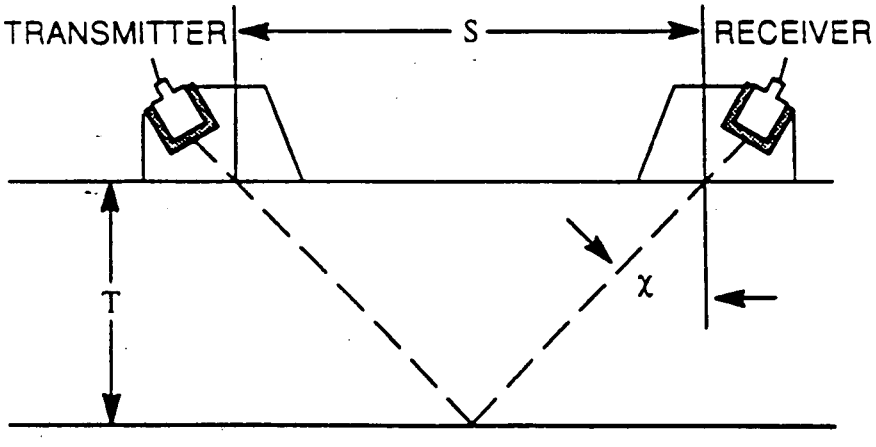
E. Using the formula below, calculate the actual (in the material) beam angles:

$$\frac{S}{2T} = \text{TAN}(\chi)$$

E.g., S = 2″
T = 1″
Then $\frac{2}{2 \times 1} = 1$

INV. TAN 1 = 45°

S = Skip distance
T = Thickness (actual)
χ = Actual beam angle



BEAM ANGLE VERIFICATION

7.4 0° CALIBRATION FOR BASE MATERIAL (When required).

0° calibration for the detection of interfering conditions (laminar inclusions) shall be performed on the component in conjunction with the examination.

A. The sweep setting shall be established such that two back reflections from the component appear on the CRT screen during the 0° scanning.

NOTE: It is recommended that a linear screen (calibrated in metal path) be used, in the event that indication recording becomes necessary.

B. With the search unit placed on the component, the sensitivity level of the first back reflection shall be set at 80% FSH.

C. Increase the gain by +6dB. This sensitivity level shall be maintained while scanning the component. (Observe second back reflection amplitude.)

7.5 ANGLE BEAM CALIBRATION

NOTE: The angle beam technique described in Paragraph 7.5 (3/4 Vee technique) establishes an alternative examination method which provides enhancement to the ASME Section XI Code specified 1/2 Vee examination technique (Article III-3230 (d)).

A. Verify the search unit sound beam exit point using a standard IIW or miniature IIW block.

B. Determine the beam angle (see Paragraph 7.2 or 7.3)

7.5.1 Contoured wedges.

a. For contoured wedges without an identified exit point, determine the exit point by passing the edge of a steel scale (or any suitable edge) along the curved area

of the wedge and marking the location on the wedge where the maximum amplitude response occurs.

b. The beam angle shall be determined by triangulation using the reflectors in the piping calibration block.

c. Sweep calibration shall be accomplished by using the measured metal path from reflectors in the appropriate piping calibration block.

7.5.2 Transducer Perpendicular to Weld

a. Shear Wave Angle Beam Calibration 3/4 Vee Technique

1. Establish sweep calibration. For recommended metal paths see Exhibits 5 thru 10.

NOTE: **In all cases, the examiner should avoid using a sweep calibration that uses only a small portion of the screen.**

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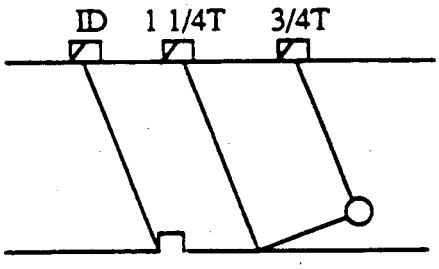
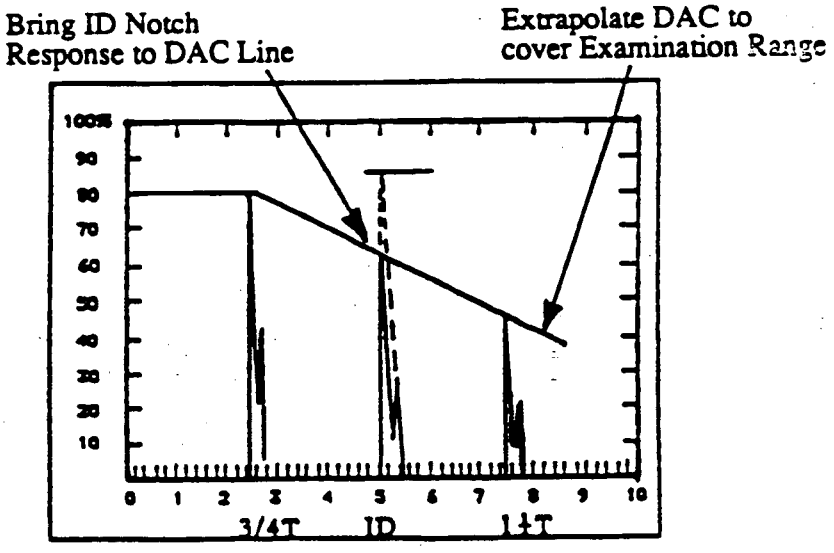
2. The shape and slope of the DAC curve is established by obtaining maximized responses from the 3/4 T and 1-1/4 T holes. The 1/2 T and 1-1/2 T holes may be substituted where the 3/4 T and 1-1/4 T holes do not exist.

3. Set the signal amplitude from the hole producing the highest amplitude to 80% FSH and mark its amplitude and position on the CRT screen. Without changing sensitivity, maximize the signal from the remaining hole and mark its amplitude and position on the CRT. Note signal response amplitudes and position on the Ultrasonic Calibration Data Sheet (Exhibit 1.).

4. Plot a DAC curve by connecting the locations (marked on the CRT) with a continuous line. Extrapolate the DAC curve to include the inner 1/3 thickness and extend the DAC line horizontally to the left of the first calibration signal position as shown below.





3/4 VEE CALIBRATION

5. Obtain a maximized response from the ID notch and adjust the instrument sensitivity to bring its peak to the DAC line. This is "REFERENCE SENSITIVITY". On the Ultrasonic Calibration Data Sheet (Exhibit 1.) note the change in sensitivity required to bring its peak to the DAC line.

6. Upon completion of calibration, ensure that all data and instrument settings are recorded on the Ultrasonic Calibration Data Sheet (Exhibit 1).

b. Shear Wave Angle Beam Calibration: Full Vee and 1–1/2 Vee Techniques.

1. Establish sweep calibration. For recommended metal paths see Exhibits 5 thru 10.

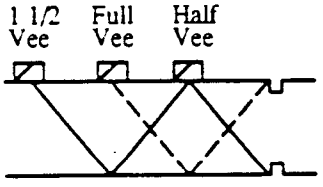
2. Obtain maximized signal responses from the notches in the calibration block and mark the signal response positions on the CRT.

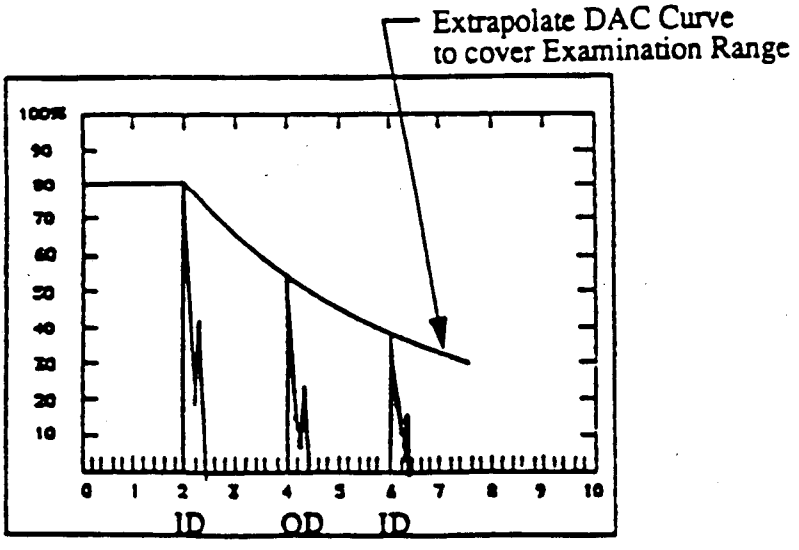
3. Maximize the signal from the notch that produces the highest response and set its amplitude to 80% FSH.

4. Without changing sensitivity settings, maximize the remaining notch signal response(s) and mark the peak amplitudes on the CRT and on the Ultrasonic Calibration Data Sheet (Exhibit 1).

5. Plot a DAC curve by connecting the locations (marked on the CRT) with a continuous line extended to cover the full examination range. This is "REFERENCE SENSITIVITY".

6. Upon completion of calibration, ensure that all the data and instrument settings are recorded on the Ultrasonic Calibration Data Sheet (Exhibit 1).





1 1/2 VEE CALIBRATION

c. 1/2 VEE CALIBRATION

1. Establish sweep calibration. For recommended metal paths see Exhibits 5 thru 10.

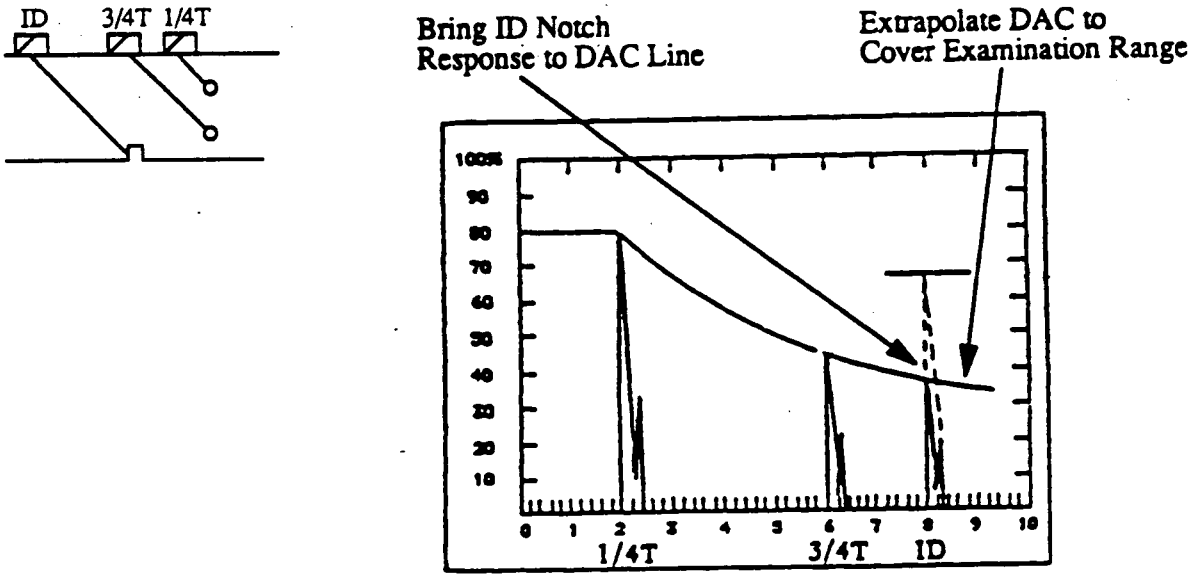
2. The shape and slope of the DAC curve is established by obtaining responses from the 1/4 T and 3/4 T holes.

3. Set the signal amplitude from the hole which provides the highest response to 80% FSH and mark its amplitude and position on the CRT screen. Without changing sensitivity, maximize the signal from the remaining hole and mark the amplitude at the appropriate position on the CRT. Note signal responses and amplitudes on the Ultrasonic Calibration Data Sheet (Exhibit 1).

4. Plot a DAC curve by connecting the locations (marked on the CRT) with a continuous line extended to include the full examination range.

5. Obtain a maximized signal from the ID notch and adjust the instrument sensitivity to bring the top of the signal to the DAC line. This is "REFERENCE SENSITIVITY". Note the change in sensitivity required to bring the ID notch response to the DAC line, on the Ultrasonic Calibration Data Sheet Exhibit 1).

6. Upon completion of calibration, ensure that all data and instrument settings have been recorded on the Ultrasonic Calibration Data Sheet (Exhibit 1).



1/2 VEE CALIBRATION

7.5.3 Transducer Parallel to the Weld.

Shear wave angle beam calibration for reflectors transverse to the weld shall be established by setting the ID notch at 80% of FSH. The DAC curve in this case shall be a straight line drawn at 80% .

7.6 DOUBLE DAC

Factors such as high attenuation, transducer frequency or transducer size, may cause the slope of the DAC to fall below 20% FSH within the calibration area of the CRT. If this condition is still apparent after changing the size and/or frequency of the transducer, the following correction shall be made:

A. Note the point where the DAC curve drops below the 20% FSH line.

B. Mark this point on the CRT and increase the gain by +6dB.

C. Mark the new location of the side drilled hole that previously appeared below the 20% line.

D. Return to the previous reflector that was originally above 20% and mark its new amplitude on the CRT. (see note below)

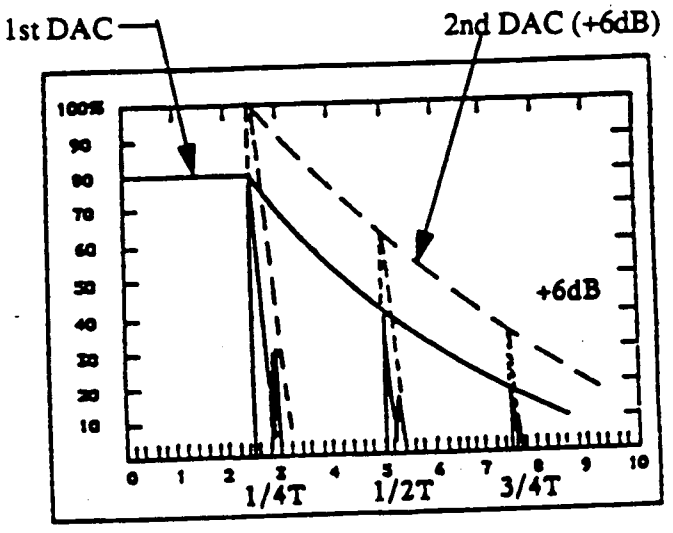
E. Connect the new points established in 7.6.C and 7.6.D to establish the second DAC curve

F. Extend the curve if necessary to include the examination area

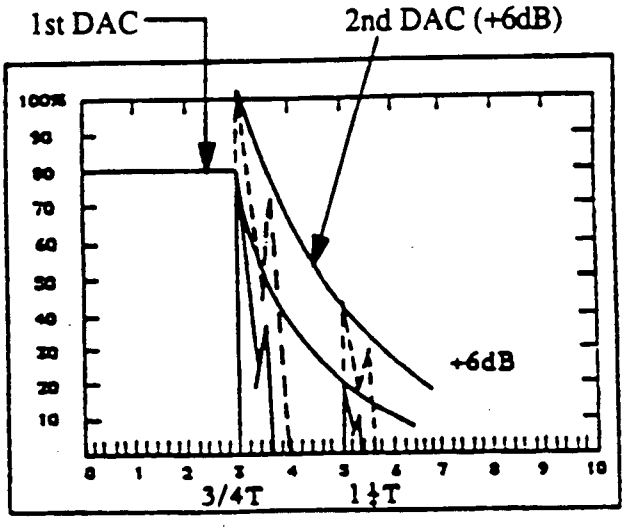
G. Record the new positions and settings on the Ultrasonic Calibration Data Sheet (Exhibit 1).

NOTE: **Where the amplitude of the reflector referenced in "D" above increases to a level that exceeds FSH, set this signal amplitude at 100% FSH and create the second DAC using the signal from this reflector as the starting point and the signal from the next reflector as the second point on the DAC. Connect the two points. This is now the second DAC. Record data as in "G" above.**

DOUBLE DAC



Example 1



Example 2

8. EXAMINATION PROCEDURE

8.1 PREREQUISITES

NOTE: "SYSTEM" = Instrument, Transducer, Wedge(s) and Cable.

8.1.1 System Calibration

Perform the complete ultrasonic examination system calibration, establishing the DAC curve, within one day prior to use of the system for examination of those welds for which the calibration is applicable, and at least once each week during the examination, or at any time that any part of the system is changed.

8.1.2 System Check

a. Verify the system calibration (instrument sensitivity, and sweep range calibration) at the following intervals:

1. At the start and finish of examinations for which the examination applies.
2. At intervals not to exceed 12 hours. (Recommended – 4 hour intervals.)
3. With every change of examination personnel.
4. With any change of batteries
5. If the examiner suspects any malfunction of the UT system.

b. If any point of the DAC curve has decreased 20% or 2dB in amplitude, all data sheets since the last calibration shall be considered invalid. A new calibration shall be made and recorded and the affected examination areas reexamined.

c. If any point of the DAC has increased more than 20% or 2 dB in amplitude, recorded indications taken since the last valid calibration shall be

reexamined with the correct calibration and their values changed on the data sheets. The reason for the changed values shall be noted on the Ultrasonic Calibration Data Sheet. No action is required where no recordable indications exist.

d. If any point on the DAC curve has moved more than 2 minor divisions of the sweep division reading, correct the sweep range calibration and note the correction on the Ultrasonic Calibration Data Sheet. If recordable reflectors are noted on the data sheets, those data sheets shall be considered invalid. A new calibration shall be established and recorded and the affected areas reexamined.

8.2 SCANNING FOR REFLECTORS PARALLEL TO THE WELD

NOTE: The 1-1/2 Vee calibration shall be used in carbon steel only, and only if access to the weld and required volume (WRV) is limited to one side, unless approved in writing by the UT Level III.

A. Calibrate the system as described in Section 7.5 as appropriate.

B. Locate the weld in the piping system. (If the weld number is not physically marked on the pipe, verification of identification of the adjacent components e.g. a valve etc, should be made).

C. Verify that the surface finish on the component is similar to that of the calibration block used to calibrate the system and that examination zone coverage will be to the extent identified in the pre-examination preparations.

D. Establish a search unit scan path that provides 100% WRV coverage (or maximized coverage if 100% coverage is not achievable). See Exhibit 4 and 5 for examination coverage and formula for determining metal path.

E. Scanning shall be conducted at reference sensitivity level + 6dB minimum. For IGSCC examinations, scanning sensitivity should be a minimum of 10 dB above

reference, where the material grain structure allows. When using focused R L search units, noise from grain structure may prevent a meaningful examination (see Paragraph 7.1.D.1). In this case scanning may be conducted at reference sensitivity.

F. Scan the weld and WRV from both sides with the search unit oriented perpendicular toward the weld. (If 1–1/2 Vee technique is required, scan from one side only). Each scan shall be overlapped a minimum of 10% of the element dimension.

G. The search unit shall be swiveled at least 20° each side of normal, to maximize examination effectiveness. Where this is not possible, the scan shall be overlapped by 50% of maximum beam intensity (– 6dB) points) as determined on the calibration block –OR– 50% of a single element dimension.

H. The rate of search unit movement shall not exceed 6 inches per second. (3 inches per second for IGSCC detection).

I. Record all indications as required by Section 9. If the WRV is free of recordable indications, this shall be noted on the Ultrasonic Examination Data Sheet (Exhibit 2)

J. Record all obstructions or other conditions that interfered with the examination. Include sufficient dimensions from datum zero so that a determination/calculations subsequently can be made of the volume not covered, or which received limited examination coverage.

K. Remove couplant from the examination surface.

8.3 SCANNING FOR REFLECTORS TRANSVERSE TO THE WELD

REMINDER: **For welds in carbon steel, only those welds showing reportable PSI transverse indications need be examined for transverse reflectors.**

A. Calibrate the system as described in paragraph 7.5.3

B. Locate the weld in the piping system (if the weld number is not physically marked on the pipe, verification of identification of adjacent components e.g. a valve etc., should be made).

C. Scanning Sensitivity:

1. Scanning shall be conducted at the primary reference level + 6dB minimum.

2. For IGSCC examinations, scanning sensitivity should be a minimum of 10 dB above reference, if the material grain structure allows.

3. When using focused R L search units, noise from grain structure may prevent a meaningful examination (see Paragraph 7.1.D.1). In this case scanning may be conducted at reference sensitivity.

D. For welds in **ferritic material**, scan the weld crown in two directions with the search unit oriented parallel to the weld. If the examination is a baseline (PSI or new replaced piping), examine the weld and a minimum of 1/2" on both sides of the weld in two directions.

E. For PSI and ISI of **austenitic and dissimilar metal** welds, scan the weld and a minimum of 1/2" on either side of the weld in two directions.

F. The search unit shall be swiveled at least 20° each side of normal, to maximize wxamination effectiveness. Where this is not possible, the scan shall be overlapped by 50% of maximum beam intensity (– 6dB) points) as determined on the calibration block –OR– 50% of a single element dimension.

G. Record all indications as required by Section 9. If the WRV is free of recordable indications, this shall be noted on the Ultrasonic Examination Data Sheet (Exhibit 2) .

H. Note all obstructions or other conditions that interfered with the examinations on the Ultrasonic Examination Data Sheet (Exhibit 2). Include sufficient dimensions from datum zero so that a determination/calculations subsequently can be made of the volume not covered, or which received limited examination coverage.

I. Remove couplant from examination surface.

9. RECORDING

9.1 PREREQUISITES

A. Except as provided in 9.3.D, indications shall be recorded at reference sensitivity.

B. When using "Double DAC" examination, indication(s) shall be recorded at the appropriate sensitivity pertaining to the specific DAC used at the time of the detection of the indication(s).

C. Previously recorded geometry shall be verified at the previous recording level (% of DAC) and coordinates. Indications need not be re–plotted, but shall be referenced on the new data sheet by previous data sheet number and date, or by attaching a copy of the previous data sheet to the new data package.

D. The determination that indications are of geometric or metallurgical origin shall be made by one or more of the following methods:

1. Plot and verify the indications as follows:
   a. Record maximum amplitudes as a percent of the DAC curve, sweep readings to the reflector, search unit locations and sound beam direction.
   b. Plot location of the reflector at a representative position on a full scale cross section profile drawing, showing the source of the indication and all other relative geometric conditions.
2. Use of other NDE methods or techniques.
3. Comparison with fabrication drawings of weld preparation drawings.
4. Review of original radiographs.

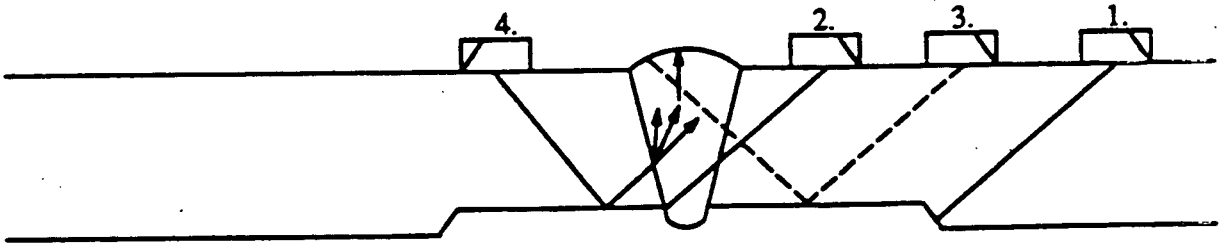
9.2 RECORDING CRITERIA FOR GEOMETRIC INDICATIONS

NOTE: **Geometric reflectors that exist may be due to weld configuration or metallurgical conditions (e.g. beam redirection due to dendritic grain structure in stainless steel welding). Geometric indications can also occur from a water level interface in a pipe. Examples of the above are shown in the sketches below. Such indications need not be characterized as flaws or compared with the allowable flaw standards (e.g. ASME Section XI IWA–3000).**

A. For PSI or new replaced piping, indications with amplitudes 20% of DAC or greater, shall be recorded.

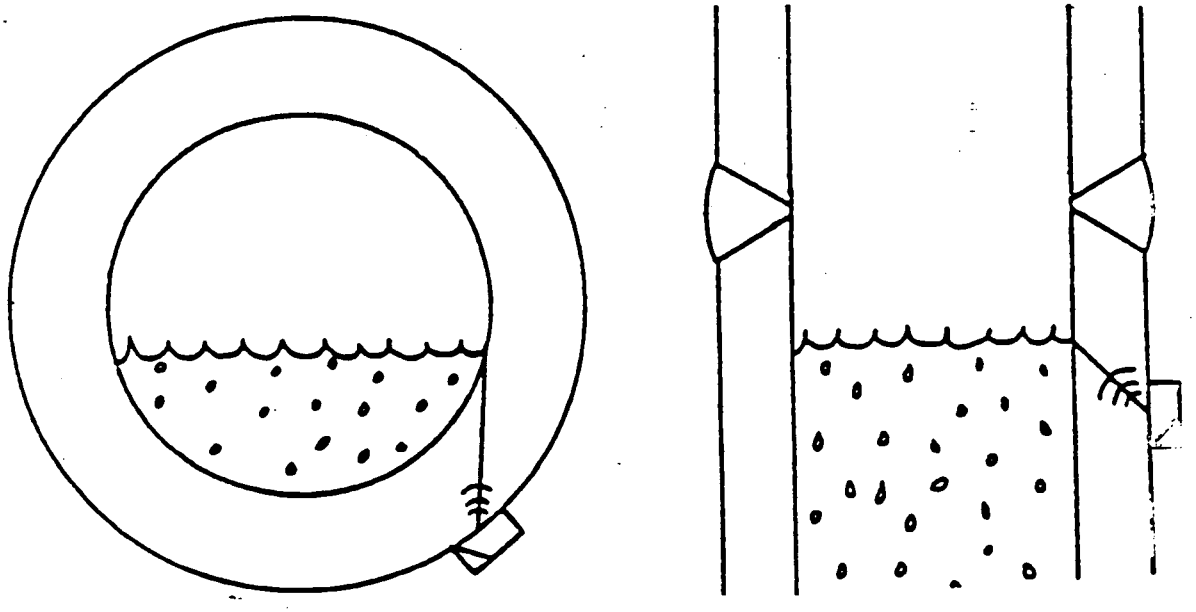
B. For ISI (inservice inspection) where geometry has not been previously recorded (as referenced in 9.1.C), indications that have amplitudes 50% DAC or greater shall be recorded.

C. For each geometric indication, the information required on the Ultrasonic Indication Report Sheet (Exhibit 3) shall be provided, including a cross sectional plot showing OD profile and geometry in the indication area.



EXAMPLES OF GEOMETRIC INDICATIONS

1. Counterbore
2. Weld Root
3. Weld Crown
4. Beam Redirection



GEOMETRIC INDICATION FROM WATER IN PIPE

9.2.1 Method of Recording Geometric Indications:

Record the maximum amplitude, location, and extent of a geometric indication.

For example: Counterbore, 80% DAC maximum amplitude, 1 inch from the weld root, and from 90 degrees to 180 degrees.

– or –

100% maximum amplitude at weld root, intermittent, 360 degrees.

9.3 RECORDING CRITERIA FOR NON–GEOMETRIC INDICATIONS

A. Any indication suspected to result from cracking, shall be recorded regardless of amplitude.

B. Indications which are determined to be non–service induced (e.g. welding induced flaws) and are not of geometric or metallurgical origin shall be recorded if they meet or exceed the following:

1. Ferritic material – 50% DAC

2. Stainless Steel – 20% DAC

C. For each non–geometric indication, the information required on the Ultrasonic Indication Report Sheet (Exhibit 3) shall be provided, including a cross sectional plot showing OD profile and ID geometry in the area of the indication(s).

D. If a suspected non–geometric indication (as in A above) is not detectable at reference level, it shall be recorded at scanning sensitivity level. 1

E. The examiner shall provide any additional information that will aid in dispositioning the indications.

9.4 ACCEPTANCE CRITERIA

Acceptance of indications shall be determined by the requirements of ASME Section XI, IWA–3000, or other referencing code sections as applicable.

10. EXAMINATION RECORDS

A. NES shall be responsible for submitting to the Plant Owner or his Agent, a complete set of examination records.

B. Exhibit 1 shall be completed by examiners to the extent possible, at the time of the calibration. Where the sheet cannot be completed at the time of the calibration, the sheet shall be completed promptly after the last examination that uses that calibration.

C. Exhibits 2 and 3 shall be completed by the examiners as required.

D. The examiner(s) shall sign the completed data sheet, noting applicable NDE Certification level(s).

E. NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

11. ATTACHMENTS

11.1 Exhibit 1 – Ultrasonic Calibration Data Sheet

11.2 Exhibit 2 – Ultrasonic Examination Data Sheet

11.3 Exhibit 3 – Ultrasonic Indication Report Sheet

11.4 Exhibit 4 – Required Examination Volume

11.5 Exhibit 5 – Table 1 (Metal Path Calculation)

11.6 Exhibit 6 – Angle Beam Verification Block 1.0" presentation

11.7 Exhibit 7 – Angle Beam Verification Block 2.5" presentation

11.8 Exhibit 8 – Angle Beam Verification Block 5.0" presentation

11.9 Exhibit 9 – Angle Beam Verification Block 10.0" presentation

11.10 Exhibit 10 Angle Beam Verification Block 20.0" presentation

DATA SHEET NO. _____
PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____
REV. _____
CHANGE NO. _____

INSTRUMENT
Model _____
Serial No. _____
Sweep Length _____ Delay _____
Range _____
Gain (coarse) _____ dB
Gain (fine) _____ dB
Reference Sensitivity _____ dB
Remarks: _____

SEARCH UNIT
Serial No. _____
Size _____
Frequency _____ MHz
Mode _____
Nom. Angle _____ °
Measured Angle _____ °
Cable Type _____
Cable Length _____
Remarks: _____

CALIBRATION BLOCK
No. _____
"T" _____ Dia. _____
Temperature _____ ° F
Thermometer S/N _____

CALIBRATION
0° ☐ Axial ☐ Circ. ☐
Metal Path ☐ Depth ☐
Each Major Screen Div. = _____
Remarks _____

COUPLANT
Brand _____
Batch No. _____

VERTICAL LINEARITY
AMPLITUDE % FSH

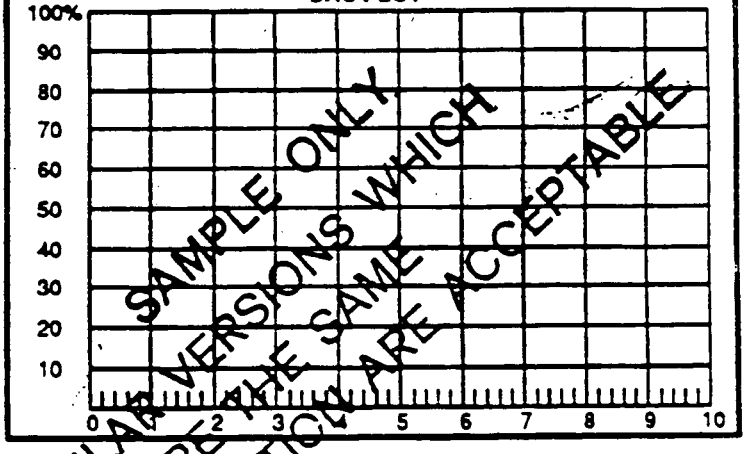
	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	
80	-12	
40	+6	
20	+12	

CAL CHECKS	TIME
INITIAL CAL	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL	

DAC PLOT



REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC CALIBRATION DATA SHEET
EXHIBIT 1

DATA SHEET NO.__________
PAGE _____ OF _____
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM__________
ISO/DWG. NO.______ REV._____
THERMOMETER S/N__________
COMPONENT TEMP.______ °F

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

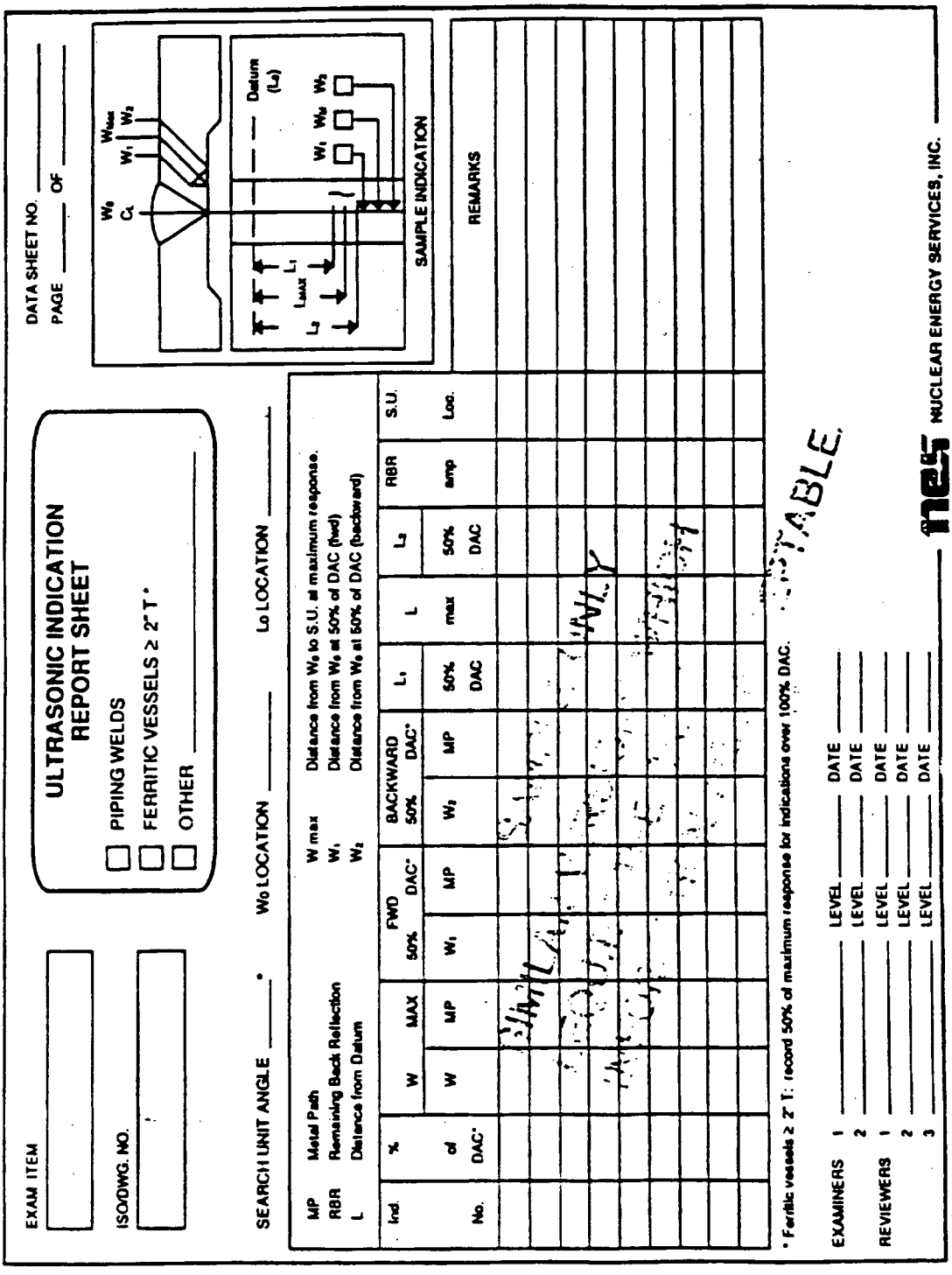
SAMPLE ONLY, SIMILAR VERSIONS WHICH REQUIRE THE SAME INFORMATION ARE ACCEPTABLE.

EXAMINERS:
1 __________ LEVEL_____ DATE _____
2 __________ LEVEL_____ DATE _____

REVIEWERS:
1 __________ LEVEL_____ DATE _____
2 __________ LEVEL_____ DATE _____
3 __________ LEVEL_____ DATE _____

nes NUCLEAR ENERGY SERVICES, INC.

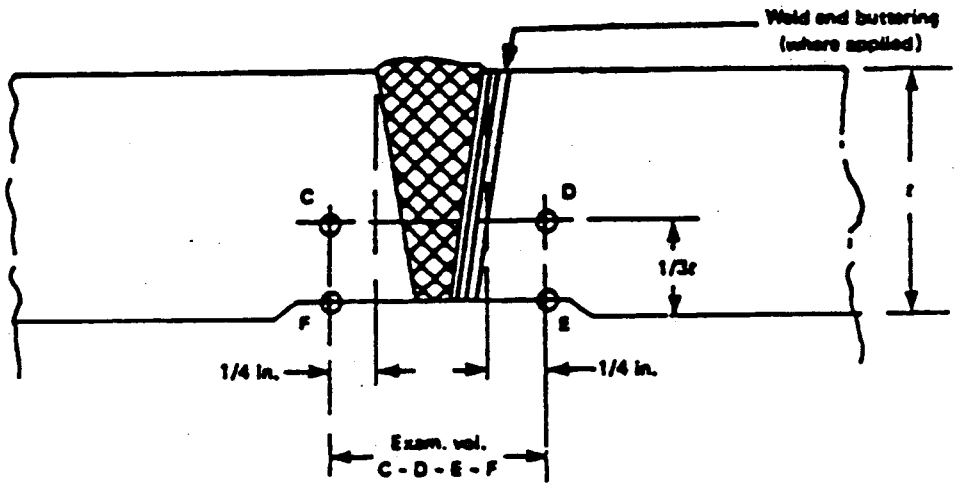
ULTRASONIC EXAMINATION SHEET
EXHIBIT 2



ULTRASONIC INDICATION REPORT SHEET

EXHIBIT 3

FORM #NES 205 7/90



ASME SECTION XI WELD EXAMINATION VOLUME

NOTE: For Non ASME Section XI Examinations – See Referencing Code for Appropriate Examination Volume.

REQUIRED EXAMINATION VOLUME

EXHIBIT 4

FORMULA FOR DETERMINING METAL PATH

45 2"
60 2.5

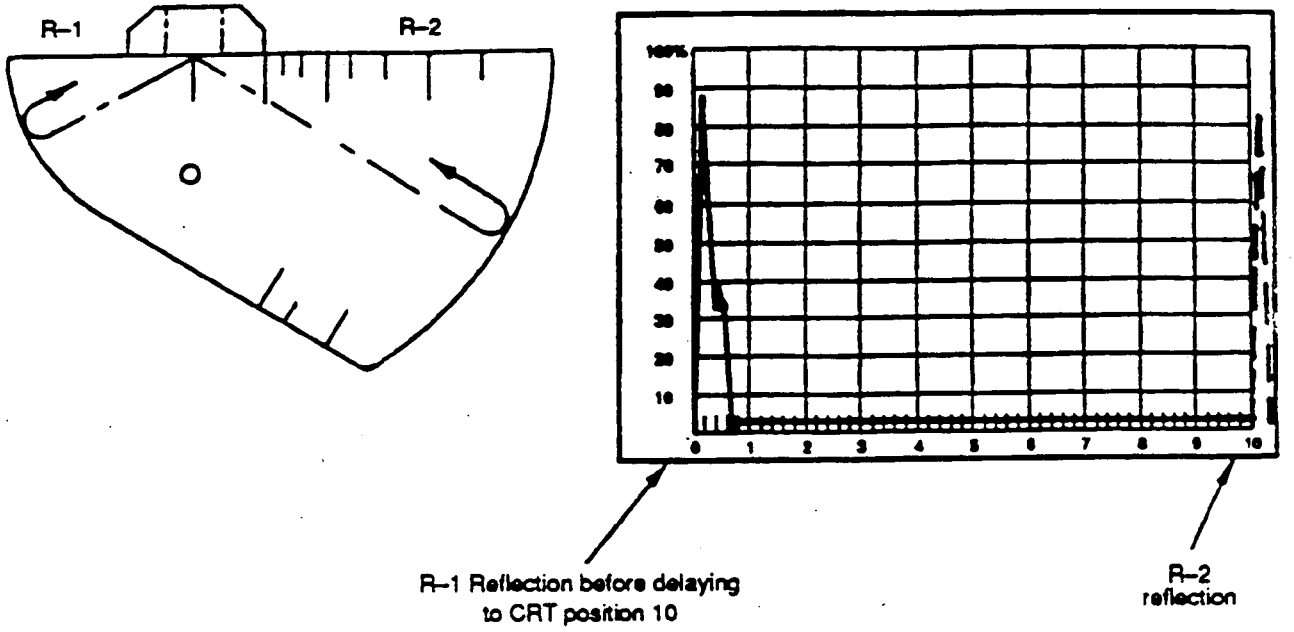
VEE PATH	45°	60°	70°
1/2	T X 1.414	T X 2.0	T X 2.923
3/4	T X 2.121	T X 3.0	T X 4.386
1, 1/2	T X 4.242	T X 6.0	T X 8.769

For determining other metal paths when using other angles, calculate as follows:

(1)	1/2 Vee	Constant = 1/cos angle
(2)	3/4 Vee	Constant – 1/cos angle x 1.5
(3)	1, 1/2 Vee	Constant – 1/cos angle x 3.0

Constant x "T" = Metal Path for appropriate Vee path.

TABLE 1 (METAL PATH CALCULATION)
EXHIBIT 5



METAL PATH CALIBRATION FOR A 1" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block:

1) Maximize the signal from the 1" radius (R–1).

2) With the Sweep and Delay controls, align this signal at position 10 on the CRT (CRT 10).

3) With the Delay control, move this signal to CRT 0.

4) Maximize the signal from the 2" radius (R–2).

5) With the Sweep control, align this signal at CRT 10.

6) Repeat steps 1 thru 5 until the respective signals are aligned at CRT 0 and CRT 10.

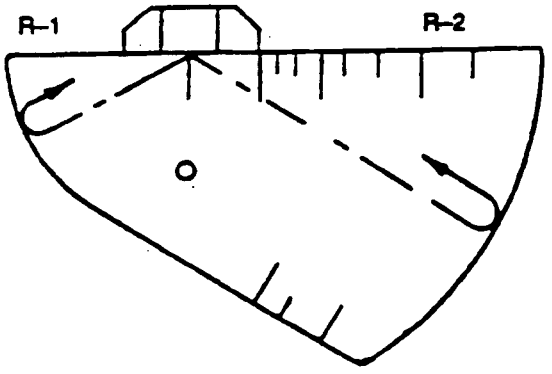
7) With the Delay control only, move the R–1 signal across the screen to position CRT 10.

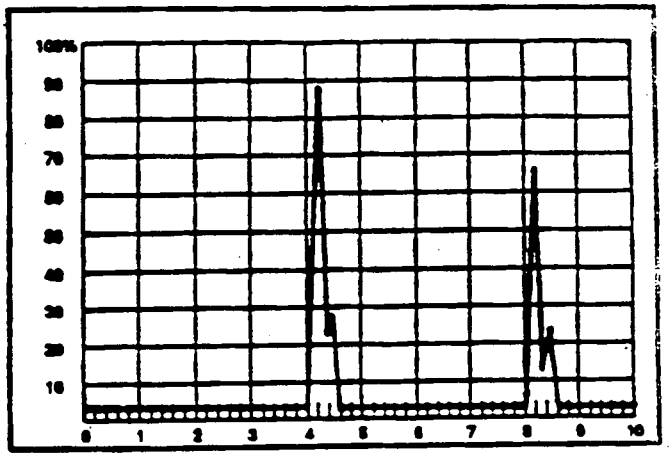
8) Make no further adjustments to sweep or delay controls.

The instrument is now calibrated for 1" metal path. Each Major Division = 0.10".

ANGLE BEAM VERIFICATION BLOCK 1.0" PRESENTATION

EXHIBIT 6





METAL PATH CALIBRATION FOR A 2.5" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block:

1) Maximize the signal from the 1" radius (R–1).

2) With the Sweep and Delay controls, align this signal at position 4 on the CRT (CRT 4).

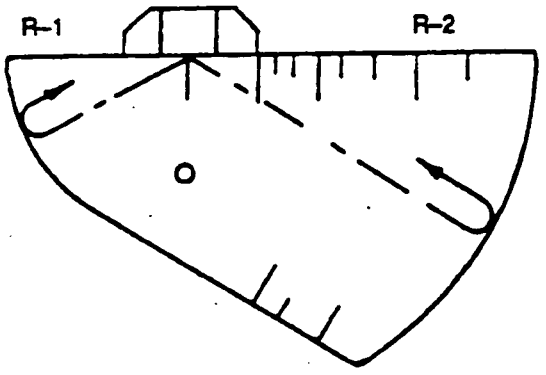
4) Maximize the signal from the 2" radius (R–2).

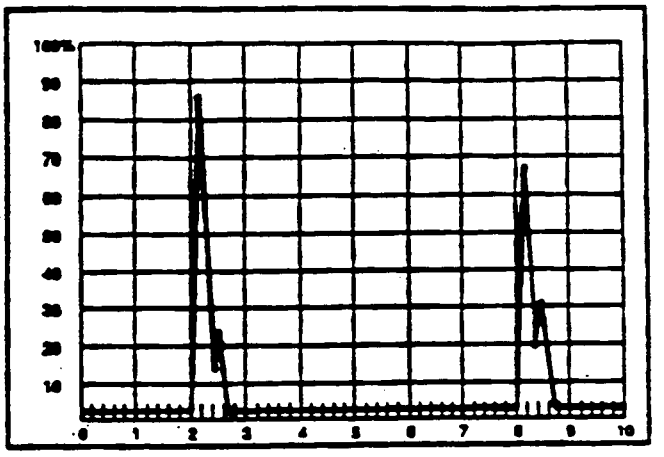
5) With the Sweep and Delay control, align this signal at CRT position 8.

6) Repeat steps 2 thru 4 until the respective signals are aligned at CRT position 4 and CRT position 8.

The instrument is now calibrated for 2.5" metal path. Each Major Division = 0.25".

ANGLE BEAM VERIFICATION BLOCK 2.5" PRESENTATION
EXHIBIT 7





METAL PATH CALIBRATION FOR A 5" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

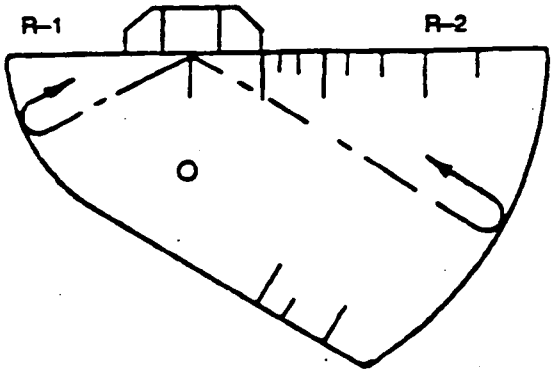
1) With the transducer facing the 1" radius, maximize the signals from the 1" (R–1) and 2" radius (R–2).

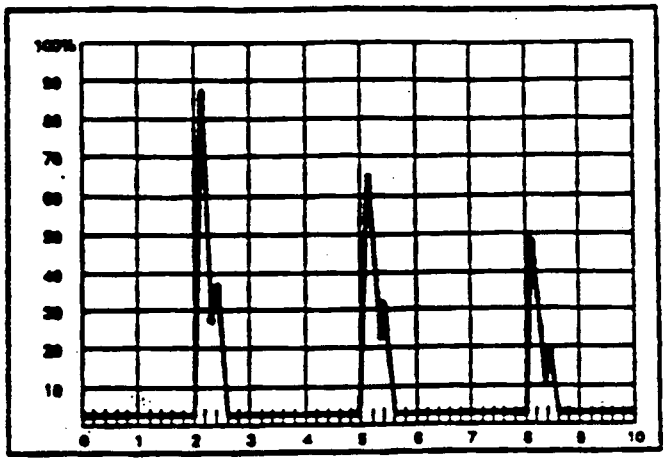
2) With the Sweep and Delay controls, align these signals at positions 2 and 8 respectively.

3) Face the transducer at the 2" radius (R–2), the signal from R–2 should appear at position 4 on the CRT.

The instrument is now calibrated for 5.0" metal path. Each Major Division = 0.50".

ANGLE BEAM VERIFICATION BLOCK 5.0" PRESENTATION
EXHIBIT 8





METAL PATH CALIBRATION FOR A 10" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

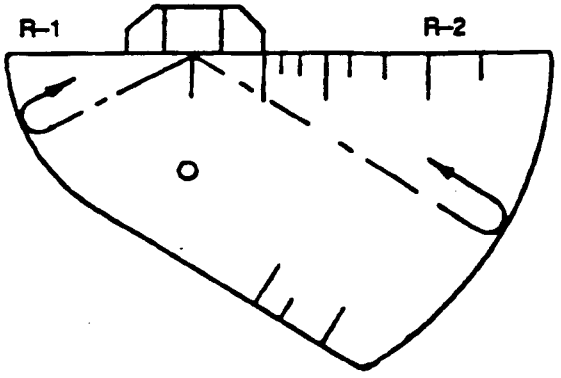
1) With the transducer facing the 2" radius, maximize the signals from the 2" (R–2) and align this signal at CRT position 2.

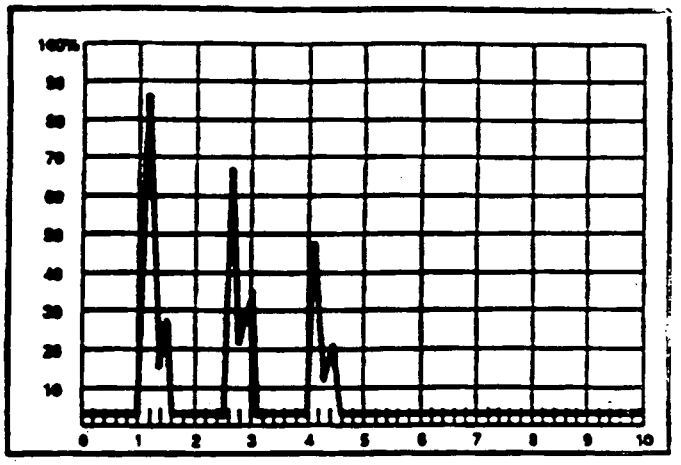
2) Adjust the gain control if necessary and observe the signals that appear from the 5" and 8" metal paths. (These metal paths and signals result from the sound making successive "round trips" from each radius).

3) With the Sweep and Delay controls, align these signals at CRT positions 5 and 8 respectively.

The instrument is now calibrated for 10.0" metal path. Each Major Division = 1.0".

ANGLE BEAM VERIFICATION BLOCK 1.0" PRESENTATION
EXHIBIT 9





METAL PATH CALIBRATION FOR A 20" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

1) With the transducer facing the 2" radius, maximize the signals from the 2" radius (R–2) at CRT position 1.

2) Adjust the gain control if necessary and observe the signals that appear from the 5" and 8" metal paths. (These metal paths and signals result from the sound making successive "round trips" from each radius).

3) With the Sweep and Delay controls, align these signals at CRT positions 2.5 and 4 respectively.

The instrument is now calibrated for 10.0" metal path. Each Major Division = 2.0".

ANGLE BEAM VERIFICATION BLOCK 2.0" PRESENTATION
EXHIBIT 10

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1224

ULTRASONIC SIZING OF PLANAR FLAWS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8|10|93

Expiration Date 2|10|94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 24AUG93
Manager - Technical Support — Date

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 53	0

ULTRASONIC SIZING OF PLANAR FLAWS

FOR

H. B. ROBINSON NUCLEAR PROJECT

Project Application	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	UT LIII	Project Manager	Director JSI	
0	Scott Larson				
1	Scott Larson	Scott Larson 6-8-93	6-9-93	6-9-93	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

Page 3 of 53

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6071

PAGE 2 OF 50

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	6/7/93	4,6,7	Extensive revision per CRA No. 8646	Scott Larson 6-8-93
		16,17		

ULTRASONIC SIZING OF PLANAR FLAWS

1. PURPOSE

The purpose of this document is to provide guidelines for manual Ultrasonic techniques to be used when measuring the depth of planar flaws originating at the inside surface of a component.

2. SCOPE

The techniques described herein are applicable to Carbon and Austenitic Stainless Steel including thicknesses between 0.2 and 2.0 inches. The techniques are applicable to full penetration butt welds and adjacent material including the measurement of Intergranular Stress Corrosion Cracking (IGSCC).

3. REFERENCES

3.1. Coordination Plan for NRC/EPRI/BWROG Training and Qualification Activities of NDE Personnel

3.2. ASME Boiler and Pressure Vessel Code Section XI 1986 edition

3.3. ASME Code Case N-409 (Dec. 5, 1984) Procedure and Personnel Qualification for Ultrasonic Detection and Sizing of IGSCC in Austenitic Piping Welds.

3.4. UT Operator Training for Sizing of IGSCC - EPRI

3.5. NES Procedure for Certifying Nondestructive Examination Personnel - 80A9068

3.6. NES Procedure for Ultrasonic instrument Linearity Verification - 80A9053

NOTE: This procedure meets the requirements of the referenced documents to the extent specified in this procedure.

4. PERSONNEL REQUIREMENTS

4.1. Personnel conducting ultrasonic sizing in accordance with this procedure shall be qualified and certified to the requirements as referenced in Ref.3.1, 3.3 and 3.5 above.

NOTE: Reference 3.1 and 3.3 applies only for examinations where detection of IGSCC is conducted.

4.2. A copy of each examiner's certification summary and current eye test shall be maintained on site.

4.3. A copy of each examiner's certification summary and current eye test shall be made available to the plant owner of his agent prior to performing work per this procedure.

4.4. Personnel performing sizing by this procedure shall have received training on the application of the particular techniques included in this procedure.

5. GENERAL DEFINITIONS

5.1. ACRONYMS LISTING

AATT	Absolute Arrival Time Technique
CE–1	Collateral Echo #1
CE–2	Collateral Echo #2
CRT	Cathode Ray Tube.
CR–LW	Creeping Longitudinal Wave
CS	Carbon Steel
d	Flaw Depth from Component ID
DAC	Distance Amplitude Curve
FSH	Full Screen Height
ID	Inside Diameter
IGSCC	Intergranular Stress Corrosion Cracking
IP	Initial Pulse
LW	Longitudinal Wave
MOST	Multipulse Observation Sizing Technique
ρ – Rho	MOST Technique – measurement of first pulse signal arrival time
σ – Sigma	MOST Technique – measurement of flaw height – related separation
τ – Tau	MOST Technique – measurement of arrival–time difference

PATT	Pulse Arrival Time Technique
RATT	Relative Arrival Time Technique
RW	Remaining Wall Thickness
SDC	Screen Division Reading for Corner Signal
SDF	Screen Division Factor
SDT	Screen Division Reading for Flaw Tip
SPOT	Satellite Pulse Observation Technique
SS	Stainless Steel
SW	Shear Wave
TOF	Time of Flight

5.2. GENERAL DEFINITIONS

CREEPING WAVE (OD)	A portion of the wave-front that is generated by a high angle LW Search Unit and travels at approximately the velocity of the LW component along the OD surface.
CREEPING WAVE (ID)	A mode converted portion of the SW that is produced on the ID surface of the component as the SW strikes the ID at a specific angle and travels at approximately the velocity of a LW along the ID surface.
DOUBLET	Two signals displayed on the CRT screen simultaneously. One signal is the reflection from the flaw opening at the surface, while the other is the diffracted wave front from the tip of the flaw.
ECHO DYNAMICS	The behavior of the signal on the CRT screen as the sound beam is applied to a reflector while simultaneously moving the transducer.
EXAMINATION AREA	The area containing previously detected reflectors
FOCAL DEPTH	The area in the material where the sound beam is most effective. With dual Search Units this is the region where the beam from both elements would theoretically converge. This region is dependent on the angle and design of the Search Unit.
SYSTEM	Instrument, Search Unit(s) and Cable(s)

S/N RATIO	Signal to Noise Ratio. The ratio of the amplitude of a desired signal at any point, to the amplitude of the noise signals at that same point.
TIME OF FLIGHT	The measured time between the transmittal and reception of a pulse of ultrasonic energy. Also the time measured between the arrival of specific wave-fronts (pulses).
WEDGE NOISE	Signals that are produced from reflections within the Search Unit wedge. These may appear in the area of interest and can hinder interpretation.

6. EQUIPMENT AND MATERIAL REQUIREMENTS

6.1. ULTRASONIC INSTRUMENT

A Pulse Echo flaw detection instrument that:

a) Is linear as required by Ref. 3.6

b) Operates within the frequency ranges of 1.0 MHz to 5.0 MHz.

c) Is equipped with a stepped gain control calibrated in units of 2 dB or less

6.2. SEARCH UNITS

6.2.1. Search Units may be either single element or dual element, producing longitudinal (LW) and/or shear waves (SW) in the test component material. Wedges may be modified (e.g contoured) to suite a particular configuration. Modifications shall be described on the Sizing Data Report to the extent that would permit duplication of the modification at a later date/examination.

6.2.2. The recommended frequency range is nominally 1.0 MHz to 5.0 MHz., or as dictated by the specific technique.

6.2.3. Beam angles produced should be 30° and greater, as required by the specific application.

6.2.4. The following is a recommended Search Unit inventory for use when conducting sizing techniques:

a) 70° 5.0MHz Dual LW/OD Creeping Wave

b) 70° 2.25MHz Dual LW/OD Creeping Wave

c) WSY 70–2

d) WSY 70–4

e) ADEPT 60 or equivalent

f) Other transducers as required

6.2.5. For each angle beam search unit used to record sizing data, measure and record the dimension from the wedge exit point to the front edge.

6.3. CABLES

6.3.1. Cables shall have appropriate connectors and may be any convenient length. Sizing shall be performed using the same cable as that used during calibration.

6.4. COUPLANT

6.4.1. Ultragel or comparable client approved couplant.

6.5. CALIBRATION BLOCK(S)

6.5.1. Standard calibration blocks such as the IIW, miniature angle beam, step wedges and special sizing reference blocks fabricated from Carbon or Stainless steel pertinent to the material being examined, as well as other sizing reference blocks required by any specific technique.

7. GENERAL PREREQUISITES

NOTE 1: Areas/reflectors to be sized shall be identified by previous detection techniques.

NOTE 2: Requirements noted in this section may be modified by individual sizing methods or techniques. Where this occurs, the requirement of the individual method or technique shall govern.

7.1. SURFACE CONDITIONS

a) The surface from which the examination is to be conducted should be free from any foreign matter that may interfere with ultrasonic transmission.

b) The surface finish should be essentially flat in the axial direction to allow for maximum "line contact" of the Search Unit. For sizing on contoured surfaces, contoured wedges are desirable. When in doubt, a UT Level III should be consulted. Surface conditioning may be requested where necessary.

c) Certain sizing techniques may require the reduction / removal of the weld crown to allow for search unit movement. This area should include the entire length of the flaw.

7.2. TEMPERATURE

The calibration block temperature shall be within 25° of the temperature of the component to be examined.

7.3. CALIBRATION

NOTE 1: The CRT RF signal "rise" point or maximum (peak) may be used for the various techniques in this procedure. The technician should feel comfortable with the selected option. Both options are randomly used in this procedure

NOTE 2: It is permitted to perform and size with more than one calibration at a time. The technician shall record sweep and delay control readings of each calibration on individual calibration sheet and a copy of the master calibration sheet shall be used at the work area during sizing.

a) Calibrations may be stored in the instruments "memory" when using equipment with this capability. The specific calibration(s) shall be documented on the Sizing Data Report (See Exhibit 1).

b) Specific calibration requirements for each sizing technique included in this procedure are to be found with the specific technique, however the following are general prerequisites for calibration.

7.3.1. Calibration Verification

Calibration shall be verified on the appropriate reference block using at least two reflectors of known dimension. Calibration verification shall be conducted at the following intervals:

a) At the start and end of a series of measurements.

b) Verification is recommended at least once every four hours during the measurements.

c) When substituting any system component.

d) Whenever the validity of the calibration is in doubt.

7.3.2. Calibration Changes

If any point on the sweep line has moved more than 0.050 inch:

a) Void all measurements made with the calibration in question that were performed after the previous valid calibration verification.

b) Conduct a new calibration

c) Remeasure the flaw height in the areas where the measurements have been voided.

8. GENERAL GUIDELINES

a) It is essential that the through-wall dimension of a flaw be verified by the use of more than one technique wherever possible.

b) Scanning sensitivity shall be established by adjusting the sensitivity to a level that exhibits a 5-30% Full Screen Height (FSH) baseline noise level (or as required by a specific technique). The sensitivity may have to be adjusted during the process in order to compensate for material changes.

c) Lower frequencies may have to be used in some instances where poor signal to noise (S/N) ratios inhibit data acquisition. (S/N ratios less than 2:1 may indicate the use of a lower frequency).

d) The presence of a signal may confirm the presence of a flaw in the area being investigated, however a lack of signal in the area when using a specific technique, is not conclusive evidence of the lack of a flaw. All practical techniques shall be used before a final determination is made.

e) Due to flaw orientation or material condition, particularly with coarse austenetic materials, sizing may be very difficult or even impossible. In these instances, the technician should state the confidence level on the Sizing Data Report. (Exhibit 1).

9. DECISION FLOW CHART

NOTE: The sizing method and Search Unit system shall be selected from the techniques described in this procedure. These selections are to be based upon the zone or zones of investigation in which the presence or absence of a flaw is to be confirmed.

9.1. Verify location and extent of flaw

9.2. Search for evidence of large flaw:

a) - High angle LW
b) - Full Vee path corner reflector
c) - Flaw tip diffraction

9.3. Search for evidence of small flaw:

a) - Flaw tip diffraction
b) - Multibeam techniques

9.4. Evidence of large flaw exists:

a) - Confirm with complimentary technique
b) - Prove that a small flaw does not exist

9.5. Evidence of small flaw exists:

a) - Confirm with complimentary technique
b) - Prove that a large flaw does not exist

NOTE: Confirmation may also be achieved by using different beam angles or by scanning from the opposite direction.

9.6. When two or more techniques exhibit differing results:

a) - Ensure that the indications are not from fabrication flaws.
b) - Eliminate low confidence results based on range of technique applicability and/or repeatability of results.
c) - When in doubt use value with the greater flaw height (through-wall depth).

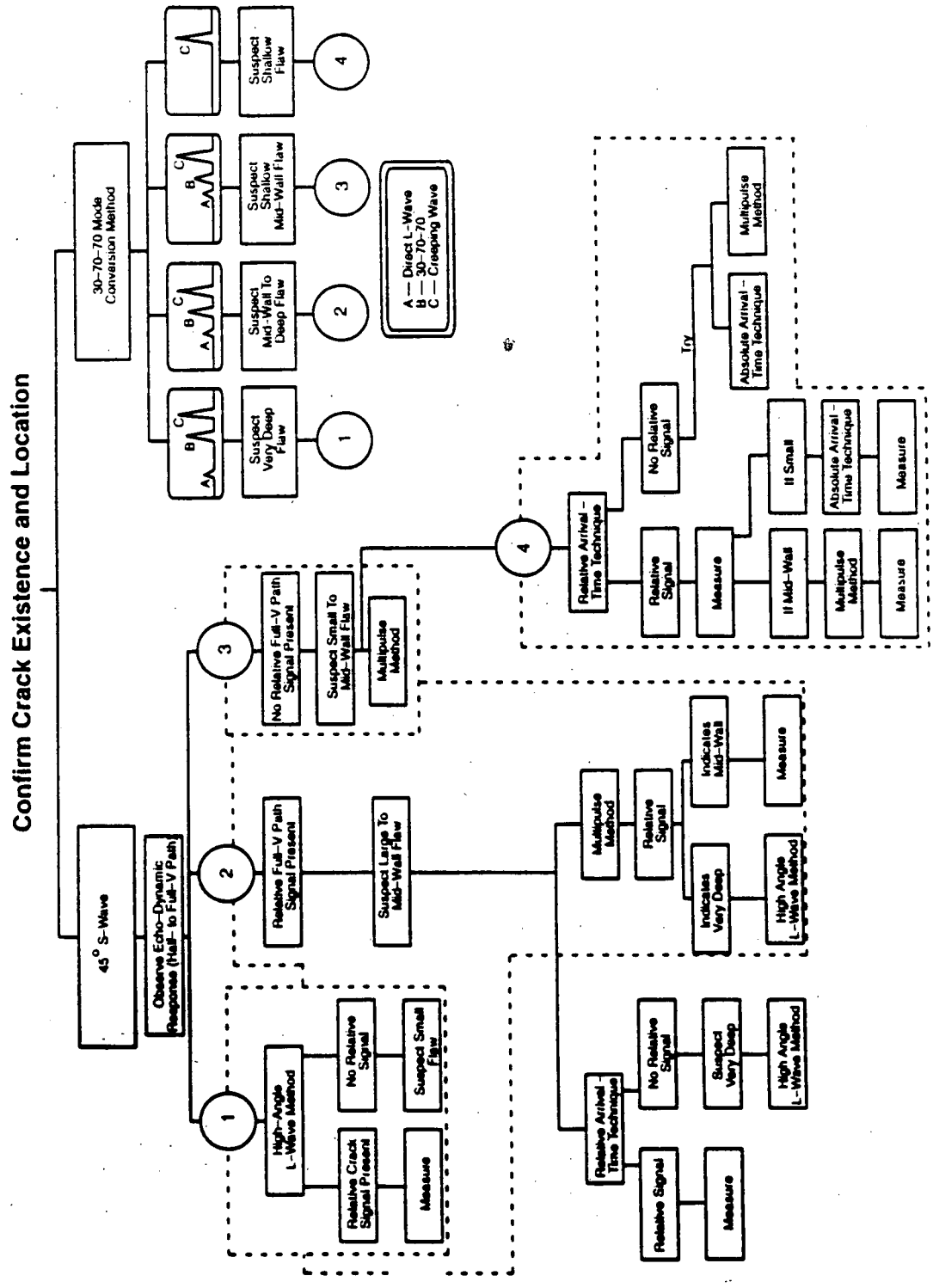


FIGURE 9.0
DECISION FLOW CHART

10. PROCEDURE

10.1. HIGH ANGLE LONGITUDINAL WAVE TECHNIQUE.

10.1.1. Description

The method uses dual element LW Search Units that are used to detect the flaw tip signal and is generally effective for sizing flaws greater than 75% throughwall. The effective "focal depth" of the sound beam will determine the sizing range. This method is less subject to potential geometric sources of error.

10.1.2. Limitations

a) This method is not capable of consistently identifying flaws that exist at depths greater than .5" from the OD of the component.

b) Weld crowns may impede access

c) Lower frequency Search Units may have to be used when material noise inhibits evaluation. These produce a larger beam spread resulting in signal maximizing difficulties. The use of the highest frequency practicable is recommended, supplemented by a lower frequency when necessary to improve S/N ratio.

10.1.3. Search Units

Frequency:	1.0MHz - 5MHz
Mode:	Longitudinal Wave
Angle:	85° - 45° (as appropriate to depth requirements)
Element(s):	Dual (single element may be employed)
Size:	As small as practicable; to allow working close to the weld crown and to allow coupling of both elements.

10.1.4. Calibration Block

CS or SS Sizing reference block depending on the material being evaluated.

10.1.5. Calibration

This calibration will result in a sweep that will display 0.8" in material depth across the CRT.

a) Position the Search Unit near the edge of the sizing reference block and maximize the first received signal from the end of the block. Using the sweep and delay controls, align this signal (peak) at screen division 2-2.3

b) Position the Search Unit as shown in Fig 10 A. Maximize the received signal from the .1" deep reflector and align the peak with screen position 3 as shown in Fig 10 B

c) Position the Search Unit for each of the remaining reflectors and align the signals as follows:

0.2" deep reflector at screen position 4
0.3" deep reflector at screen position 5
0.4" deep reflector at screen position 6
see Fig 10 B.

d) Other instrument sweep settings may be used. These will depend upon the suspected depth of the indication, and the focal range of the Search Unit being used.

e) Record the calibration data on the Sizing Report (Exhibit 1)

10.1.6. Evaluation

a) Sensitivity should be established by scanning an un-flawed area of the weld/component and observe the noise level in the calibration region of the CRT. Adjust the gain so that the noise level is less than 10% FSH.

NOTE: Observe the appearance and behavior of the noise signals, so that they may be later ignored when investigating the actual flaw.

b) When a large beam is used (large due to high angular beam spread or large elements), the tip signals may exhibit extensive travel across the instrument screen. Such signals are difficult to maximize accurately and therefore should be used non-quantitatively. Use a smaller beam or a different sizing method to obtain a numerical value for the crack height.

10.1.7. Calculation of Flaw Height

If no recordable signals were obtained in the calibrated region, then the high-angle, L-wave method has not found any evidence that the flaw penetrates near the outside surface. If recordable signals were present in the calibrated region but excessive signal travel precluded accurate definition of their sweep positions at maximum amplitude, then a quantitative value for flaw height cannot be obtained. The only conclusion is that the flaw was deep enough to approach the outside surface to within the calibrated depth range.

If recordable, accurately maximized signals were obtained, then calculate the indicated height by this formula:

$$h = t - 0.1" (s - 2)$$

where:

h = Height
t = Pipe wall thickness at the flaw location
s = Sweep position of the maximized recordable signal, expressed as the number of major sweep divisions
2 = Beam center entry point at 2 major sweep divisions

Compare the height measurements obtained from the pipe side and the weld side of the flaw. They should be almost equal. The measurement made from the weld side may be slightly lower if the crack follows the weld fusion line because the received signal will be a reflected wave from the top of the crack face instead of the extreme tip. If the heights are very different (more than two wavelengths), then one of the signals may have been a misinterpreted noise signal. If confirmation is achieved, be conservative and choose the most severe measurement.

Compare the height measurements obtained from different points along the length of the flaw. A flaw profile can be constructed from these measurements. If the profile shows large height changes with a small position change (small compared to the flaw length), suspect that some of the measurements were incorrect.

10.1.8. Height Verification by Other Methods

It is always good practice to verify a crack height estimate with more than one sizing method. The multipulse observation and sizing method is recommended for height confirmation. Investigation of the outside-surface area using 45° S-waves at a full-V path and the 30-70-70 mode-conversion method are also suitable confirmation methods which operate on significantly different principles from the high-angle, L-wave method.

This independent verification is especially critical in two cases:

- No indication of the presence of a deep flaw was obtained.
- The recorded signals were located in the deeper (from the examination surface), less intense part of the beam.

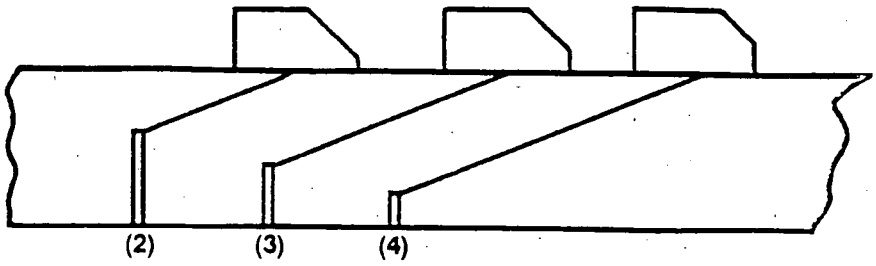


FIGURE 10A

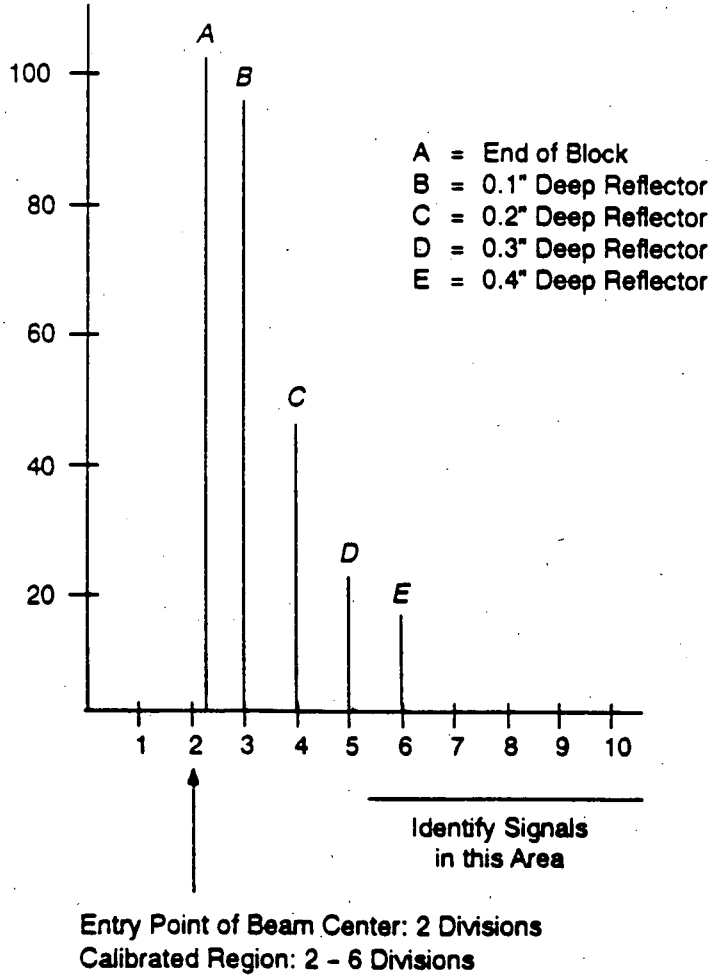


FIGURE 10B

10.2. FLAW TIP DIFFRACTION TECHNIQUE (FULL VEE)

10.2.1. Description

Full Vee Satellite Pulse Observation Technique (SPOT) (also – Relative Arrival Time Technique – RATT)

a) This method is applicable in situations where weld crown considerations limit access by other tip diffraction techniques and is effective for sizing flaws that propagate approximately 80% through wall, or greater. It is also used to compliment the results obtained with PATT (see 10.4) and is based on measurement of the time of flight (TOF), but in most cases it is used to confirm a large through wall flaw and not to provide accurate measurement.

b) The technique is based upon the recovery of the reflected sound energy from the base and tip of a flaw that has propagated partially through the pipe wall. The technique comprises measurement of the distance between the relatively large response from the flaw opening at the component ID and the smaller response from the flaw tip.

10.2.2. Limitations

a) Weld geometry can influence the results.

b) The amplitude of the tip signal is usually very low. In the case of austenitic material, the grain noise may make it difficult to see.

c) The nature of some flaws have the potential for many diffraction centers.

d) Wedge noise may appear in the area of interest.

CAUTION: If the sound beam must pass through weld material, there is potential for the beam to be redirected. Other angles may have to be considered.

10.2.3. Search Units

Elements: Single

Frequency: 1.5MHz – 5MHz

Mode: Shear Wave

Angle: 35° – 70°

Damping: Medium – 3 or 4 cycles maximum. (See transducer documentation as appropriate.)

Size: As small as practicable. The distance from the front of the wedge to the beam index point should be short. (CAUTION: Wedge noise)

10.2.4. Calibration Block

CS or SS Sizing reference block depending on the material being evaluated.

10.2.5. Calibration (Depth)

a) Select two notches within the sizing reference block that bracket the depth range of interest. (This will provide assurance that the Search Unit selected is appropriate for the evaluation).

b) Set the signal from the base of a deep notch of known depth at 1/2 Vee path.

c) Move the Search Unit backward to obtain a corner reflection from the top of the notch (see Figure 10C[a]). It will be necessary to adjust the delay control while moving the Search Unit.

d) Move the Search Unit forward until the doublet* is observed and maximize the first signal, which is the diffracted signal from the notch tip.

e) The doublet represents the thickness of material between the notch tip and the OD surface.

f) Adjust the instrument controls until these two signals are separated by the correct amount, peak to peak. (i.e., 1 screen division = .100 or .200 as appropriate).

g) Record the appropriate calibration information on the Sizing Report (Exhibit 1).

*: DOUBLET = Two signals displayed on the CRT screen simultaneously. One signal is the reflection from the flaw opening at the surface, while the other is the diffracted wave front from the tip of the flaw (see Figure 10C, a+b).

10.2.6. Evaluation

NOTE: The presence of the upper corner signal is usually an indication that the flaw has considerable through wall dimension.

a) Sensitivity should be established on the component being evaluated. It should be set at a level to allow discrimination of the flaw tip from the background noise.

b) Position the Search Unit to obtain a signal from the flaw base at 1/2 Vee path.

c) Move the Search Unit back to obtain a corner reflection from the top of the flaw.

d) Scan to locate a doublet, and where this exists, maximize the first (tip) signal.

NOTE: It may be necessary to adjust the delay control during the evaluation. This will not affect the calibration.

e) It is not necessary to maximize the signal amplitude once a doublet is located. It is important that the doublet is measurable and repeatable.

f) Measure the difference between the two peaks in accordance with the calibration set up.

g) The separation indicates the material thickness above the flaw tip.

10.2.7. Depth Measurement

Flaw depth is determined by the use of the following calculations:

Step 1 $RW = (SDT - SDC) * SDF$

Step 2 $d = T - RW$

Where:

d = Flaw depth from component ID

SDC = Screen division reading for corner signal

SDF = Screen division factor (value of each major screen division)

SDT = Screen division reading for flaw tip

T = Component thickness

RW = Remaining wall thickness

See Figure 10C(a) and (b)

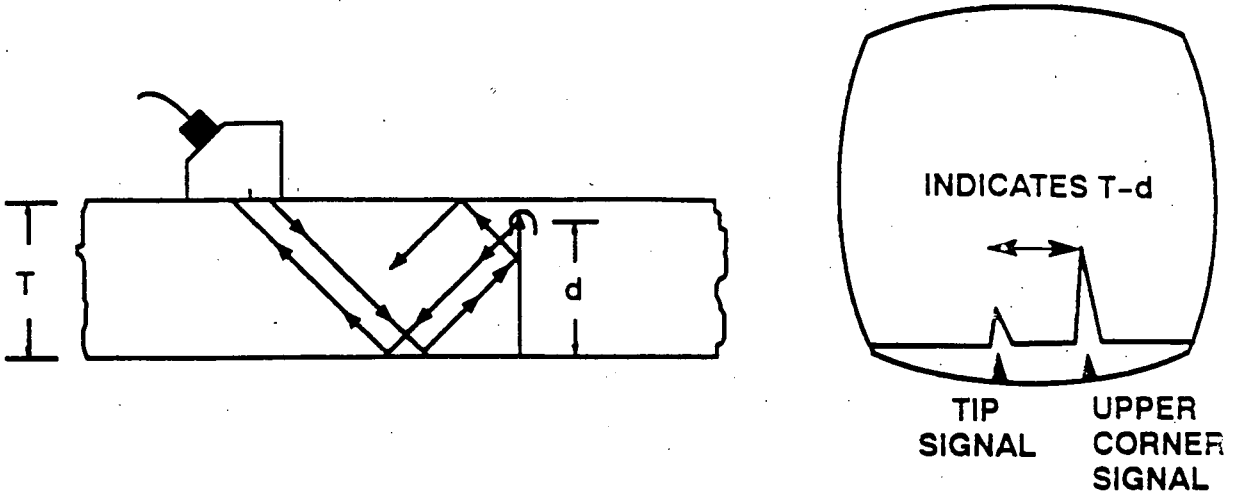


FIGURE 10C(a)

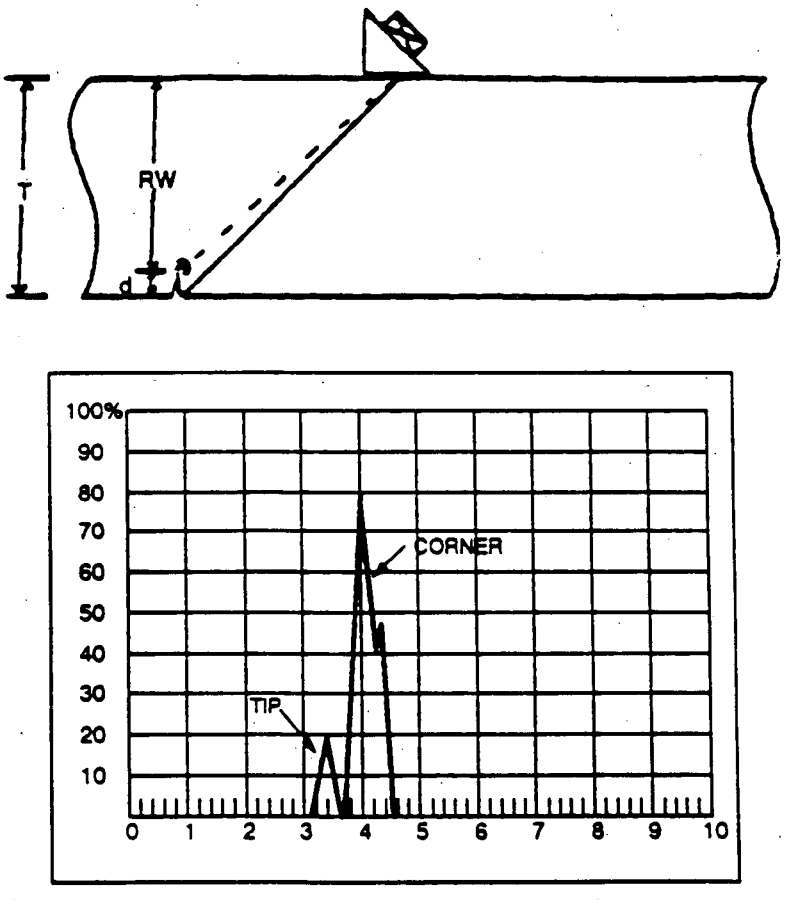


FIGURE 10C(b)

10.3. FLAW TIP DIFFRACTION TECHNIQUE (HALF VEE)

10.3.1. Description

Half Vee Satellite Pulse Observation Technique (SPOT)
(also - Relative Arrival Time Technique - RATT)

a) The technique is based upon the recovery of the reflected sound energy from the base and tip of a flaw that has propagated partially through the pipe wall. The technique comprises measurement of the distance between the relatively larger response from the flaw opening at the component ID and the smaller response from the flaw tip.

10.3.2. Limitations

a) Tip signals from very shallow flaws (e.g. 0.1" or less from the ID) are difficult to evaluate. The tip signal may be too close to the flaw opening to be resolved.

b) The amplitude of the tip signal is usually very low. In the case of austenitic material, the grain noise may make it difficult to see.

c) The nature of some flaws have the potential for many diffraction centers.

CAUTION: If the sound beam must pass through weld material, there is potential for the beam to be redirected. Other sound propagation modes and/or angles may have to be considered.

NOTE: Refracted Longitudinal Waves are less subject to redirection and grain noise. LW techniques shall be limited to 1/2 Vee only.

10.3.3. Search Units

Elements:	Single or Dual
Frequency:	1.0MHz - 5MHz
Mode:	Shear Wave or Longitudinal Wave
Angle:	45° - 60°
Damping:	Medium - 3 or 4 cycles maximum.
Size:	As small as practicable. The distance from the front of the wedge to the beam index point should be small. (CAUTION: Wedge noise)

10.3.4. Calibration Block

CS or SS Sizing reference block depending on the material being evaluated.

10.3.5. Calibration (Depth)

a) Select two notches within the sizing reference block that bracket the depth range of interest. (This will provide assurance that the Search Unit selected is appropriate for the evaluation).

b) Locate the signals from the notch corner and tip simultaneously on the CRT screen and hold the Search Unit stationary.

c) With the sweep and delay controls, separate the signals on the screen so that a convenient notch depth/division scale is obtained.

EXAMPLE: Using a .1" notch, separate the signals from the notch base and tip by one major screen division. The screen will now be calibrated for .1" flaw depth/screen division. The distance between the ID surface (corner) reflection and the flaw tip is a direct reading of the flaw depth (see Figure 10D). Other units of calibration may be used as appropriate, (e.g. .2" per major screen division)

d) Repeat the above exercise using a different notch depth.

e) The actual position of the signal on the CRT screen is not important, however the doublet* signals must be visible within the evaluation area.

f) Record the appropriate calibration information on the Sizing Report (Exhibit 1).

* DOUBLET = Two signals displayed on the CRT screen simultaneously. One signal is the reflection from the flaw opening at the surface, while the other is the diffracted wave front from the tip of the flaw (see Figure 10D).

10.3.6. Evaluation

a) Evaluation sensitivity shall be established on the component being evaluated. This shall be at a level that allows for segregation and measurement of the flaw tip signal position on the CRT screen.

b) Position the Search Unit to obtain a signal from the flaw base at the 1/2 Vee path.

c) Scan the Search Unit to locate the doublet.

d) If the doublet is observed, measure the time difference between the two peaks.

e) The separation indicates the depth of the flaw.

f) Subtract this measurement from the component wall thickness to obtain the remaining material thickness above the flaw.

10.3.7. Depth Measurement

Flaw depth is determined by the use of the following calculations:

$$d = (SDC - SDT) * SDF$$

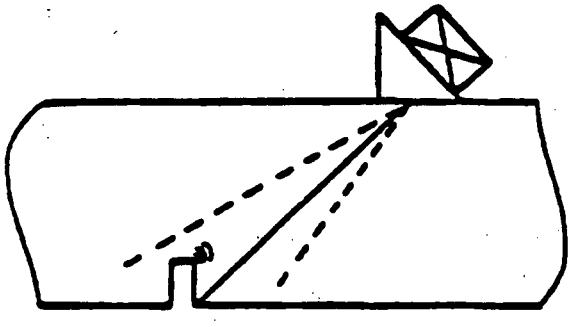
Where:

d = Flaw depth from component ID

SDC = Screen division reading for corner signal

SDF = Screen division factor (value of each major screen division)

SDT = Screen division reading for flaw tip



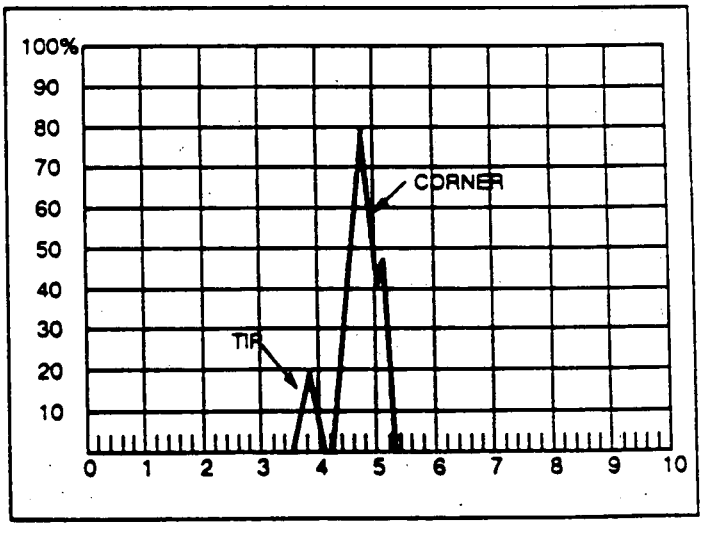


FIGURE 10D

10.4. FLAW TIP DIFFRACTION TECHNIQUE (PATT)
(also - Absolute Arrival Time Technique - AATT)

10.4.1. Description

Pulse Arrival Time Techniques.

a) This technique is based on the recovery of the reflected sound energy from the tip of the flaw which has propagated partially through the component wall.

b) This method is effective for sizing flaws over a wide depth range, usually 20% to 80% through wall.

10.4.2. Limitations

a) Maximizing the flaw tip signal is required when using PATT. The presence of a weld crown could possibly prohibit the use of this technique.

b) Tip signals from very shallow flaws (.100" or less from the ID) are difficult to size. The tip signal may occur close to the signal from the flaw opening and may not be resolved.

c) The tip signal from a very deep flaw may be lost in the "noise" from the front surface.

CAUTION: Where the sound beam passes through weld material, it may be redirected. In this case, other angles or modes of sound propagation may have to be considered.

NOTE: Refracted Longitudinal Waves are less subject to redirection and grain noise. LW techniques shall be limited to 1/2 Vee only.

10.4.3. Search Units

Elements:	Single or Dual
Frequency:	1.0MHz - 5MHz
Mode:	Shear Wave or Longitudinal Wave
Angle:	45° - 60°
Damping:	Medium - 3 or 4 cycles maximum. (Higher damping is desirable where obtainable).
Size:	As small as practicable. The distance from the front of the wedge to the beam index point should be short. (CAUTION: Wedge noise)

10.4.4. Calibration Block

CS or SS Sizing reference block depending on the material being evaluated.

10.4.5. Calibration (Depth)

a) Select two notches within the sizing reference block that bracket the depth range of interest. (This will provide assurance that the Search Unit selected is appropriate for the evaluation).

b) Locate the tip signals from a shallow and a deep notch.

c) With the sweep and delay controls, adjust the arrival time distance so that the signals appear at the correct number of screen divisions from the left of the screen. (See Figure 10E)

d) The instrument should be calibrated so that the extreme left (0 position) of the screen represents a through wall flaw and the extreme right (position 10) represents a convenient dimension below the OD surface.

EXAMPLE: Using a 1" thick sizing reference block, each major screen division = 0.100". The 80% notch tip is positioned at screen division 2, and the 20% notch tip is positioned at screen division 8. The remaining wall thickness can be read directly in this range.

e) Record the appropriate calibration information on the Sizing Data Report (Exhibit 1).

10.4.6. Evaluation

a) Evaluation sensitivity shall be established on the component being evaluated. This shall be at a level that allows for segregation and measurement of the flaw tip signal position on the CRT screen.

b) Position the Search Unit to obtain a signal from the flaw base at 1/2 Vee path.

c) Move the Search Unit forward to obtain a tip signal from the top of the flaw (where present).

d) Maximize this signal and measure the time of arrival on the CRT screen (depth).

e) The measured dimension is equal to the thickness of remaining material above the flaw tip.

10.4.7. Depth Measurement

Flaw depth is determined by the use of the following calculations:

Step 1 RW = SDT * SDF

Step 2 d = T - RW

Where:

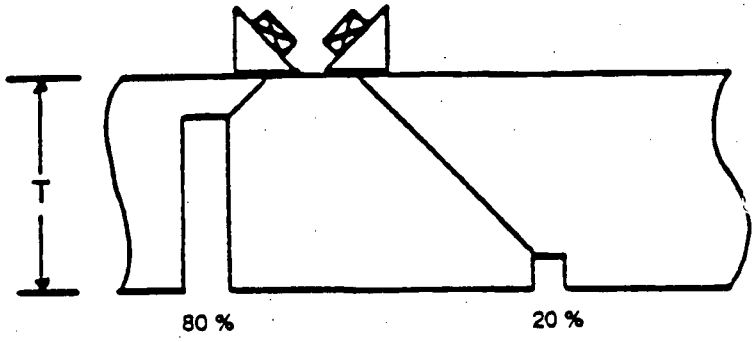
d = Flaw depth from component ID

SDF = Screen division factor (value of each major screen division)

SDT = Screen division reading for flaw tip

T = Pipe Thickness

RW = Remaining Wall Thickness



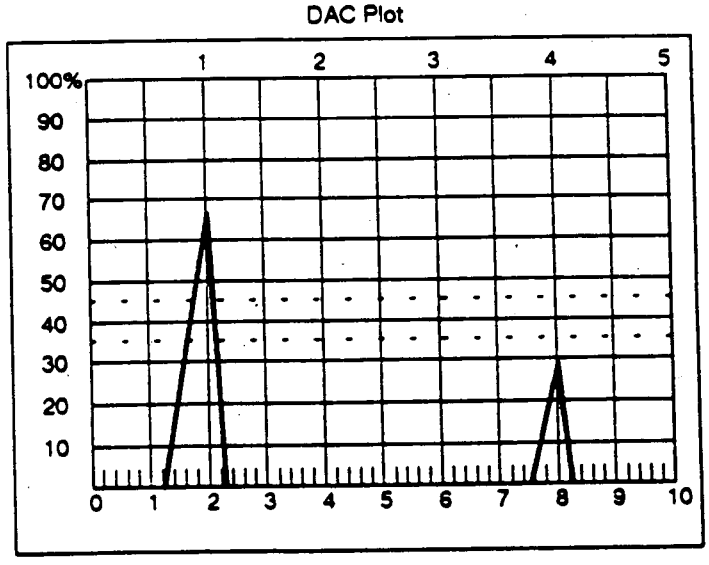


FIGURE 10E

10.5. 30-70-70 MODE CONVERSION METHOD

10.5.1. Description

a) This method is based on the use of the information produced by reflections of direct and mode converted signals from a single element Search Unit. It is especially effective for detection of IGSCC and may be used to obtain somewhat qualitative sizing information from flaws that exist within a range of 10% to 40% of the component's through wall dimension.

b) If the flaw depth exceeds 10% of the component wall thickness, a signal is observed on the CRT screen. This is a signal that occurs as the 30° SW mode converts at the flaw face and returns as a LW. (CE-2, see definition below).

c) Flaws that are greater than 15% to 20% of the component's through wall dimension may produce a LW reflection that is from either, a direct reflection from the flaw face, or a diffracted signal from the flaw tip. (CE-1, see definition below).

10.5.2. Limitations

a) This method is qualitative and should be used to classify flaws as "shallow" or "medium depth". Accurate flaw sizing information is not possible with this method.

b) The presence of weld crown may prohibit the use of this method.

CAUTION: The absolute 30° SW sound component is not used in this sizing technique. Its presence can be confusing due to the nature and position of the high amplitude signals from irrelevant sources at the ID surface.

10.5.2.1. Definitions

CE-1 Collateral Echo #1. A signal produced from a mode converted 30°SW as it strikes the component ID and reflects off a 20% or greater through wall flaw. This returns as a 70° LW. (See Fig. 10F)

CE-2 Collateral Echo #2. A 30° SW that is mode converted to an ID Creeping Wave signal which reflects from the base of an ID flaw. (See Fig. 10F)

ID CREEPING WAVE - A mode converted portion of the SW that is produced on the ID surface of the component as the SW strikes the ID at a specific angle and travels at approximately the velocity of the LW component along the ID surface.

10.5.3. Search Units

Element: Multiple

Frequency: 2 - 4 MHz

Mode: LW/SW/Creeping Wave

Angle: 30° - 70° - 70°

Designation: WSY 70

10.5.4. Calibration Block

CS or SS Sizing reference block depending on the material being evaluated.

10.5.5. Calibration

a) Establish a sweep length that represents 2 x the component wall thickness.

b) With the Delay control, adjust the instrument so that the Initial Pulse (IP) appears at the left hand side of the CRT screen.

c) Observe the signals from at least two calibration reflectors and adjust the sweep to establish a linear presentation.

d) Locate and maximize the CE-2 signal produced by reflection from the 10% notch (See Figure 10F).

e) Set the signal amplitude to a minimum of 80% FSH.

f) Align the signal with the sweep control at position 7 on the CRT Screen and mark the screen at leading edge of the signal.

g) Locate a CE -1 signal from the 40% notch and note its location relative to the CE -2 signal.

h) The screen locations, signal amplitudes and Echo Dynamics from the various notches should be noted and compared with those of the CE-2 signals.

i) Record the appropriate calibration information on the Sizing Data Report (Exhibit 1).

10.5.6. Evaluation

a) Position the Search Unit to obtain a CE -2 signal from the flaw.

b) Maximize this signal and set its amplitude to 100% FSH.

c) Move the Search Unit away from the flaw and search for a CE-1 signal.

d) Maximize the CE-1 signal and compare its amplitude with a corresponding (similar) signal from a notch in the reference block.

e) Manipulate the Search Unit and observe the echo dynamics. Compare these with the echo dynamics observed when scanning the appropriate notches within the reference block.

NOTE 1: The absence of a CE-1 indicates that the flaw is less than 10%-15% through wall.

NOTE 2: The CE-1 signal saturates when interrogating flaws of approximately 40% to 50% through wall. Therefore a flaw with a greater through wall dimension (e.g. 70%) could appear to exhibit a similar amplitude as a 40% through wall flaw.

NOTE 3: The absence of a CE-2 signal may possibly indicate that the original suspected flaw signal may actually be produced by geometric of metallurgical sources.

NOTE 4: The absence of a CE-2 signal could also indicate that coverage of the area of interest is not being provided by the sound beam.

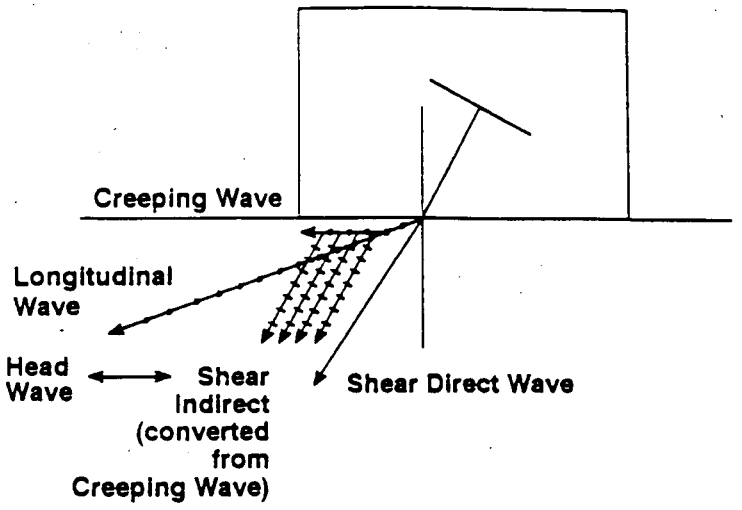
10.5.7. Depth Measurement

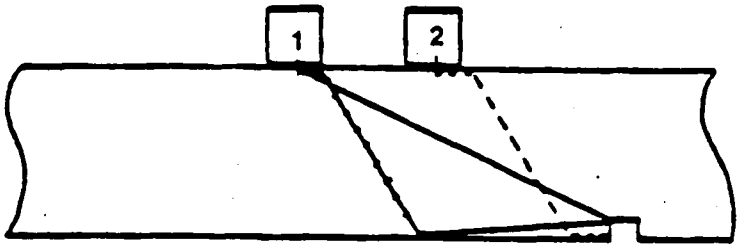
There are no calculations required for this method. Use the information obtained from the technique to determine if the flaw is:

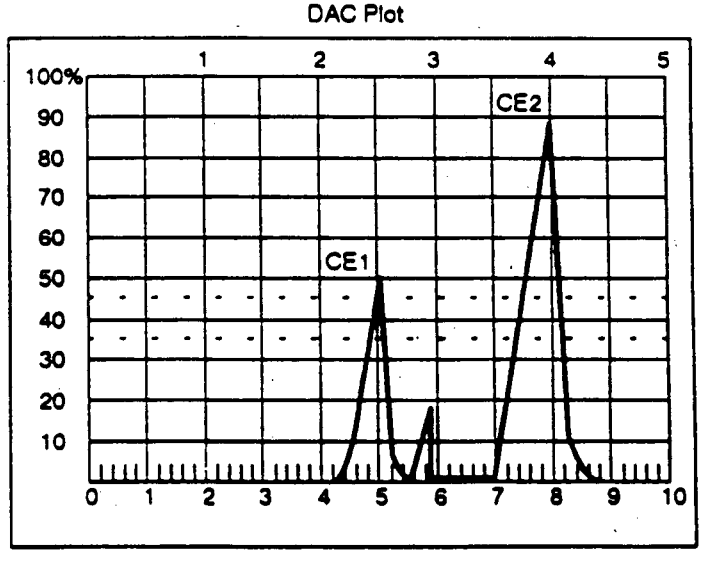
1) An actual flaw

2) A shallow flaw - 10% - 15% through wall (small or no CE-1)

3) A medium flaw 15% - 40% through wall (various amplitude CE-1 signals).







Position 1 for CE-1
Position 2 for CE-2

FIGURE 10F

11. MULTIPULSE OBSERVATION SIZING TECHNIQUE (MOST)

11.1. Description

11.1.1. This technique is effective for sizing ID connected flaws in a component that is approximately 0.4" - 1.6" in wall thickness.

11.1.2. The multipulse observation sizing method is based on the use of a bimodal search unit. This two-element transducer was designed to insonify the entire pipe wall by transmitting and receiving high-angle longitudal waves (L-waves) as well as low-angle shear waves (S-waves). For this reason, the multibeam sizing techniques that feature the bimodal search units are applicable to inside-surface connected planar flaws from 10-90% through-wall.

11.1.3. The multibeam relative arrival-time technique (RATT) is particularly useful because the flaw height-related separation, σ, between the direct L-wave and the mode-converted signals can be measured well before the module is restricted by the weld crown. The absolute arrival-time technique, on the other hand, requires that the first pulse, the tip-diffracted L-wave pulse, be maximized prior to reading the arrival-time difference, τ, between the midscreen division mark and the peaked first pulse against the instrument time base calibrated in through-wall distance. Both σ and τ measurements are independent of signal amplitudes.

11.1.4. A single, edge-diffracted pulse from a distance of 0.8 inch, below the examination surface is sufficient to calibrate the time base for pipe in the 0.4-1.6 inch wall thickness range. Flaw height may be read directly on the screen in percent of wall thickness. The extent of the flaw is indicated by the pulses that run into the left half of the screen. The further the direct L-wave is separated from the mode-converted pulse, or peaks from midscreen, the higher the flaw. Pulses originating from the interaction of S-waves with the base of the flaw, with or without mode conversion (i.e., the mode-converted pulse and the inside-surface creeping-wave pulse), are confined to the right half of the screen and merely indicate the presence of a flaw.

ρ - Rho

σ - Sigma

τ - Tau

11.1.5. Limitations

The limitations of the multipulse observation method are summarized as follows.

a) The multipulse sizing method requires a special searching-and-sizing unit.

b) Instruments without RF displays are at some disadvantage in recognizing satellite pulses.

c) The doublet separation and time delay measurement techniques are new and need a lot of familiarization.

d) The multipulse observation method is not immune to false satellite pulses due to branched cracking and missed satellite pulses due to tight crack tips.

e) CRT presentations without a clearly recognizable mode-converted pulse may be difficult to interpret in terms of relative arrival-time measurements.

f) Flaw height must be estimated solely on the basis of absolute arrival-time measurements when the mode-converted echo and the inside-surface creeping wave pulses are absent.

11.2. WAVE PROPAGATION THROUGH THE MATERIAL

11.2.1. It is acknowledged that S-waves cannot interact effectively with the upper extremities (tips) of tight and branched, medium to large IGSCC located near the sound-scattering fusion lines of austenitic piping welds and produce readily recognizable tip-diffracted signals, or satellite pulses, for crack-sizing purposes. The bimodal search unit is designed especially for austenitic pipe examination. As shown in Figure 11a, it transmits one L-wave and one S-wave and receives two L-waves (one from each crack extremity), one mode-converted pulse from the crack face, and one S-wave from the crack base when the instrument is operated in the through-transmission mode. Either element, the front or the back, can be connected to the transmitter.

11.2.2. The directivity patterns of the bimodal modules are quite broad due to the relatively small active-element size and low operating frequency. Therefore, the high L-wave beams (beam angles up to 90°) and the low S-wave beams (beam angles down to 25°) insonify the entire pipe wall. Four associated pulses that move together on the CRT screen can be expected when the search unit is scanned over an inside-surface connected flaw with broad back-and-forth movements. This follows from the premise that while the L-waves interact effectively with both extremities of the flaw,

the S-waves interact only with the flaw base. The first pulse originates from the upper target area (i.e., the flaw tip). If each element were a transmitter, the L-waves of the two elements would converge to this area (Figure 11b). The usually weak tip-diffracted wave is enhanced while the background of irrelevant indications is suppressed by restricting the L-wave beams to the upper target area. The next pulse can sometimes be observed from a crack and usually observed from an inside-surface notch as a result of the L-wave beam from the transmitter reflecting at the crack base and being received as an L-wave by the receiver. The third pulse is usually the strongest because it results from corner reflection of the mode-converted S-wave from the lower face of the flaw. The reflection of the incident S-wave at the flaw opening results in the fourth pulse which is analogous to the inside-surface creeping wave of the 30-70-70 sizing method.

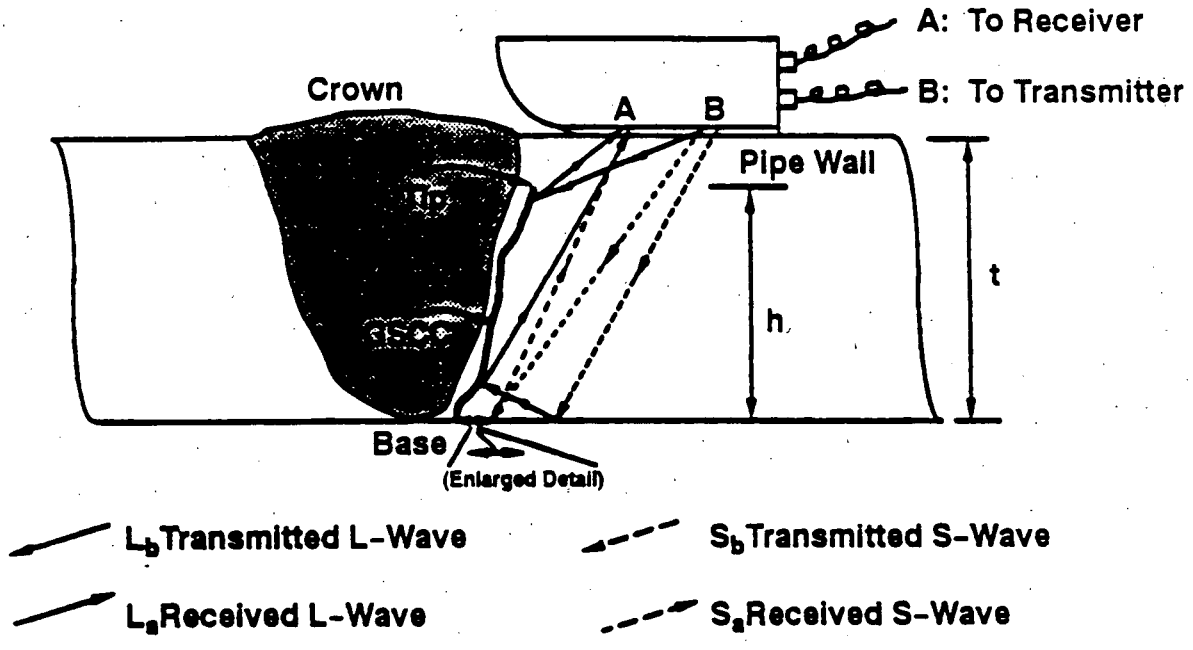
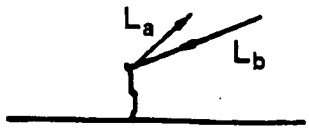


FIGURE 11a
TRANDUCER MODULE FOR AUSTENITIC PIPE EXAMINATION

11.2.3. The echo-dynamic curve (signal amplitude plotted versus module position relative to flaw location) is broadest for the L-wave pulse and narrowest for the creeping-wave pulse (Figure 3). The mode-converted pulse peaks shortly after the flaw is insonified. It follows from geometrical considerations (Figure 11c) that the echo-dynamic curves for the L-wave pulse and the creeping-wave pulse are nearly synchronous for a large flaw (i.e., the rise in the amplitude of each pulse is in concert with the amplitude rise of the other). When the center of the incident L-wave beam is directed toward the flaw tip, the center of the incident S-wave beam is directed toward the flaw base, and the amplitude of the L-wave pulse, as well as that of the creeping-wave pulse, is maximized. Upon moving the search unit any closer to the flaw, the tip-diffracted L-wave pulse with again recede into the background of irrelevant indications. To determine the arrival time of this pulse (denoted by T in Figure 11d) the operator typically moves the search unit toward the flaw until the amplitude drops.

Direct L-Wave from Tip

L_a meeting L_b at the crack tip

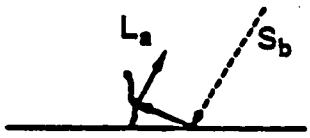


Direct L-Wave Pulse from Base

L_a meeting L_b at the crack base

Mode-Converted Pulse

L_a meeting mode-converted S_b at the crack base



Creeping-Wave Pulse

S_a meeting S_b at the crack base

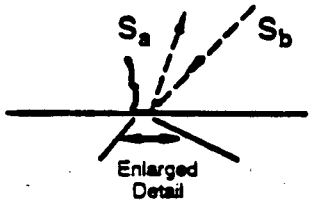


FIGURE 11b

INTERACTION OF THE INCIDENT L-WAVE AND S-WAVE FROM A BIMODAL SEARCH UNIT WITH AN INSIDE-SURFACE CRACK RESULTING IN FOUR ASSOCIATED PULSES

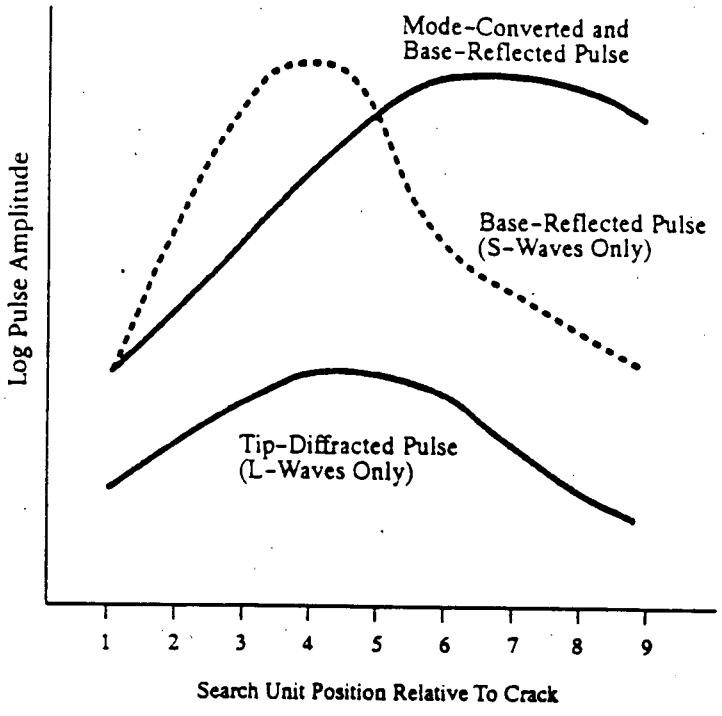


FIGURE 11c

ASYNCHRONOUS ECHO-DYNAMIC CURVES FOR A 50% HIGH INSIDE-SURFACE NOTCH

11.3. PRINCIPLES OF RELATIVE ARRIVAL-TIME TECHNIQUE

11.3.1. The tip-diffracted wave pulse may be considered as the satellite of the mode converted pulse since their separation (doublet separation σ), measured in screen divisions, is practically independent of the axial coordinate of the module relative to that of the flaw. Figures 11d and 11e illustrate the nearly linear relationship between normalized flaw height h/t and σ. Here t denotes the local wall thickness measured with a contact 0° L-wave search unit at the flaw location and h denotes the flaw height. Note that the flaw height estimation curves in Figure 11e are parametric in t. The most useful feature of the multipulse observation sizing method is that a can be measured anywhere along the pipe as long as both the tip-diffracted L-wave and the mode-converted pulses are seen moving in unison on the screen. Thus, σ measurements may be performed even when there is a weld crown present (Figure 11a).

11.3.2. A second relative arrival-time measurement may sometimes be used to confirm the σ measurement. This second measurement is obtained by noting the difference in arrival time, ρ, of the tip-diffracted L-wave pulse and the L-wave pulse from the crack base, if it is obtained. These two pulses also move in unison and form a linear relationship when the flaw is oriented vertically.

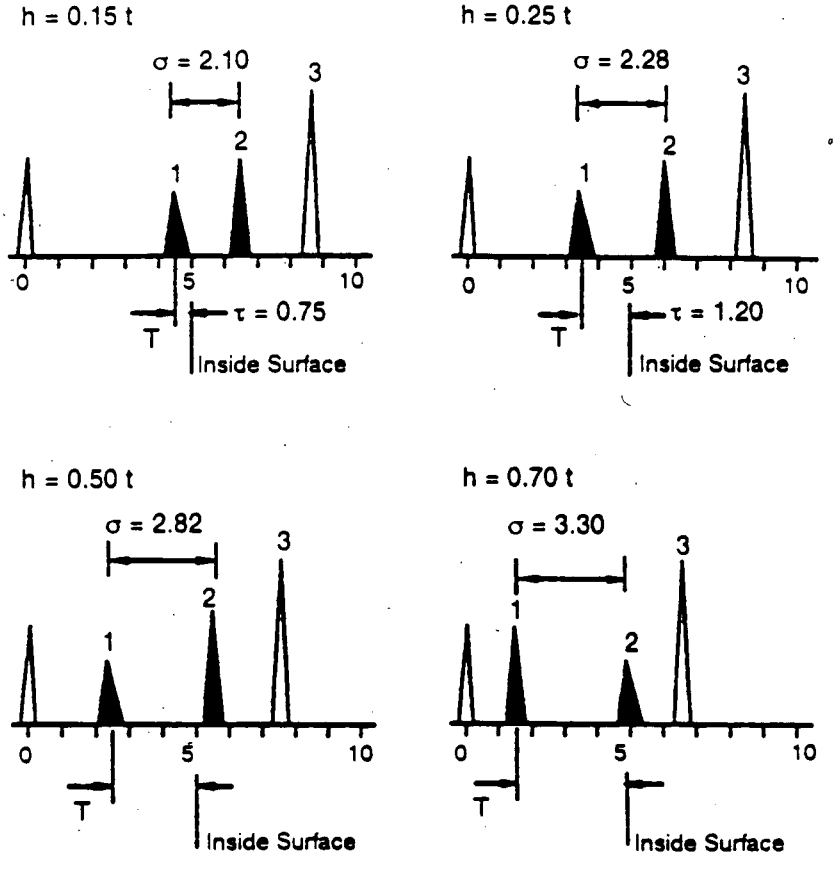


FIGURE 11d

Relationships Among Normalized Flaw Height, *h/t*, Doublet Separation, σ and Time Delay, τ

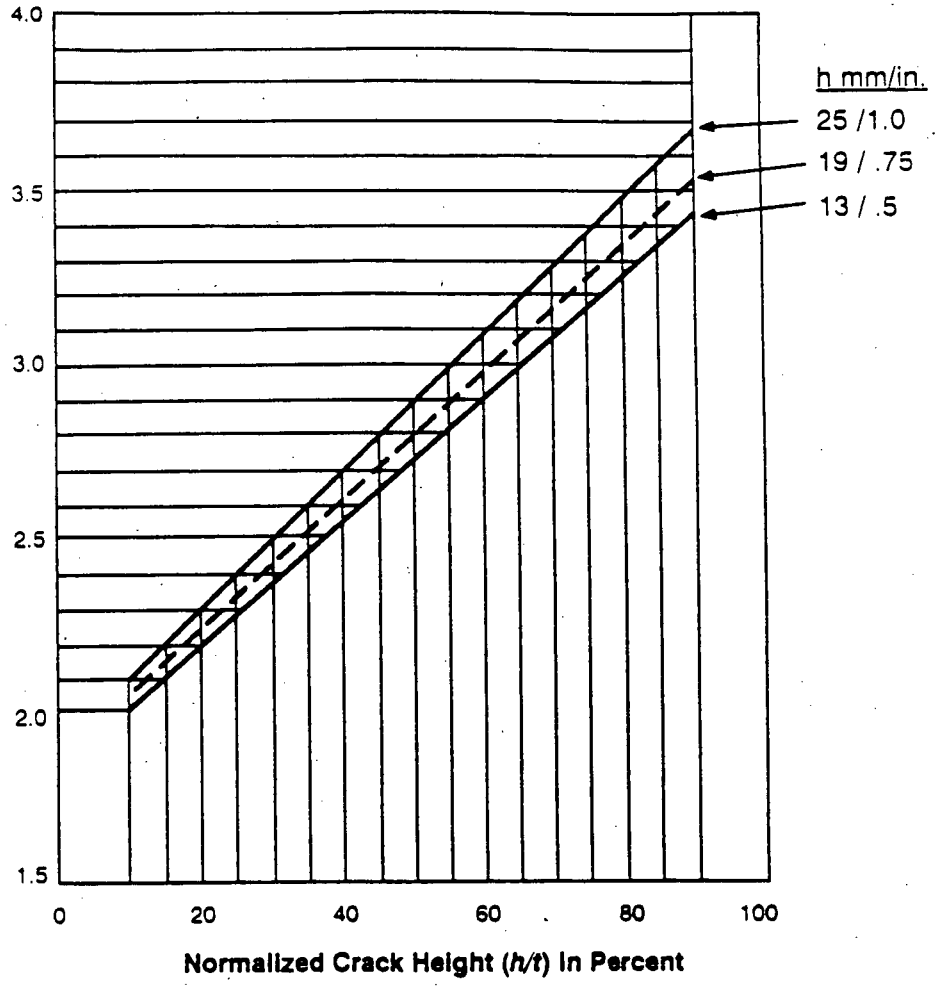


FIGURE 11e

Correlation of Normalized Flaw Height With Doublet Separation, σ, Obtained by the Multibeam Relative Arrival-Time Technique

11.4. PRINCIPLES OF ABSOLUTE ARRIVAL-TIME TECHNIQUE

11.4.1. Weld crown permitting, the search unit may be moved toward the weld far enough to peak the tip-diffracted L-wave pulse. There was no weld crown in the proof-of-principle τ measurements shown in Figure11d; the satellite pulses were readily peaked by broad back-and-forth module movements to obtain a second linear measure of flaw height. This estimate is based on the separation between the peaked satellite pulse and the fictitious tip-diffracted pulse from an edge located at the base of the flaw, which would peak at the 5 screen division mark. Figure 11f shows that the relationship between τ in screen divisions and *h/t* in percent is very

nearly linear and independent of pipe wall thickness. The simplicity of the procedures to calibrate the instrument time base for τ, as well as σ and ρ measurements, is due to the unique properties of the bimodal search unit design.

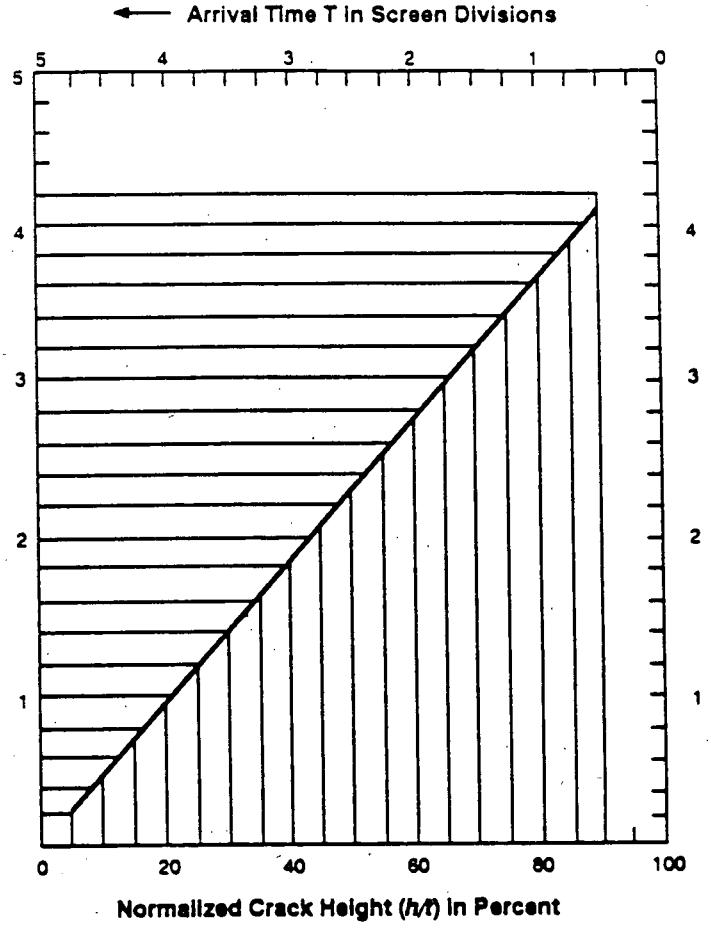


FIGURE 11f

Correlation of Normalized Crack Height With Time Delay, τ, Obtained by the Multibeam Absolute Arrival-Time Technique

11.5. EQUIPMENT

11.5.1. Search Unit

The searching and sizing unit consists of two moderately damped transducers, one mounted behind the other on a common lucite wedge with two wedge angles. Both elements are bimodal, i.e., each is capable of transmitting and receiving both an.L-wave and an S-wave. The roles of the two elements can be interchanged.

11.5.2. Beam Angles

In the pitch-catch mode of operation, the element in the back transmits a high angle, L-wave beam, as well as a low-angle, S-wave beam. The element in the front is directed to receive all waves emanating from the upper and lower extremities of an inside-surface connected planar flaw.

11.5.3. Instrument

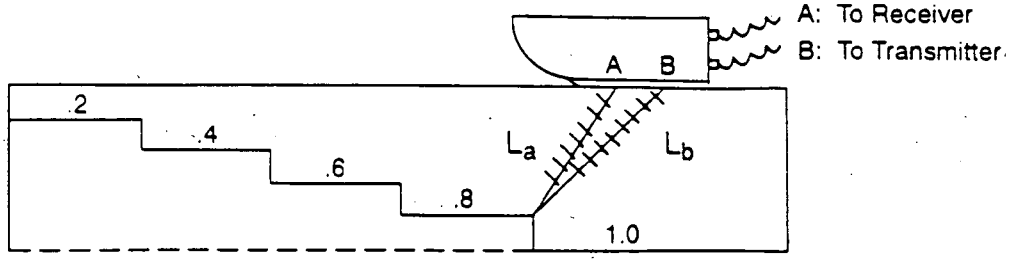
Any commercial transmit/receive, pulse-echo, ultrasonic instrument capable of generating and receiving frequencies in the range of at least 1 to 5 MHz with linear and stable time base should be suitable for sizing with the multipulse observation sizing method. A radio-frequency (RF) display mode is not required but is desirable.

11.5.4. Calibration Block

Calibration for this sizing method requires special calibration blocks. As with the other sizing methods the calibration block must have a set of planar reflectors located at various depths from the examination surface.

11.6. CALIBRATION

11.6.1. A calibration block containing steps (Figure 11g or with similar reflectors) is necessary to calibrate the time base of the ultrasonic instrument for σ and τ measurements for flaws in components that vary in thickness from 0.4 to 1.6 inch. Each step in the 1 inch thick calibration block is 0.2 inch high. This block supports all of the instrument's timebase calibrations and some of the sensitivity calibrations for the reliable and accurate characterization of planar flaws potentially present in piping systems.



Calibrating for Inches of Through-Wall Distance

FIGURE 11g

A BIMODAL MODULE POSITIONED ON THE CALIBRATION BLOCK FOR MAXIMUM TIP-DIFFRACTED PULSE AMPLITUDE FROM THE FOURTH STEP

11.6.2. Time-base calibration for σ and τ measurements should be conducted as follows.

a) Connect the module to a high-resolution instrument operated in the pitch-catch mode.

b) Peak the tip-diffracted signal that marks the location in through-wall direction of the calibration block's entry surface and adjust the delay control to place this signal at the origin of the time base (pulse arrival time = 0).

c) Peak the satellite pulse from the diffracting edge of the step in the 1 inch thick calibration block at 0.8 inch from the examination surface (see Figure 11g). This pulse is called the calibration signal.

d) Adjust the material calibration and delay controls so that the calibration signal is separate from the initial pulse (at t = 0) by 4 screen divisions.

e) Verify that the satellite pulses from the steps at 0.2, 0.4 and 0.6 inch below the examination surface occur at the 1, 2, and 3 division marks, respectively. Make fine adjustments of the controls until the time base has been made as linear as possible.

f) Assign 100% of wall thickness crack height to the origin of the time base and 0% of wall thickness crack height to the 5 division mark. The instrument is now calibrated to read the normalized height, h/t, of an inside-surface flaw in a 1 inch thick component on the basis of τ measurements.

g) Adjust the delay and material calibration controls so that the calibration signal peaks at 0% (i.e., it appears at the 5 division mark) with the initial pulse still at 100%. The instrument is now calibrated for 0.8 inch thick components.

h) Enter the instrument settings (range, material calibration, and delay) onto the *Calibration Data Sheet* across from the t = 0.8 inch entry under pipe thickness (see Table 1 or Table 2).

i) Adjust the instrument so that the calibration signal appears at -100% (i.e., at the 10 division mark) and the initial pulse still stands at 100%. The instrument is now calibrated for 0.4 inch thick components.

j) Enter the instrument settings into the *Calibration Data Sheet* across from the t = 0.4 inch entry.

k) Adjust the instrument so that the calibration signal appears at 50% (i.e., at 2.5 divisions) while the initial pulse is still at 100%. The instrument is now calibrated for 1.6 inch thick pipe.

l) Continue determining instrument settings for other wall thicknesses as shown in Table 1.

m) Plot the settings of the calibrated instrument as a function of t in the manner shown in Figure 11h for a module and ultrasonic instrument combination.

n) Prepare a table as shown in Table 1 and form the smooth curves similar to Figure 11h that can be quickly used to recalibrate the instrument for changing pipe wall thickness.

o) Calibrate the instrument for the 0.5 inch reference block using the nomograms established in Figure 11h and plot the variation of doublet separation a between pulses 1 and 2 in screen divisions (against normalized notch height, h/t, (in percent) in the manner shown in Figure11e for a search unit instrument combination.

p) Continue determining σ versus h/t curves for the nine notches in each of the 0.7 inch, 0.8 inch, 1 inch, and 1.3 inch thick reference blocks.

q) Plot the doublet separations a in screen divisions against normalized heights (in percent) obtained for the notches in the five reference blocks in the manner shown in Figure 11e.

11.7. SIZING APPLICATIONS

11.7.1. Flaw sizing on the basis of relative arrival-time techniques σ and ρ measurements (or absolute arrival-time techniques τ measurements) should be performed as follows.

a) Connect the search unit to the instrument operated in the pitch-catch mode.

b) Calibrate the instrument for the appropriate pipe wall thickness using the nomograms of Figure 11h the table prepared from the nomograms. Check the calibration by observing the initial pulse at t = 0 from the edge of a block and a tip-diffracted signal from the calibration block.

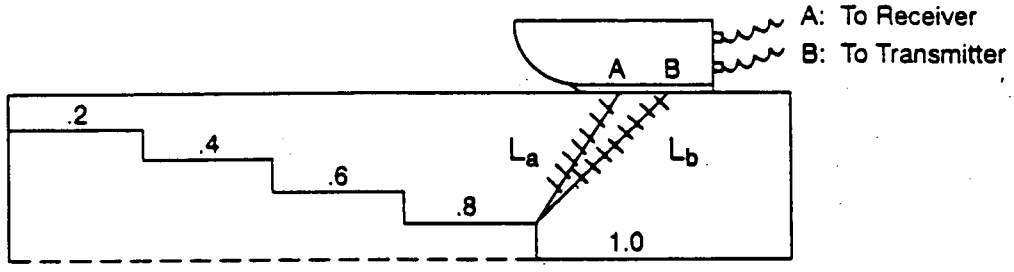
TABLE 1

CALIBRATION DATA SHEET FOR PIPES (INCHES)

Calibration Data Sheet for .40 ≤ t ≤ .80 in

Module No. _____ Operator: _____

Instrument: _____ Date: _____



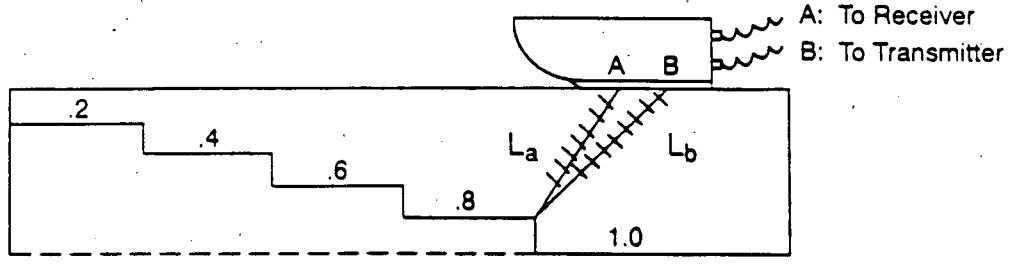
Pipe Thickness t (in)	Set Pulse 1 to %	Instrument Settings					
		Range	Material Cal	Delay	Range	Material Cal	Delay
.80	0	(1)	-		(2.5)	-	
.75	-7		-			-	
.70	-14		-			-	
.65	-23		-			-	
.60	-33		-			-	
.55	-45		-			-	
.50	-60		-			-	
.45	-78		-			-	
.40	-100		-			-	

TABLE 1 (Continued)

Calibration Data Sheet for .80 ≤ t ≤ 1.6 in

Module No. _____ Operator: _____

Instrument: _____ Date: _____



Pipe Thickness t (in)	Set Pulse 1 to %	Instrument Settings					
		Range	Material Cal	Delay	Range	Material Cal	Delay
.80	0	(1)	-		(2.5)	-	
.85	6		-			-	
.90	11		-			-	
.95	16		-			-	
1.00	20		-			-	
1.05	24		-			-	
1.10	27		-			-	
1.15	30		-			-	
1.20	33		-			-	
1.25	36		-			-	
1.30	39		-			-	
1.35	41		-			-	
1.40	43		-			-	
1.45	45		-			-	
1.50	47		-			-	
1.55	48		-			-	
1.60	50		-			-	

c) Using the nine notches in the most appropriate reference block, refresh your memory on the echo-dynamic behavior of the various pulses that are expected from all flaw sizes.

d) Insonify a weld volume void of flaws from both sides of the weld and observe the irrelevant indications, both standing and moving, to the left of midscreen. Adjust the gain so that the average background noise is around 10% of full-screen height (FSH).

e) Scan over the flawed area from the pipe side with broad back-and-forth movements. Look for the mode-converted and creeping-wave pulses to the right of midscreen. If the flaw is unoriented, only two pulses separated by about 2.2 screen divisions and peaking between divisions 5 and 7 (i.e., near midscreen) should be observed. The longer the pulse duration, the deeper the flaw.

f) Scan the area from the weld side with broad back-and-forth movements and, again, look for pulses only to the right of mid-screen. If the pulse patterns are essentially the same when the flaw is viewed from the two sides, then it is likely that the flaw has grown perpendicular to the inside surface (i.e., the flaw is unoriented).

g) Look for a tip-diffracted L-wave pulse to the left of midscreen, from both sides of the weld. If the amplitude of the tip-diffracted pulses observed from the two sides are comparable and smaller than that of the appropriate reference signal, then it is still likely that the flaw is unoriented. The separation, σ, measured between the tip-diffracted L-wave pulse and the mode converted pulse along the pipe from each side of the weld, yields the first two estimates of flaw height according to the appropriate curve in Figure 11h. The more extensive the flaw, the larger the distance between the pulses.

h) Weld crown permitting, move the search unit toward the weld from the pipe side far enough to maximize the tip-diffracted L-wave pulse. The delay time, τ, between the peaked tip-diffracted pulse and the midscreen mark yields a third estimate of height directly on the screen in percent of local wall thickness.

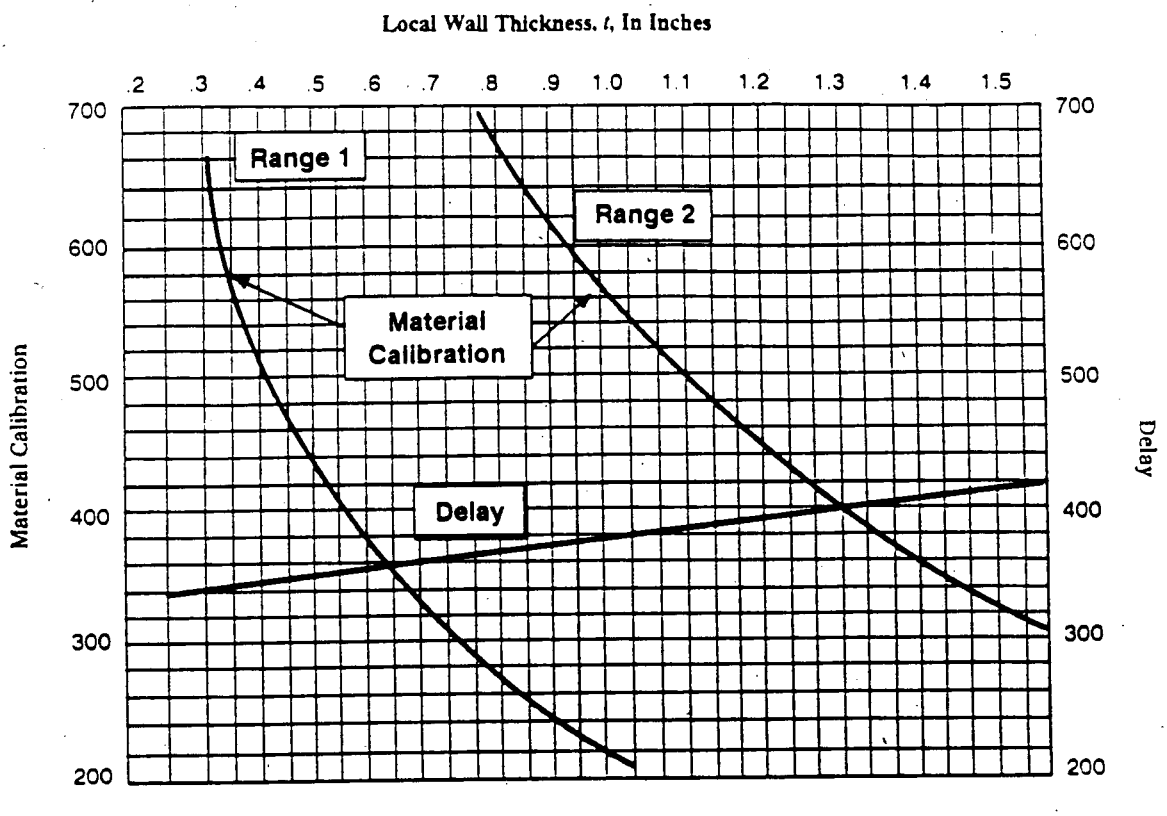


FIGURE 11h

Nomograms Relating the Range, Material Calibration, and Delay Settings of an Instrument Calibrated for σ and τ Measurements to the Local Pipe Wall Thickness

i) If possible, repeat the τ measurement from the weld side to verify that the tip–diffracted pulse peaks at the same screen distance when the flaw is viewed from different directions and the tip signals are equally difficult to obtain from the two sides. This is still more evidence of an unoriented flaw.

j) Follow the peaked tip–diffracted pulse along the length of the flaw and note the maximum height based on both τ and σ measurements. If possible, profile the flaw from both viewing directions.

k) If an L-wave pulse from the crack base is received, then relative arrival-time measurements, ρ, between the tip–diffracted L-wave and the L-wave from the crack base provide additional confirmation of flaw height.

l) Compare the height estimates based on σ, ρ, and τ measurements for consistency. If the two sets of estimates are comparable, report the average of the larger set.

m) Repeat the σ, ρ, and τ measurements if the averages of the two sets of height estimates are significantly different to determine which pulses may have been misclassified or the results of which measurement may have been incorrect. Pulse patterns associated with reference notches of comparable height may help in this decision process (e.g., observing where the mode-converted pulse peaks relative to the tip-diffracted pulse and comparing the amplitude of the mode-converted pulse to that of the inside-surface creeping-wave pulse for various notches).

n) If the patterns observed from the pipe and weld sides are significantly different, then it is likely that the flaw has grown along the weld/base metal fusion line. When viewed from the pipe side, a flaw oriented 30° to the normal for example, gives rise to three associated pulses totally restricted in their travel to the right side of the screen. Peaking at about 9.5 divisions, the last pulse is separated from the other two by 2.5 and 1.5 divisions, respectively.

o) Do not attempt to size a flaw oriented along the fusion line from the pipe side unless the weld crown has been totally removed. Even then, σ and ρ measurements are not valid and τ measurements are difficult to perform on the weak satellite pulse that can be observed from this side.

p) Weld crown permitting, move the search unit toward the oriented flaw from the weld side far enough to maximize the relatively strong tip-diffracted pulse. To avoid underestimating height on the basis of τ measurements performed through the weld with nearly perpendicular incident L-waves, decrease the amplitude of the peaked tip-diffracted pulse by moving the module a bit more toward the weld and read the position of the tip-diffracted pulse against the height scale when the pulse reaches its last maximum peak (modified τ measurements).

nes

SIZING DATA REPORT

PAGE _____ OF _____

System	Component	Procedure	Rev

Instrument Settings
ID # _____

Gain
Coarse _____
Fine _____
Uncal _____

Sweep Circuit
Coarse _____ (Range)
Fine _____
Delay _____
Screen Depth _____

System Check
T&R Normal
Frequency: _____ MHZ
Reject: Off On _____ %
Filter: Off On _____ %
Damping: Off On _____ %
Rep Rate: _____

Cal Standard
ID # _____
Size ____ Sch. ____
Thickness _____
S/S CS _____
Temp _____ F

Search Unit
ID # _____
Type _____
Freq _____ MHZ
Size _____
Angle ____ Mode ____
Measured Angle ____

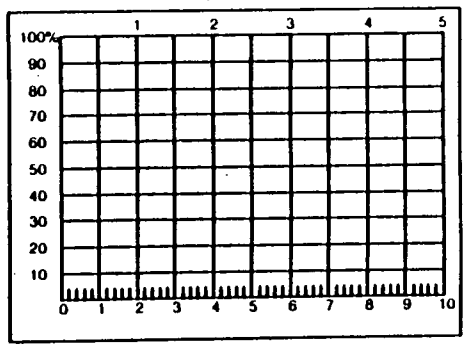
Search Unit Cable
Type _____ Length _____

Couplant
Make _____ Batch # _____

Thermometer
S/N: _____ Cal Due _____

DATE	HOUR	
Reflector	Amplitude % of FSH	Screen Reading In Inches

DAC Plot



Time/Date	/		/		/		/	
Reflector	% FSH	Inches	% FSH	Inches	% FSH	Inches	% FSH	Inches
Initials								

Remarks:

Examiner _____
Level _____ Date _____

Technical Review
Reviewed By _____ Date _____
Reviewed By _____ Date _____

ANII REVIEW

Confidence Level (Score 1–10): _____

EXHIBIT 1

MOST Calibration Sheet

No.: _____

System	Component	Procedure	Rev

Date: **Cal Time:**

Instrument Settings
ID # _____

Decible/Gain
Coarse _____
Fine _____
Uncal _____

Sweep Circuit
Coarse _____ (Range)
Fine _____
Delay _____
Screen Depth _____ In

System Check
☐ T&R ☐ Normal
Frequency: _____ MHZ
Reject: ☐ Off ☐ On _____ %
Filter: ☐ Off ☐ On _____ %
Damping: ☐ Off ☐ On _____ %

Search Unit Cable
Type _____ Length _____
ID # _____

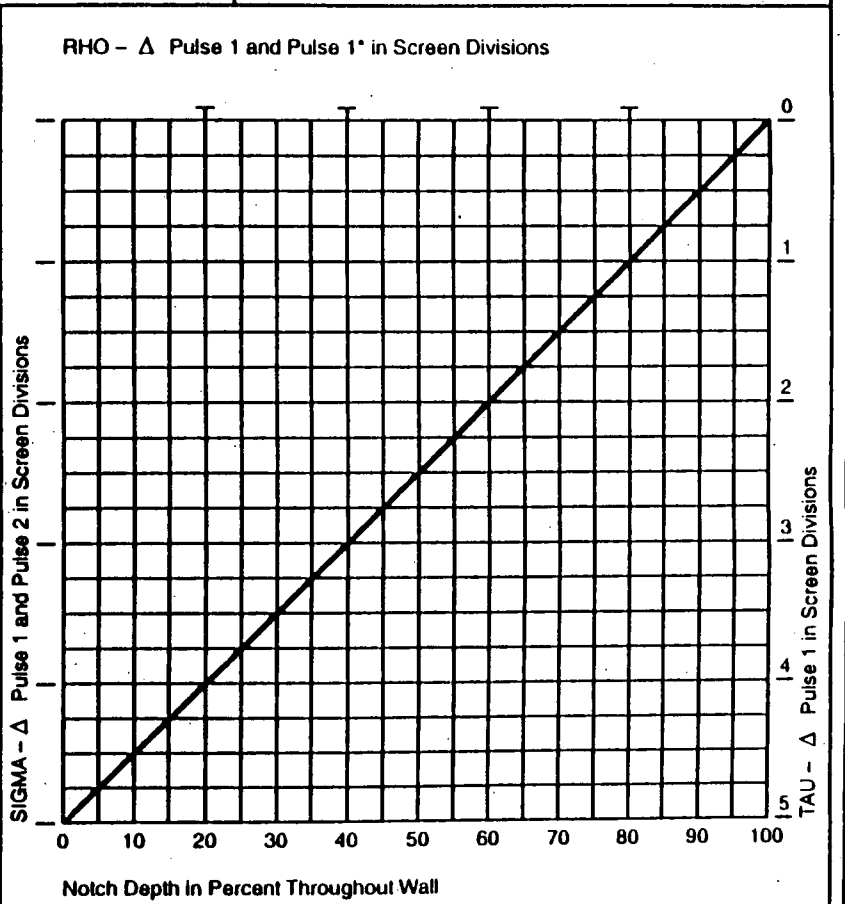
Couplant
Make _____ Batch # _____

Thermometer
S/N: _____

Search Unit
ID # _____
Type _____
Freq _____ MHZ
Size _____
Angle _____ °

Calibration Block
ID # _____
Thickness _____ In
☐ S/S ☐ C/S
☐ _____
Temp _____ ° F

Verified	Initials	Time
TAU		
SIGMA		
RHO		
Verified	Initials	Time
TAU		
SIGMA		
RHO		
Verified	Initials	Time
TAU		
SIGMA		
RHO		



Remarks:

Examiner _____
Level ____ Date _____

Reviewed By _____ Date _____
Reviewed By _____ Date _____

Confidence Level (Score 1–10): _____
Ref Data Sheet
Page ____ of ____

EXHIBIT 2

NES

FLAW SIZING DETERMINATION FORM

PAGE _____ OF _____

Weld #:	Data Sheet #:	Sys:	Date:

Upstream or Downstream from Weld				FLAW SIZING TECHNIQUES																	
Search Unit Location	Imax	L1	L2	30–70–70 Estimate in % "T"	•	High Angle L	•	TAU	•	SiG	•	RHO	•	Full–V Path Y/N	•	Patt	•	Spot	•	Wall Thk.	Final Flaw Size Determination Remaining Ligament Above Flaw	Thru Wall Depth	Confid Level * See Below
1																							
2																							
3																							
4																							
5																							
6																							
7																							
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25																							

* Confidence Level: 1 = High Degree of Confidence
2 = Fair Degree of Confidence
3 = Poor Degree of Confidence

Examiner _____
Level _____ Date _____

Reviewed By _____ Date _____
Reviewed By _____ Date _____

EXHIBIT 3

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

NUCLEAR ENERGY SERVICES, INC.

PROCEDURE QUALIFICATION SHEET

Procedure No.	Revision	Addenda No./ Field Change No.
SP 1225 (NES 83A6083 R.3)	0	N/A

Title: UT Exam of Bolting App. 2

Personnel	U.T. Level/Date
Tim Oddson	II Date: 10/8/93
Scott Larson	III Date: 10/8/93

Calibration Block: CPL 62

Qualification Specimen: CPL 62

(Attach as–built drawing)

Scanning Speed: 2 inches/sec.

Calibration / Sensivitiy: (Complete and attach UT Calibration Data Sheets)

Qualification Results: (Complete and attach UT Data Sheet)

Witness: Scott Larson **UT Level:** III **Date:** 10/8/93

Authorized Inspection Agency: (Optional) RP Valladares **Date:** 10/8/93

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1225

ULTRASONIC EXAMINATION OF BOLTING MATERIAL

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/12/93

Expiration Date 2/11/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 2AUG93
Manager / Technical Support — Date

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 28	0

ULTRASONIC EXAMINATION

OF BOLTING MATERIAL

FOR

H. B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

ject Application	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	Level III	Project Mgr.	Director ISI	
0	Art Pennanen				
1	Ken Birsen				
2	Scott Larson				
3	Scott Larson	Scott Larson 6-8-93	EC Doubleday 6-9-93	EC Doubleday 6-9-93	
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	4/29/92	3	Para. 2.0 Revised last sentence	
		4	Para. 5.1.B rewritten	
		5	Para. 5.2, 5.3 rewritten; deleted 5.2A & 5.2B	
		6	Added * designation to bottom of flow chart	
		7	Para. 6.6 reworded; Para. 6.8 revised 24.8° to 25°	
		8	Para. 7.1.B rewritten; Para. 7.1.E deleted	
		8 & 9	Para. 7.2 reworeded first sentence; 7.3 deleted	
		11	Para. 8.2.A added "the applicable Appendix"	
			Para. 8.2G reworded	
		12	Para. 9.1.C removed typo	
			Para. 9.2.A capitalized "psi"	
		13	Para. 9.2.B and 9.3.C rewritten and added last	
			sentence	
		14	Para. 10.2.D added; 11.3 revised, 11.4 & 11.5 added	
		16	Exhibit 3 revised	
		17,18	Exhibit 4 & 5 added	
		A1,A2, A3	Appendix added	
			Refer to CRA #8349	
2	5/17/93	3	Paragraph 2.0 revised	
		8	7.1.B revised	
		10	Para 8.1.2 d rewritten	
		B1–B4	Add Appendix 2 (CRA No. 8622)	
3	6/4/93	B1	Change title and correct typo per CRA No. 8644	Scott Lam 6-8-93

FORM # NES 206 3/90

1. PURPOSE

The purpose of this procedure is to define the qualification requirements, techniques, recording criteria and equipment for ultrasonic (UT) examination of bolting material.

2. SCOPE

This procedure is limited to manual examinations of ferritic and austenitic bolts or studs in all lengths greater than 2 inches in diameter. Threads may be of any size rolled or cut and the material may be plated or unplated provided the calibration block is of the same fabrication. The examination techniques described herein comply with Reference 3.1 and 3.2 which specify qualification requirements and techniques for detection of flaws in bolting materials. Details of specific bolt or stud configurations to which this procedure may be applied are identified in the applicable attached Appendix.

Appendix 1 – BIT Manway Studs
Appendix 2 – Reactor Coolant Pump Studs

3. REFERENCES

3.1 ASME Boiler & Pressure Vessel Code, Section XI Appendix VI 1986 Edition.

3.2 80A9068 – NES Procedure for Certifying Nondestructive Examination Personnel.

3.3 80A9053 – NES Procedure for Ultrasonic Linearity Verification.

3.4 83A6091 – NES Procedure for PSI/ISI Examination Areas and Volumes.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with Reference 3.1 and 3.2 and shall demonstrate by a qualification test their ability to operate the examination system, collect data and interpret the examination results in accordance with this procedure. Requalification is required for any of the following conditions:

A. When an examiner has not performed the bolting examination technique for which he was originally qualified for 6 months.

B. When there is specific reason to question the ability of the examiner to perform the bolting examination technique.

C. When recertification is required in accordance with Reference 3.2.

4.2 Examiners who fail the qualification test may be retested under the following conditions:

A. When immediate retest is taken, examiners shall demonstrate their ability to detect and locate all test part reflectors without additional guidance.

B. When further training or practice has taken place, a complete repeat of the qualification test is required.

4.3 It is recommended that the examination crews comprise at least two members. At least one member of each examination crew shall have a minimum certification of UT Level II. Evaluations shall be conducted by an examiner with a minimum certification of UT Level II.

4.4 A copy of each examiner's certification summary and eye test shall be maintained on site.

4.5 A copy of each examiner's certification summary and current eye test shall be made available to the plant owner or his agent prior to performing examinations per this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT

The ultrasonic instrument shall be:

A. A pulse echo ultrasonic flaw detection instrument with the following requirements:

1. A current acceptable linearity in accordance with Ref. 3.3

2. Operates within the minimum frequency of 1.0 to 5.0 MHz

3. Equipped with a stepped gain control calibrated in units of 2 dB or less.

B. The applicable Appendix specifies the ultrasonic instrument(s) which are acceptable for use.

5.2 SEARCH UNITS

The search units shall be the same as used for the calibration/qualification. Search unit type, size and frequency shall be specified in the applicable Appendix.

5.3 CABLE

Examinations shall be conducted using cable(s) of the same type, length and number of connectors as that used during the calibration/qualification. See applicable Appendix.

5.4 COUPLANT

Ultragel – or couplant supplied by the plant owner and shall be the same type used for calibration/qualification.

5.5 CALIBRATION BLOCK(S)

A. Calibration blocks shall be selected and provided by the plant owner and shall as a minimum, contain reflectors that meet the requirements of Reference 3.1 of this procedure.

B. Other calibration standards, such as IIW blocks, used for calibrating the screen size, shall be fabricated from either Stainless or Carbon Steel. Selection for use shall depend upon the material to be examined.

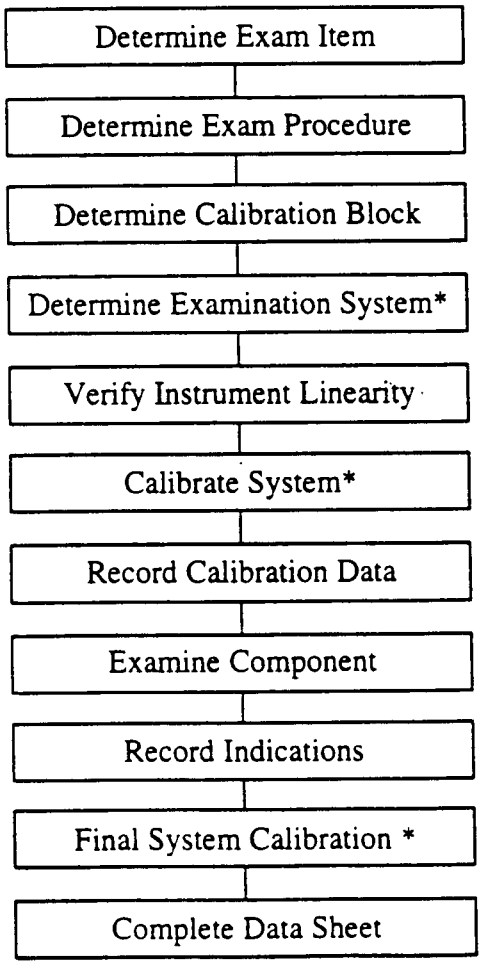
5.6 QUALIFICATION SPECIMEN(S)

Qualification specimens will be provided by the Plant Owner.

6. GENERAL PREREQUISITES

The following flow chart describes a typical examination sequence:

EXAMINATION SEQUENCE



*System = Instrument, Transducer, Wedges (where applicable) and Cable

6.1 The component to be examined shall be identified/determined by the Plant Owner.

6.2 Calibration Blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the Plant Owner, e.g., the examination surface shall be free of foreign matter which may interfere with ultrasonic transmission.

6.4 Each component to be examined shall be identified by the Plant Owner.

> **NOTE:** The examiner shall notify the NES Supervisor or other designated contact individual when surface preparation of scanning surfaces and component identification are not suitable for ultrasonic examination.

6.5 Previous examination data provided by the Plant Owner shall be reviewed by the examiner and the following items should be identified:

A. Obstructions

B. Recordable Indications

C. Previous examination technique

D. Whether bolting was installed or removed

E. Using the above data, the best examination technique to apply.

6.6 Examination technique (e.g., single end scanning, scanning from both ends) shall be as specified in the applicable Appendix.

6.7 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows:

A. Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

B. Screen height and amplitude control linearities should be performed daily (when in use).

6.8 The calibration block surface temperature shall be within 25°F of the component to be examined.

6.9 The "REJECT" control shall be in the "OFF" or "MIN" for linearity checks, calibration and examination.

7. CALIBRATION PROCEDURE

7.1 PREREQUISITES

A. If the calibration block does not contain the reflectors required to perform the calibration techniques identified in this section, or is otherwise incorrect for the component to be examined, the Plant Owner shall be notified and the examination not performed.

B. Calibration shall be performed from the surface of the calibration block in accordance with the examination technique identified in the Appendix.

C. The calibration shall be performed using the same search unit, and cables (length and number of connectors) that are used during the examination.

D. Maximum response from the calibration reflector shall be obtained with the sound beam essentially perpendicular to the axis of and centered on the calibration reflector.

7.2 CALIBRATION

Calibration for specific examinations shall be performed in accordance with the applicable Appendix at the end of this procedure.

8. EXAMINATION PROCEDURE

8.1 PREREQUISITES

NOTE: "SYSTEM" = Instrument, Search Unit and Cable.

8.1.1 System Calibration

Perform the complete ultrasonic examination system calibration, establishing the DAC curve, each day prior to use of the system for examination of those components for which the calibration is applicable, or at any time that any part of the system is changed.

8.1.2 System Calibration Check

a. Verify the system calibration (instrument sensitivity, sweep range calibration) at the following intervals:

1. At the start and finish of examinations for which the calibration applies.
2. At intervals not to exceed 4 hours.
3. With every change of examination personnel.
4. With any change of batteries.
5. If the examiner suspects any malfunction of the UT system.

b. If any point on the DAC curve has decreased 20% or 2 dB in amplitude, all data sheets since the last calibration made and recorded and the affected component(s) reexamined.

c. If any point of the DAC has increased more than 20% or 2dB in amplitude, recorded indications taken since the last valid calibration shall be reexamined with the correct calibration and their values changed on the data sheets. The reason for the changed values shall be noted on the Ultrasonic Calibration Data Sheet. No action is required where no recordable indications exist.

d. If any point on the DAC curve has moved more than 10% of the sweep reading or 5% of full sweep (screen size), whichever is less, correct the sweep range calibration and note the correction on the Ultrasonic Calibration Data Sheet. If recordable reflectors are noted on the data sheets, those data sheets shall be considered invalid. A new calibration shall be established and recorded and the affected component reexamined.

8.2 SCANNING

A. Calibrate the system as described in the applicable Appendix.

B. Locate the component(s) to be examined by use of a sketch or drawing and verify the identification of adjacent components (e.g., valves, pumps, etc.)

C. Verify that the surface finish on the component is similar to that of the calibration block used to calibrate the system and that the examination zone coverage will be to the extent identified in the pre–examination preparations.

D. Scan the component from both ends if it is removed and the geometry permits, however the component shall be scanned from at least one end.

E. Scanning shall be conducted at reference level + 6dB minimum. If excessive thread noise is encountered, the site supervisor shall be notified and may authorize performance of the examination at other than +6dB. Authorization shall be approved by a UT LIII.

F. The entire accessible surface shall be scanned. Where more than one scan path is required to achieve coverage, the search unit shall be overlapped by 50% of a single element dimension.

G. The rate of search unit movement shall be as specified in the applicable Appendix.

H. Record all indications as required by Section 9. If the component is free of recordable indications, this shall be noted on the Ultrasonic Examination Data Sheet (Exhibit 2).

I. Record all obstructions or other conditions that interfere with the examination. Include sufficient information so that a determination/calculations subsequently can be made of the volume not covered, or which receive limited examination coverage.

J. Remove couplant from the examination surface.

9. RECORDING

9.1 PREREQUISITES

A. Indications shall be recorded at reference sensitivity.

B. When using "Double DAC" examination, indications shall be recorded at the appropriate sensitivity pertaining to the specific DAC used at the time of the detection of the indication.

C. Previously recorded geometry shall be verified at the previous recording level (% of DAC) and location. Indications need not be re-plotted, but shall be referenced on the new data sheet by previous data sheet number and date, or by attaching a copy of the previous data sheet to the new data package.

D. The determination that indications are of geometric or metallurgical origin shall be made by one or more of the following methods:

1. Plot and verify the indication as follows:

   a. Record maximum amplitude as a percent of the DAC curve, sweep readings to the reflector, search unit locations and sound beam direction.

   b. Plot location of the reflector at a representative position on a full scale cross section profile drawing, showing the source of the indication and all other relative geometric conditions.

2. Use of other NDE Methods or techniques.

3. Comparison with fabrication drawings.

4. Review of fabricators NDE records.

9.2

A. For PSI or for replaced components, indications, other than thread noise, with amplitudes 20% of DAC or greater, shall be recorded.

B. For ISI (inservice inspection) where geometry has not been previously recorded (as referenced in 9.1.C), indications, other than thread noise, that have amplitudes 50% of DAC or greater shall be recorded.

C. For each geometric indication, other than thread noise, the Indication Report shall consist of a cross sectional plot showing OD profile and geometry in the indication area. On the plot indicate max. amplitude, the location of max. amplitude, depth to the indication, signal to noise ratio and any other pertinent information.

D. Method of Recording Geometric Indications:

Record the maximum amplitude, location, and extent of a geometric indication.

For example: Diameter change, 100% of DAC, 360°.

9.3 RECORDING CRITERIA FOR NON–GEOMETRIC INDICATIONS

A. Any indication suspected to be from a crack or any indication emanating from the thread noise with a signal to noise ratio equal to or greater than 2 to 1.

B. Indications which are determined to be non–service induced (e.g., fabrication induced flaws) and are not of geometrical or metallurgical origin shall be recorded if they meet or exceed 50% of DAC.

C. For each non–geometric indication, the Indication Report shall consist of a cross sectional plot showing the location of nongeometric reflectors. On the plot indicate maximum amplitude, search unit location at maximum amplitude, depth to the indication and any other pertinent information.

D. The examiner shall provide any additional information that will aid in dispositioning the indications.

9.4 ACCEPTANCE CRITERIA

Acceptance of indications shall be determined by the requirements of ASME Section XI, IWA–3000, or other referencing code sections as applicable.

10. EXAMINATION RECORDS

10.1 NES shall be responsible for submitting to the Plant Owner or his agent, a complete set of examination records.

10.2 Exhibits 1, 2 and 3 shall be used to record the examiners performance qualification test.

A. The Exhibits shall be identified "Qualification Test".

B. The test part shall be identified on the Exhibits.

C. The Level III examiner who conducts the test shall identify any limitations or restrictions and sign the Exhibits.

D. Where appropriate, ANII approval shall be documented.

10.3 Exhibit 1 shall be completed by the examiners to the extent possible, at the time of calibration. Where the sheet cannot be completed at the time of calibration, the sheet shall be completed promptly after the last examination that uses that calibration.

10.4 Exhibits 2 and 3 shall be completed by the examiners as required.

10.5 The examiner(s) shall sign the completed data sheet, noting applicable NDE Certification Level(s).

10.6 NES record retention shall be limited to the time until the Final Report and/or the examination data is delivered to the Plant Owner or his agent.

11. ATTACHMENTS

11.1 Exhibit 1 – Ultrasonic Calibration Data Sheet

11.2 Exhibit 2 – Ultrasonic Examination Data Sheet

11.3 Exhibit 3 – Ultrasonic Indication Data Sheet for Bolting

11.4 Exhibit 4 – Procedure Qualification Sheet

11.5 Exhibit 5 – Personnel Performance Qualification Sheet

DATA SHEET NO. _____
PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____
REV. _____
CHANGE NO. _____

INSTRUMENT
Model _____
Serial No. _____
Sweep Length _____ Delay _____
Range _____
Gain (coarse) _____ dB
Gain (fine) _____ dB
Reference Sensitivity _____ dB
Remarks: _____

SEARCH UNIT
Serial No. _____
Size _____
Frequency _____ MHz
Mode _____
Nom. Angle _____ °
Measured Angle _____ °
Cable Type _____
Cable Length _____
Remarks: _____

CALIBRATION BLOCK
No. _____
"T" _____ Dia. _____
Temperature _____ ° F
Thermometer S/N _____

CALIBRATION
0° ☐ Axial ☐ Circ. ☐
Metal Path ☐ Depth ☐
Each Major Screen Div. = _____
Remarks _____

COUPLANT
Brand _____
Batch No. _____

VERTICAL LINEARITY

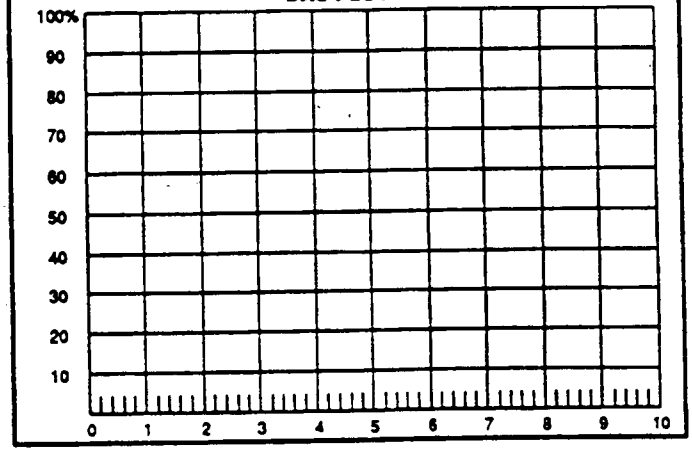
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	
80	-12	
40	+6	
20	+12	

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	

REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

NES 940 - REV. 1

ULTRASONIC CALIBRATION DATA SHEET
EXHIBIT 1

DATA SHEET NO. ____________

PAGE ______ OF ________

EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM ____________

ISO/DWG. NO. ________ REV. ______

THERMOMETER S/N ____________

COMPONENT TEMP. ________ ° F

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______ ° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:

1 ____________ LEVEL ______ DATE ______

2 ____________ LEVEL ______ DATE ______

REVIEWERS:

1 ____________ LEVEL ______ DATE ______

2 ____________ LEVEL ______ DATE ______

3 ____________ LEVEL ______ DATE ______

NES 940 - REV. 1

nes NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC EXAMINATION SHEET

EXHIBIT 2

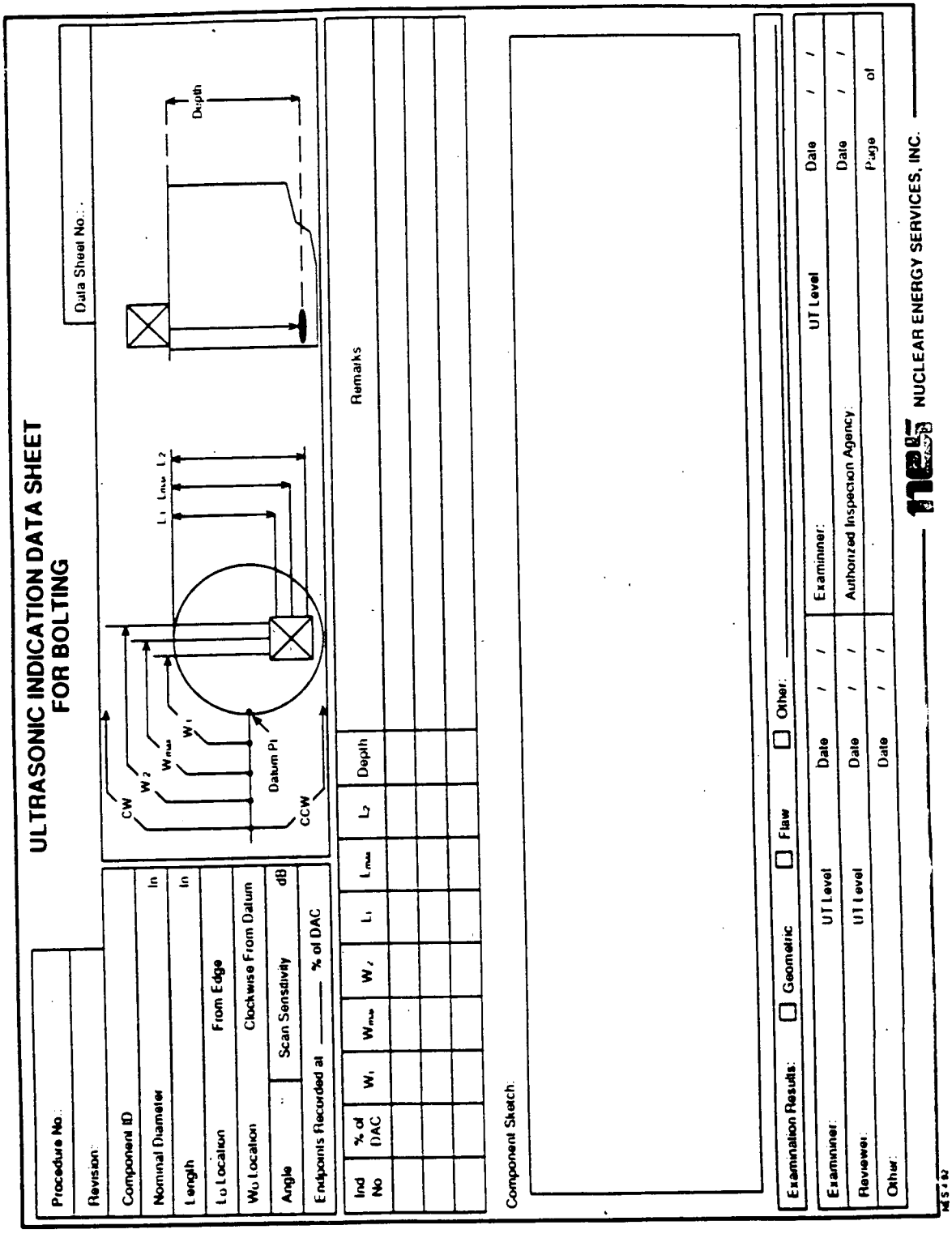

ULTRASONIC INDICATION DATA SHEET
FOR BOLTING
Data Sheet No.:
Procedure No.:
Revision:
Component ID
Nominal Diameter
Length
Lo Location
Wo Location
Angle
Endpoints Recorded at ____ % of DAC
In
In
From Edge
Clockwise From Datum
Scan Sensitivity
dB
Depth
L1 Lmax L2
W1
Wmax
W2
Datum Pt
CW
CCW
Remarks
Ind No
% of DAC
W1
Wmax
W2
L1
Lmax
L2
Depth
Component Sketch:
Examination Results:
Geometric
Flaw
Other:
Examiner:
UT Level
Date
Examiner:
UT Level
Date
Reviewer:
UT Level
Date
Other:
Date
Examiner:
Authorized Inspection Agency:
Page
of
NUCLEAR ENERGY SERVICES, INC.

EXHIBIT 3

NUCLEAR ENERGY SERVICES, INC.

PROCEDURE QUALIFICATION SHEET

Procedure No.	Revision	Field Change No.

Title:	

Personnel	U.T. Level/Date
	Date: / /
	Date: / /

Calibration Block: _____

Qualification Specimen: _____
(Attach as-built drawing)

Scanning Speed: _____

Calibration / Sensivitiy: (Complete and attach UT Calibration Data Sheets)

Qualification Results: (Complete and attach UT Data Sheet)

Witness: _____ UT Level: _____ Date: / /

Authorized Inspection Agency:(Optional) _____ Date: / /

EXHIBIT 4

NUCLEAR ENERGY SERVICES, INC.

PERSONNEL PERFORMANCE QUALIFICATION SHEET

Procedure No.	Revision	Field Change No.

Title:

Personnel	Certification Level
	Date: / /
	Date: / /

Component ID: _____

Test Results: Pass ☐ Fail ☐

Limitations/Restrictions: No ☐ Yes ☐ *(See Below)*

_____

_____

_____

_____

Witness: _____ UT Level: _____ Date: / /

Authorized Inspection Agency:(Optional) _____ Date: / /

EXHIBIT 5

APPENDIX 1
QUALIFICATION DETAILS FOR
H.B. ROBINSON BIT MANWAY STUDS

A. GENERAL

A.1 This appendix specifies the calibration sequence and additional examination details for the 13.5″ long Boron Injection Tank (BIT) studs.

A.2 The examination uses straight beam (0°), longitudinal wave, direct contact techniques. No wedges, shoes, rotating, revolving or scanning mechanisms are used.

B. EQUIPMENT

B.1 Ultrasonic Instrument

Manufacturer:	Krautkramer–Branson
Model:	USK–7

B.2 Search Unit

Manufacturer:	K–B Aerotech
Model:	ALPHA
Size:	1/4″ diameter
Frequency:	10 MHz

B.3 Coaxial Cable

Type:	RG–174/U
Length:	Equal to or less than 6 ft.
Number of Connectors:	1 microdot and 1 BNC

B.4 Calibration Block

See attached drawing.

C. CALIBRATION/EXAMINATION

C.1 Using a block of known thickness and similar material, establish a 14 inch calibrated screen.

C.2 Obtain a reflection from Notch "A" that represents half the length of the calibration stud. Maximize this response and set the amplitude to 50% FSH. Mark the amplitude on the CRT.

C.3 Maximize the response from Notch "B" from the surface representing approximately 13" of metal path (MP). If the maximum response from this notch is not at least 20% FSH, then increase the sensitivity (gain) to set this signal to 20% FSH and mark its amplitude on the CRT.

C.4 Connect the points on the CRT screen marked in C2 and C3 above. This is primary reference sensitivity.

C.5 Check the response from notch "B" from the surface representing approximately .5" MP.

NOTE: The response from this notch at this metal path may be a pattern of multiples. Care should be taken during examination to accurately determine the depth of indications occurring near the front surface signal.

C.6 Upon completion of calibration record the required instrument settings on the Calibration Data Sheet.

C.7 Scanning speed shall not exceed 2" per second.

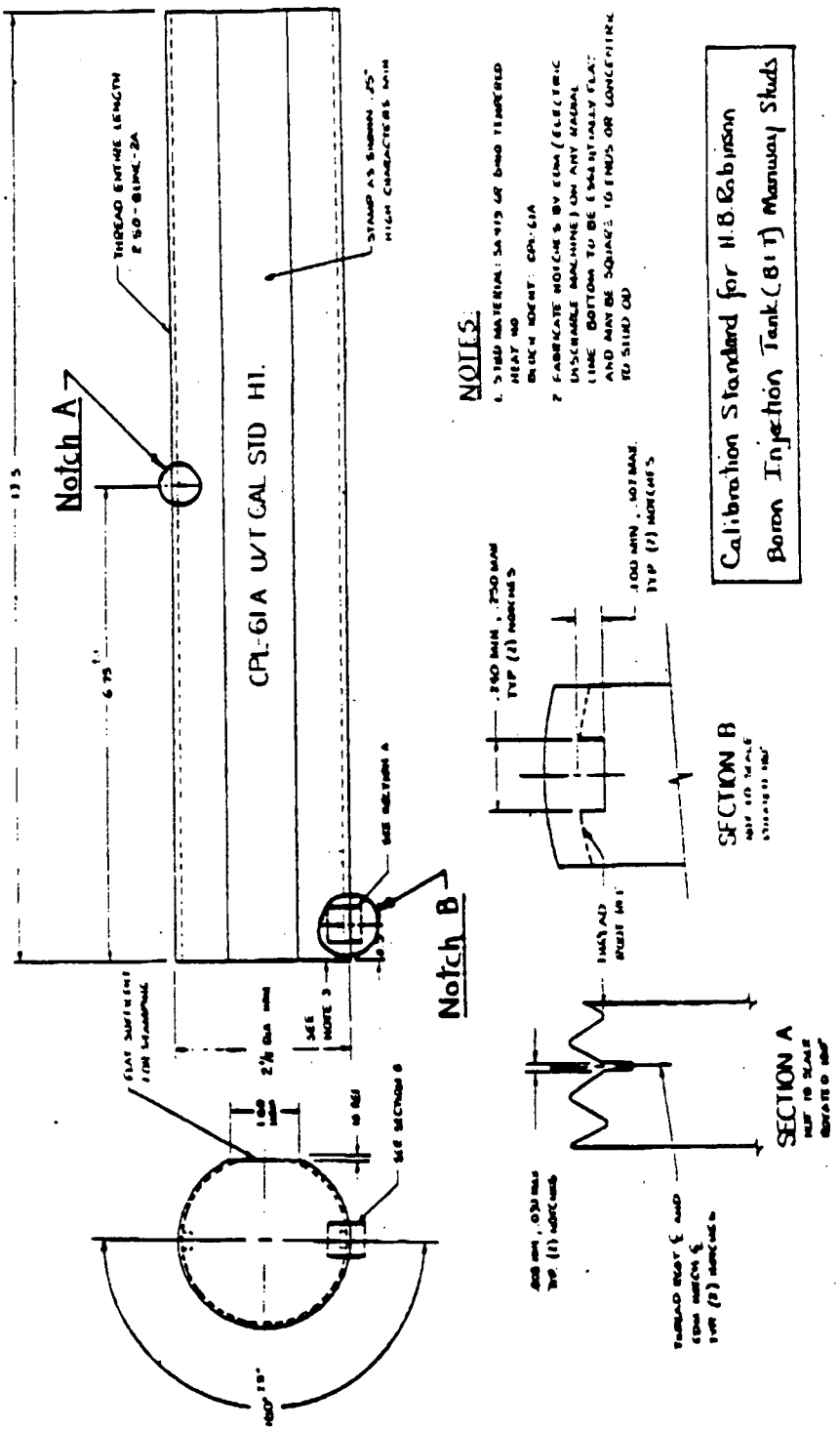

Notch A
Notch B
CPL-61A U/T CAL STD H1.
NOTES:
SECTION B
SECTION A
Calibration Standard for H.B.Robinson
Boron Injection Tank (BIT) Manway Studs

FIGURE 1

1

APPENDIX 2
QUALIFICATION DETAILS FOR H.B. ROBINSON REACTOR COOLANT PUMP STUDS 3

Calibration/Qualification Details for Reactor Coolant Pump (RCP) studs.

A. GENERAL

A.1 This appendix specifies the calibration sequence and additional examination details for the RCP studs.

A.2 The examination is performed from the RCP bore (heater hole) using a bore type examination probe containing two 70° nominal shear wave search units to examine the thread and shank areas and a 90° surface wave to examine the ID surface of the stud.

B. EQUIPMENT

B.1 Ultrasonic Instrument

1. Krautkramer–Branson, USL series or USK series

2. Stavely, 136 or 137 models

B.2 Search Unit

Manufacturer:	Technisonic
Model:	Bore Probe
Frequency	4 MHz to 8 MHz

3

B.3 Coaxial Cable

Type:	RG–174/U
Length:	12 ft. or less per search unit
Number of Connectors:	1 microdot and 3 BNC maximum per search unit

B.4 Calibration Block

CPL–62. See attached drawing.

C. CALIBRATION/EXAMINATION

C.1 70° Nominal Shear Wave

1. With the bore probe inserted in the stud, maximize the response from the OD Notch. Refer to Figure B1.

2. Adjust the sweep controls to position the Initial Pulse at screen division 0 on the CRT and the maximized response from the OD notch at screen division 8 on the CRT.

3. Adjust the instrument gain controls to place the maximized response from the OD notch to 80% FSH. This establishes **Reference Sensitivity**.

4. Upon completion of calibration, record the required instrument settings and calibration data on the Calibration Data Sheet.

5. Scanning speed shall not exceed 2" per second.

6. Scanning may be performed from one end of the stud when both 70° shear wave search units are activated or scanning may be performed from both ends (when accessible) with only one search unit activated.

7. Scanning shall be sufficient to examine the entire thread and shank areas.

C.2 90° Nominal Surface Wave

1. With the bore probe inserted in the stud bore from the top end of the stud maximize the response from the first ID notch. Refer to Figure B1.

2. Adjust the sweep controls to position the Initial Pulse at screen division 0 on the CRT and the maximized response from the ID notch at screen division 3 on the CRT.

3. Adjust the instrument gain controls to pace the maximized response from the ID notch to 80% FSH. This establishes **Reference Sensitivity**.

4. Upon completion of calibration, record the required instrument settings and calibration data on the Calibration Data Sheet.

5. Scanning speed shall not exceed 2" per second.

6. Scanning shall be sufficient to examine the entire heater hole ID surface.

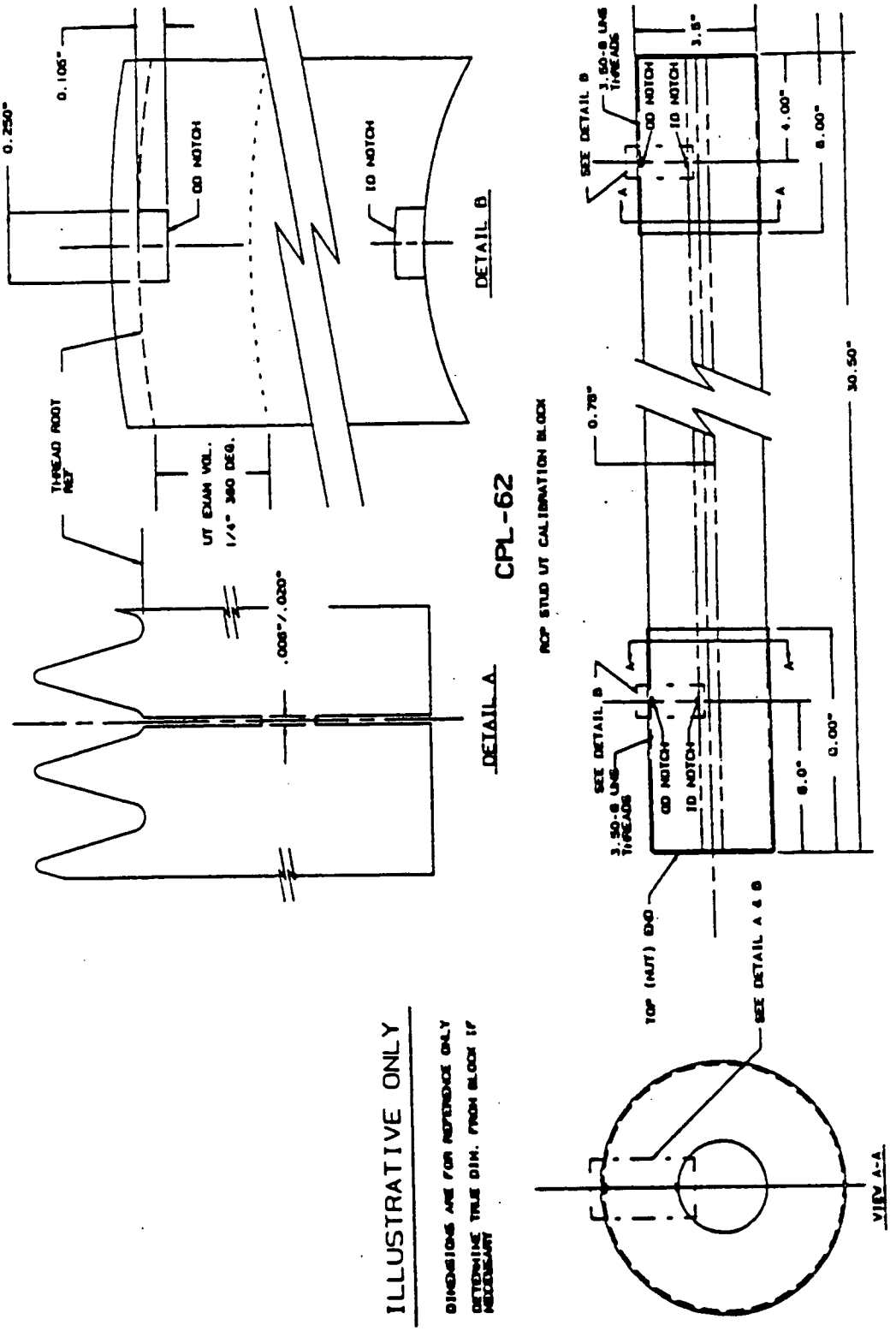

0.250"
0.105"
OD NOTCH
ID NOTCH
DETAIL B
THREAD ROOT REF
UT EXAM VOL. 1/4" 360 DEG.
.000"/.020"
DETAIL A
CPL-62
ROP STUD UT CALIBRATION BLOCK
SEE DETAIL B
3.50-8 UNS THREADS
3.5"
4.00"
8.00"
0.78"
30.50"
6.0"
0.00"
TOP (NUT) END
SEE DETAIL A & B
VIEW A-A
ILLUSTRATIVE ONLY
DIMENSIONS ARE FOR REFERENCE ONLY
DETERMINE TRUE DIM. FROM BLOCK IF NECESSARY

FIGURE B1

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

FOR INFORMATION ONLY

SPECIAL PROCEDURE

SP-1226

MANUAL ULTRASONIC EXAMINATION OF WROUGHT STAINLESS STEEL REACTOR COOLANT PIPE WELDS AND PRIMARY LOOP CAST STAINLESS STEEL ELBOW LONGITUDINAL WELDS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/10/93

Expiration Date 2/10/94

RECOMMENDED BY: _____ 7/23/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 24AUG92
Manager, Technical Support — Date

CONTROLLED RECIPIENT ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 19	0

MANUAL ULTRASONIC EXAMINATION OF WROUGHT STAINLESS STEEL REACTOR COOLANT PIPE WELDS AND PRIMARY LOOP CAST STAINLESS STEEL ELBOW LONGITUDINAL WELDS

FOR

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON UNIT NO. 2

Project Application	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	UT Level III	Project Manager	Director, ISI	
0	Scott Larson				
1	Scott Larson	6-8-93	6-8-93	6-8-93	
2					
3					
4					
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11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6166

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	6/4/93	3,4	Para. 1.4 and 2.5 change Unit 1 and No. 1 to Unit 2	Scott Lauer 6-8-93
			and No. 2 per CRA No. 8645	

FORM # NES 206 3/90

1. SCOPE

1.1 This procedure defines the requirements for:

A) Manual ultrasonic examination of wrought stainless steel reactor coolant pipe welds in the sizes of 27.5", 29", and 31" (inside diameter), having a thickness range of 2.1" to 3.45".

B) Manual ultrasonic examination of static cast stainless steel reactor coolant loop elbow longitudinal weld seams having a thickness range of 2.75" to 4.5".

1.2 Examinations in accordance with this procedure are intended to satisfy volumetric examination requirements based on Section XI of the ASME Boiler and Pressure Vessel Code 1986 Edition, including Section XI, IWA2240, when dictated due to code omissions and to implement upgraded technology.

1.3 Procedure technical content and recommendations are based on WCAP-11778 "Demonstration of Flaw Detection and Characterization Capabilities for Ultrasonic Examination of Main Coolant Loop Welds," March 1988, prepared for the Westinghouse Owners Group.

1.4 The H. B. Robinson Unit 2 Examination Program Plan is considered part of this procedure and is to be used as applicable.

2. GENERAL REQUIREMENTS

2.1 Personnel performing examinations to this procedure shall be certified to at least LEVEL II for ultrasonic examinations, based on a written procedure prepared in accordance with SNT-TC-1A, as may be modified by Section XI of the ASME Boiler and Pressure Vessel Code 1986 Edition. Personnel certified to any LEVEL for ultrasonic examinations may be employed as assistants. However, responsibility for satisfactory examination, results and documentation shall be solely that of the Level-II or III and he shall co-sign data sheets provided by such assistants.

2.2 Ultrasonic flaw detection instruments shall be of the pulse echo type with an A-Scan presentation and shall be qualified to the requirements of Carolina Power and Light at the

beginning and end of each period of extended use. Qualifications may be valid for a period not to exceed three months. Local pre-amplification may be used with the basic flaw detection unit.

The following test instrumentation is recommended:

Flaw Detectors

1) Panametrics EPOCH 2002 with or without 200 KHz modified bandwidth filtration

2) Krautkramer USK Series

3) Krautkramer USL Series

4) Stavley (Sonic) 136

5) Sonic Mark 1, 600 V pulser modified

Local Amplification

1) Panametrics Model 5676

2.3 Piezoelectric transducers shall be in accordance with TABLE 1 and shall be capable of providing the applicable calibration.

2.4 Couplant shall be Echogel, Sonotrace, Ultragel or Glycerin that is certified as containing not more than 1% by weight of residual sulphur and halogens.

2.5 The item to be examined, including the required extent of adjacent volume to be examined, shall be a defined in the H. B. Robinson No. 2 Examination Program Plan. This information shall be provided to the examiner assigned to conduct the examination. Examination of the required volume shall be to the maximum extent practical. Any area which precludes 100% coverage shall be recorded. Ref. 5.1.2.

2.6 Transducer scan surfaces including the weld crown, shall be essentially free of dirt, spatter, paint, coatings and irregularities that impair smooth uninterrupted contact of the search unit and coupling of the sound beam into the material.

2.6.1 Surface condition, and access support (i.e., scaffolds, lighting, etc.) if required shall be the responsibility of the utility.

2.7 CALIBRATION/REFERENCE STANDARDS

2.7.1 Calibration/Reference standards for examination of wrought main coolant pipe and cast elbow long seams are identified as CPL-RCP CSS Elbow 1 and CPL RCP WSS 01.

2.7.2 The temperature difference between the surface of the block on which calibration is accomplished and the surface of the item to be examined shall not exceed 25°F.

3. SYSTEM CALIBRATION

3.1 Prior to and after conducting examinations, the complete system to be utilized shall be calibrated on the applicable calibration block for the examinations to be conducted. The system is defined as; the ultrasonic instrument (and battery pack if applicable), cable(s), transducer, couplant, and any other apparatus, instrument or circuit employed between the instrument and the calibration block surface. Once calibration has been established any change to any part of the system will require at least a verification of the calibration.

3.2 Any controls which affect the instrument linearity (i.e. reject or clipping) shall be in the off or minimum position for linearity checks, calibration and calibration checks.

3.3 Sweep range calibration for angle beam examinations shall be sufficiently long so as to allow examination of the entire required volume by a half-vee path from each side of the weld. The entire volume required to be examined shall be covered by at least 2 sound beam directions (parallel and perpendicular), from each side of the weld (Fig. 1).

3.3.1 Sweep for angle beam examinations (45L, 45S, and 60S) shall be calibrated to provide equally spaced increments of the appropriate reference reflectors.

3.3.2 For wrought main coolant loop piping and cast elbow long seam welds, sweep range calibration shall be such that the notch response (half-vee) occupies no more than 70% of the sweep.

3.4 For wrought stainless steel primary loop piping, sensitivity calibration for reflectors transverse to and parallel to the weld shall be conducted on reference standard CPL RCP WSS 01 as follows:

3.4.1 The slope of the DAC shall be established with the peaked signal from the 1/4 T hole set to 80% FSH and connecting the resulting peaks from the 1/2 T and 3/4 T holes with a curved line. Adjust the 3/4 T hole response to 80% FSH and draw the primary reference DAC curve as a line parallel to the line previously drawn. The line shall extend through the 80% reference point out in the sweep until it intersects a vertical major graticule representing 1 1/4 T or 100% sweep.

3.4.2 Reference points of 50% and 20% DAC shall also be established on the screen by decreasing each DAC curve reference point by 6dB and 8dB, respectively. The resulting 50% and 20% points shall be connected by curved lines drawn on the screen. To minimize screen clutter, lines connecting 50% points may be deleted, providing the points are clearly marked.

3.4.3 Note the amplitude (difference in dB to the reference curve) and peak sweep location of the 10% T ID surface notch.

3.4.4 Record the 1/4 T, 1/2 T, 3/4 T and 10% ID notch peak, and minimum/maximum 50% DAC sweep positions and corresponding surface stand–off dimensions by transducer movement toward and away from the reflectors. Record instrument control settings, transducer data, and reference standard data on the Examination Data Sheet, figure 2.

3.5 For cast elbow long seam welds, sensitivity calibrations for reflectors transverse to and parallel to the weld seam shall be conducted on reference standard CPL–RCP CSS ELBOW 01 as follows:

3.5.1 Adjust instrument gain and sweep controls so that the peak response from the 10% T ID surface notch is set at 70% sweep and 80% FSH. Mark the peak response point on the screen. Without moving the transducer, decrease the gain by a value of 6dB and mark this response point on the screen. Decrease the gain by an additional 8dB and mark the point on the screen. Obtain the peak response from the 3/4 T hole and mark the sweep position on the screen. Draw one straight horizontal line at 80% screen starting one major screen division to the left of the 3/4 T hole sweep position, extending the line to 100% sweep. Draw a second line of the same length across the screen at the height of the –6dB point. Draw a third line of equal length at the height

of the –14 dB point. The three lines represent reference level, 50% DAC and 20% DAC, respectively.

NOTE: For cast pipe calibrations, certain instrument control adjustments may help to maximize the signal to noise ratio of the notch response. These include: rep rate, frequency, or damping (pulse tuning). Also, investigate to determine if differences in response or noise level can be noticed with search unit frequencies of 0.75 vs. 1.0 MHz.

3.5.2 Record the 10% T ID notch peak, and minimum/maximum 50% DAC sweep positions and corresponding surface stand–off dimensions by moving the transducer toward and away from the peak notch response position. Record instrument control settings, transducer data, and reference standard data on the Ultrasonic Calibration Data Sheet, Figure 2.

3.5.3 Scan the 10% T notch in the reference standard and observe the notch dynamic response with respect to the material noise.

3.6 Straight beam sensitivity calibration for welds in piping and elbow fittings can be performed in addition to required angle beam calibrations and shall be as follows:

3.6.1 Adjust the sweep control so that the 1/4 T and 3/4 T holes are displayed within the first 6 major screen divisions. The signal amplitude from the 1/4 T hole shall be set at 80% of full screen. Mark the amplitudes of both the 1/4 and 3/4 T holes to establish the DAC. Note the backwall response at reference sensitivity.

3.6.2 Record the 1/4 T hole, 3/4 T hole, and backwall amplitudes and sweep positions, instrument control settings, transducer data, and reference standard data on the Examination Data Sheet, figure 2.

4. SYSTEM CALIBRATION VERIFICATION

Calibration shall be verified at the beginning of each day of examination, and at the end of examinations for which calibration is applicable or every four hours, whichever is less, and with any change in examination personnel.

4.1 A DECREASE in sensitivity of more than 2dB shall require recalibration and re–examination of all items examined since the previous acceptable calibration or check.

An INCREASE in sensitivity of more than 2 DB shall require recalibration and re-examination and data correction of all indications recorded since the previous acceptable calibration or check.

If any point on the DAC curve has moved on the sweep line more than 10% of the sweep division reading, correct the sweep range calibration and note the correction in the examination record. If recordable reflectors are on the data sheets, this data shall be voided, a new calibration established, and areas relative to the voided data shall be re-examined.

5. EXAMINATION

5.1 EXTENT OF EXAMINATIONS

5.1.1 Examinations for reflectors parallel and transverse to the weld shall be conducted to achieve coverage of the required volume to the extent described in section 3.3 and figure 1, utilizing 45 degree beam angles. For main loop piping, the 60 degree beam angle can be used to accomplish a more complete interrogation of certain areas of the examination volume which may be inaccessible due to weld crown or taper geometry.

5.1.2 The extent that cannot be examined due to physical restriction shall be recorded. A sketch supporting the examiners conclusion is required.

5.2 Rate of search unit movement shall not exceed 6" per second.

5.3 Scanning sensitivity shall be at least twice the primary reference sensitivity. (+6dB) Alternatively, the examiner may adjust the scan sensitivity so that material noise averages 10% of full screen. In this case, valid indications identified according to 6.1.1 shall still be investigated and recorded, if necessary according to paragraph 7.0.

5.4 Liberal use of couplant is required, especially for the dual element L wave units used on elbow exams. Lack of couplant may result in reduced detection rates while still maintaining a continuous noise level on the screen.

5.5 Angle Beam – Reflectors Parallel to the Weld

5.5.1 The scan pattern shall start with the search unit transmitting an angle beam perpendicular to and towards the weld. The search unit shall be moved towards and

away from the weld such that a necessary amount of the beam path passes through the maximum accessible volume of weld and base metal to be examined. Search unit movement shall be such that the beam covers at least 50 percent of the area covered by the previous adjacent pass. The weld and required amount of adjacent base metal is to be fully scanned by this method. Examinations shall be accomplished from both sides of the weld.

5.6 ANGLE BEAM – REFLECTORS TRANSVERSE TO THE WELD

5.6.1 This examination is to be accomplished utilizing 45 or 60 angles only where satisfactory sound beam coupling into the weld can be achieved and maintained. Crowns should be flat for at least 90% of width.

5.6.2 The search unit shall be placed on one edge of the weld directing the angle beam into the material parallel to the weld axis. From this position, the search unit shall be moved parallel to the weld and indexed toward the opposite side such that the next scan will cover at least 50 percent of the area covered by the previous adjacent scan. Parallel scans shall be repeated in this manner until the length and width of the required volume under this surface has been scanned; and then repeated in the opposite direction.

6. INTERPRETATION AND INVESTIGATION

6.1 The examiner shall interpret all indications that equal or exceed 20% of the primary reference DAC such that he can assess their source and cause in terms of their being either valid or non–valid. Indications from or near the root of welds may require other aids.

6.1.1 Valid indications are reflectors caused by flaws, such as cracks, lack of penetration or lack of fusion, and embedded volumetrictype discontinuities. Indications considered non valid include those due to material grain noise, beam redirection and mode conversion, weld or buttering interface, and geometric reflectors such as root counterbore. For cast elbow weld examinations, valid reflectors should appear distinct from material noise by an amplitude ratio of 2:1 with echodynamic or "travel" observed while scanning toward and away from the reflector. Such reflectors should have a measurable length to be considered a recordable indication.

6.2 Valid indications that equal or exceed 20% of primary reference DAC shall be investigated by the examiner, in terms of the recording requirements of 7.0.

7. INDICATIONS TO BE RECORDED

7.1 Prior to recording indications that require dimensioning, complete primary reference calibration, including linearity check and distance from scribe/ref line used to determine beam spread measurements shall be checked.

7.2 Valid flaw indications which provide a response equal to or greater than 50% of primary reference DAC shall be considered as "Recordable Indication" as noted as RI.

7.2.1 For each such indication, length, peak amplitude, sweep position, and search unit location and direction shall be recorded. The indication shall also be dimensioned to record, as a minimum, sweep positions and search unit locations representing minimum and maximum 50% DAC points, perpendicular to the length axis of the indication. Parallel to the length axis, the bounding 50% DAC and 20% DAC points shall be recorded.

7.2.2 Geometric reflectors which provide a response equal to or greater than 50% of primary reference DAC shall be recorded on an Indication Report Sheet Figure 4. As a minimum: length, peak amplitude, peak sweep position, peak inches to reference, search unit location and direction and scanning sides thickness shall be recorded.

7.3 Valid flaw indications which provide a response of 20 to 50% primary reference DAC shall be considered as "Non Recordable Indication" and noted as NRI.

7.4 Non-valid indications and the absence of valid indications shall be considered as "No Indications" as noted as NI.

8. POST CLEANING

8.1 Examined areas shall be dry wiped to remove excess wet couplant, if necessary.

9. EXAMINATION RECORDS

9.1 NES shall be responsible for submitting to the Plant Owner, or his Agent, a complete set of examination records.

9.2 Figure 2 shall be completed by examiners at the time of calibration. Figure 3 and 4 shall be completed by the examiner(s) as required.

9.3 The Examiners shall sign the completed data sheet(s), noting applicable NDE Certification Level(s).

9.4 NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

ULTRASONIC SEARCH UNITS

	Element Size	Configuration	Frequency MHz	Angle/Mode
Wrought SS (1)	1.0" dia max or 1.0 sq. in. max	Single Element	2.25	45°S/60S (3)
Main Coolant (2)	1.0" dia	Dual Element	1.0 – 2.25	45L/45S
Pipe	1.0" dia max	Single Element	1.0 – 2.25	0°
Cast SS Elbow (4)	1.0" dia	Dual Element	0.75/1.0	45L
Long Seams	1.0" dia max.	Single Element	1.0 – 2.25	0°

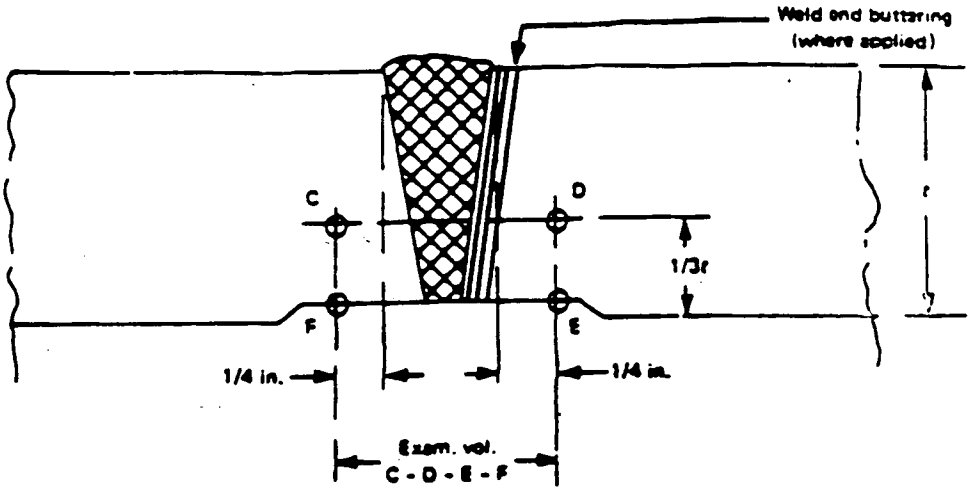
(1) First choice for detection/amplitude based sizing

(2) For supplemental sizing techniques

(3) 60 is not required with 45 examinations, but may be used in lieu of 45 angle or to cover examination volumes determined inaccessible to the 45 beam.

(4) KBA Alpha series or equivalent recommended.

TABLE 1 – ULTRASONIC SEARCH UNITS



REF: ASME CODE SECTION XI, 1986 Ed. Fig. IWB–2500–8

FIGURE 1 – RCP, ELBOW WELD EXAM VOLUME

PLANT/UNIT _____
DATA SHEET NO. _____
PAGE _____ OF _____

CALIBRATION DATA SHEET

PROC. NO. _____
REV./CHANGE NO. _____

INSTRUMENT SETTINGS

Mfg./Model _____
Serial No. _____
Linearity Due _____
Sweep Length _____ Delay _____
Pulse Lgth./Damping _____
Freq. _____ Rep. Rate _____
Filter _____ Video _____ Jack _____
DEC/Gate Switch _____ Range _____
Mode Select _____ Reject _____
Gain (coarse) _____
Gain (fine) _____
Scan Sensitivity _____

SEARCH UNIT

Scan Angle _____ ° Mode _____
Fixturing _____
Fixturing Serial No. _____
Style or Type No. _____
Size & Shape _____
Frequency _____ MHz
Serial No./Brand _____
_____
Measured Angle _____ °
Cable Type & Length _____
_____
Couplant Brand _____
Couplant Batch _____

CALIBRATION BLOCK

Calibration Block Number
_____
Fabrication Number
_____
Block Temp. _____ ° F
Thermometer S/N _____
Cal. Blk. "T" _____ inches
CRT Calibrated in _____
_____
Each Major Screen Div. = _____
Remarks _____

INSTR. LINEARITY CAL.

AMPLITUDE

	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5					

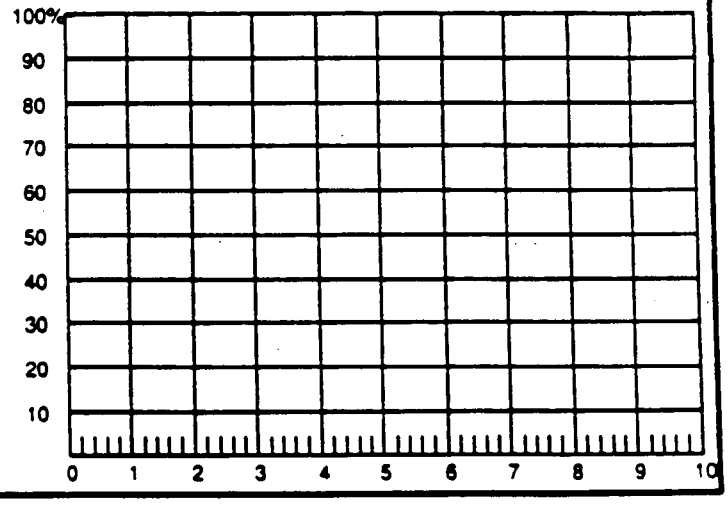
CALIBRATION

0° ☐ Axial ☐ Circ. ☐

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	–6	
80	–12	
40	+6	
20	+12	

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

RECORDING LEVEL _____

NES 9/90

NUCLEAR ENERGY SERVICES, INC.

PLANT/UNIT ____________
DATA SHEET NO ____________
PAGE ______ OF ________

EXAMINATION DATA SHEET

PROCEDURE NO ________
REVISION/CHANGE NO ________
COMPONENT/SYSTEM ________
ISO/DWG. NO ______ REV ______
THERMOMETER S/N ______
COMPONENT TEMP ____ °F

EXAMINATION WELD/AREA

SCAN USED				RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	∠	YES	NO	ACC.	REJ.

WELD CROWN LIMITATION
☐ YES ☐ NO

AREA SCANNED

SCAN USED				RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	∠	YES	NO	ACC.	REJ.

WELD CROWN LIMITATION
☐ YES ☐ NO

AREA SCANNED

SCAN USED				RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	∠	YES	NO	ACC.	REJ.

WELD CROWN LIMITATION
☐ YES ☐ NO

AREA SCANNED

SCAN USED				RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=	∠	YES	NO	ACC.	REJ.

WELD CROWN LIMITATION
☐ YES ☐ NO

AREA SCANNED

☐ SEE ATTACHED I.E.R.

1 ______________ LEVEL______ DATE________
2 ______________ LEVEL______ DATE________

REVIEWERS:
1 ______________ LEVEL______ DATE________
2 ______________ LEVEL______ DATE________
3 ______________ LEVEL______ DATE________

nes NUCLEAR ENERGY SERVICES, INC.

EXAM ITEM

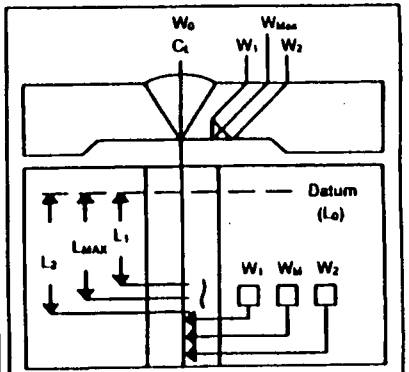
ISO/DWG. NO.

ULTRASONIC INDICATION REPORT SHEET

- ☐ PIPING WELDS
- ☐ FERRITIC VESSELS ≥ 2" T *
- ☐ OTHER _____

DATA SHEET NO. _____
PAGE _____ OF _____

SEARCH UNIT ANGLE _____° W_o LOCATION _____ L_o LOCATION _____



SAMPLE INDICATION

MP	Metal Path
RBR	Remaining Back Reflection
L	Distance from Datum
W max	Distance from W_o to S.U. at maximum response.
W_1	Distance from W_o at 50% of DAC (fwd)
W_2	Distance from W_o at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX MP	FWD 50% DAC* W_1	FWD 50% DAC* MP	BACKWARD 50% DAC* W_2	BACKWARD 50% DAC* MP	L_1 50% DAC	L max	L_2 50% DAC	RBR amp	S.U. Loc.	REMARKS

* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

NES 000

10.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SE(PLANT

SPECIAL PROCEDURE

SP-1228

ULTRASONIC EXAMINATION OF STEAM GENERATOR MAIN STEAM NOZZLE INNER RADIUS AREA

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/31/93

Expiration Date 2/28/94

RECOMMENDED BY: _____ 8/4/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 11AUG93
Manager - Technical Support — Date

CONTROLLED RECIPIENT ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 19	0

ULTRASONIC EXAMINATION

OF STEAM GENERATOR MAIN STEAM NOZZLE INNER RADIUS AREA 1

FOR

H.B. ROBINSON NUCLEAR PLANT

Project Application	Copy No.	Assigned To
2474		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	DIRECTOR ISI	
0					
1	SCOTT LARSON	Scott Larson 6-10-93	E Doolittle 6-29-93	E Doolittle 6-29-93	
2					
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REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6165

PAGE 2 OF 16

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	6/8/93	I	Revise title to . . . Steam Generator Main Steam . . .	Scott Lawson 6-10-93
		6	Change "Figure" to "Exhibit"	
		7	Add para. 8.2.5	
		8	Add Note after para. 9.3 per CRA No. 8647	

1. PURPOSE

The purpose of this procedure is to define the techniques, recording criteria and equipment for ultrasonic (UT) examination of inner radius area of steam generator main steam nozzles.

2. SCOPE

This procedure defines requirements for manual contact ultrasonic examinations of the inside radius corner of forged ferritic steam generator main steam nozzles. The corner areas are examined from the OD of the nozzle transition by use of refracted shear waves.

3. REFERENCES

3.1 ASME Boiler & Pressure Vessel Code, Section XI Appendix III 1986 Edition.

3.2 80A9068 – NES Procedure for Certifying Nondestructive Examination Personnel.

3.3 80A9053 – NES Procedure for Ultrasonic Instrument Linearity Verification.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with references 3.1 and 3.2.

4.2 It is recommended that the examination crews comprise at least two members. At least one member of each examination crew shall have a minimum certification of UT Level II. Evaluations shall be conducted by an examiner with a minimum certification of UT Level II.

4.3 A copy of each examiner's certification summary and current eye test shall be maintained on site.

4.4 A copy of each examiner's certification summary and current eye test shall be made available to the plant owner or his agent prior to performing examinations per this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT

A. A pulse echo ultrasonic flaw detection instrument with the following requirements:

1. A current acceptable linearity in accordance with Ref.3.3
2. Operates within the minimum frequency ranges of 1.0 MHz to 5.0 MHz
3. Equipped with a stepped gain control calibrated in units of 2 dB or less.

B. The following models of ultrasonic flaw detection equipment manufactured by Krautkramer Branson are acceptable for use:

USK–7
USL–40 series
USL–30 series
USK–6

5.2 SEARCH UNITS

The piezoelectric transducer shall be 2.25 MHz nominal x 0.5" maximum round or square and, when coupled to wedges similar to those illustrated in Exhibit 4, shall be capable of producing calibration as required in 7.0.

5.3 CABLE

Cables shall have appropriate connectors and may be any convenient length. Examinations shall be conducted using the same cable as that used during the calibration. The number of connectors shall be documented with the cable type on the Ultrasonic Calibration Data Sheet (Exhibit 1).

5.4 COUPLANT

Ultragel – or couplant supplied by the Plant Owner.

5.5 CALIBRATION BLOCK

Calibration block CPL–64 is to be supplied by the utility.

6. GENERAL PREREQUISITES

6.1 The components to be examined shall be identified/determined by the Plant Owner.

6.2 Calibration Blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the plant owner, e.g., the examination surface shall be free of foreign matter which may interfere with ultrasonic transmission.

NOTE: The examiner shall notify the NES "lead individual" or other designated contact individual when surface preparation of scanning surfaces and identification of reference points are not suitable for ultrasonic examination.

6.4 Previous examination data provided by the Plant Owner shall be reviewed by the examiner and the following items should be identified:

A. 0° information for interfering conditions

B. Weld configuration

C. Obstructions

D. Recordable indications

E. Previous examination technique

F. Use the preceding information/data to make a determination (prior to starting examination) of the extent of coverage of the examination volume and limitations (if any), and the best examination technique(s) to apply.

6.5 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows:

A. Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

B. Screen height and amplitude control linearities should be performed daily (when in use).

6.6 The calibration block surface temperature shall be within 25°F of the component to be examined.

7. SYSTEM CALIBRATION

7.1 Prior to conducting examinations, the complete system to be utilized shall be calibrated on the applicable calibration block for the examinations to be conducted. The system is defined as: the ultrasonic instrument (and battery pack if applicable), cable(s), transducer, wedges, couplant, and any other apparatus, instrument or circuit employed between the instrument and the calibration block surface. Once calibration has been established, any change to any part of the system will require at least a verification of the calibration.

7.1.1 Scan directions CW and CCW require different wedges; therefore, calibration as follows shall be accomplished for each scan direction, using the notches in surface B for direction CW and those in surface C for direction CCW. Reference Exhibit 6 for surfaces B/C.

7.2 Sweep range shall be sufficiently long so as to allow display of the volume to be examined, within 100% of sweep. Sweep shall be calibrated to provide essentially equal spacing of the three appropriate reflectors.

7.2.1 Position the search unit for the maximum response from the appropriate notch C (Reference Exhibit 6). Adjust the left edge of this reflector to 70% sweep.

7.2.2 Position the search unit for the maximum response from the appropriate notch A. Adjust the left edge of this reflector to 30% sweep.

7.2.3 Repeat delay and range control adjustments until notches A and C reflectors start at 30% and 70% sweep, respectively.

7.3 Reference sensitivity shall be established by obtaining a peaked response from the appropriate B or C notch that provides the strongest signal and adjusting the sensitivity to 80% of FSH (Full Screen Height).

7.3.1 Without changing the gain control, determine peak reflector amplitude from the remaining applicable reflector positions. Construct a distance amplitude curve (DAC) on the screen by a line connecting each of the peaked points and extend this line through the 100% sweep line.

7.4 A reference line at 20% of DAC shall also be established on the screen by decreasing DAC reference point by 12dB. The resulting 20% DAC reference line shall be marked on the screen.

8. SYSTEM CALIBRATION VERIFICATION

8.1 Calibration shall be verified at the beginning of each day of examination, and at the end of examinations for which calibration is applicable or every 12 hours, whichever is less, and with any change in examination personnel.

8.1.1 A DECREASE in sensitivity of 2dB or 20% shall require recalibration and re–examination of all items examined since the previous acceptable calibration or calibration check. An INCREASE in sensitivity of more than 2 dB or 20% shall require recalibration and re–examination and data correction of all indications recorded since the previous acceptable calibration or calibration check.

8.1.2 If any point on the DAC has moved on the sweep line more than 10% of the sweep division reading, correct the sweep range calibration and note the correction in the examination record. If recordable reflectors are on the data sheets, these data shall be voided, a new calibration established, and areas relative to the voided data shall be re–examined.

8.2 SCANNING

8.2.1 Examinations shall be performed clockwise and counterclockwise from the OD transition of the nozzle.

8.2.2 The examinations shall be conducted at 2X (+ 6dB) greater than the calibration sensitivity. If this causes noise to exceed the 50% DAC line, 2X may be reduced, but in no case shall it be less than 1X.

8.2.3 Rate of scanning shall not exceed 4 inches per second.

8.2.4 Scanning shall be accomplished on the OD transition and the search unit shall be indexed (not more than 50% of the transducer size) vertically on the scan area of the OD transition while progressing CW and CCW for 360° around the nozzle. Reference Exhibits 5 and 7 for minimum scan locations, and for illustrative sound beam paths and coverage.

8.2.5 If necessary, layout lines may be used to aid in scanning. Only plant approved markers may be used.

9. RECORDING

9.1 The examiner shall interpret all indications greater than 20% DAC so that he can assess their source and cause in terms of their being either valid or non–valid.

9.1.1 Valid indications are reflectors caused by flaws, such as cracks. All other indications are considered non–valid, including those due to: scanning noise, grain structure or beam redirection.

9.1.2 All reflectors shall be investigated by the examiner in terms of the recording requirements of 9.3.

9.2 Other transducers, search units, frequencies, techniques, etc., may be used to aid interpretation and investigation.

9.2.1 If such aids necessitate use of any control that cannot be positively returned to its calibrated position, (such as a potentiometer control on sweep, damping, uncalibrated gain, etc.) primary reference calibration shall be verified before use and re–established prior to continuing examinations.

9.3 INDICATIONS TO BE RECORDED

NOTE: **Any indication suspected to result from cracking, shall be recorded regardless of amplitude.**

9.3.1 Valid flaw indications which provide a response equal to or greater than 50% of primary reference DAC shall be considered as recordable indication.

9.3.1.1 Each such indication shall be noted on the Indication Report Sheet, and as a minimum, peak amplitude, sweep position, search unit location and direction shall be noted.

9.3.2 Valid flaw indications which provide a response less than 50% of primary reference DAC shall be considered as non–recordable indication.

9.3.3 Each such indication shall be noted on the Indication Report Sheet, and as a minimum, peak amplitude, sweep position, search unit location and direction shall be noted.

10. EXAMINATION RECORDS

A. NES shall be responsible for submitting to the Plant Owner or his Agent, a complete set of examination records.

B. Exhibit 1 shall be completed by examiners to the extent possible, at the time of the calibration. Where the sheet cannot be corr pleted at the time of the calibration, the sheet shall be completed promptly after the last examination that uses that calibration.

C. Exhibits 2 and 3 shall be completed by the examiners as required.

D. The examiner(s) shall sign the completed data sheet, noting applicable NDE Certification level(s).

E. NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

11. ATTACHMENTS

11.1 Exhibit 1 – Ultrasonic Calibration Data Sheet

11.2 Exhibit 2 – Ultrasonic Examination Data Sheet

11.3 Exhibit 3 – Ultrasonic Indication Report Sheet

11.4 Exhibit 4 – Transducer Wedge Illustrations

11.5 Exhibit 5 – Required Examination Volume

11.6 Exhibit 6 – Calibration Block – CPL–64

11.7 Exhibit 7 – Main Steam Nozzle Layout

11.8 Exhibit 8 – Angle Beam Verification Block 5.0" presentation

11.9 Exhibit 9 – Angle Beam Verification Block 10.0" presentation

11.10 Exhibit 10 Angle Beam Verification Block 20.0" presentation

DATA SHEET NO. _____

PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____

REV. _____

CHANGE NO. _____

INSTRUMENT

Model _____

Serial No. _____

Sweep Length _____ Delay _____

Range _____

Gain (coarse) _____ dB

Gain (fine) _____ dB

Reference Sensitivity _____ dB

Remarks: _____

SEARCH UNIT

Serial No. _____

Size _____

Frequency _____ MHz

Mode _____

Nom. Angle _____ — — °

Measured Angle _____

Cable Type _____

Cable Length _____

Remarks: _____

CALIBRATION BLOCK

No. _____

"T" _____ Dia. _____

Temperature _____ °F

Thermometer S/N _____

CALIBRATION

0° ☐ Axial ☐ Circ. ☐

Metal Path ☐ Depth ☐

Each Major Screen Div. = _____

Remarks _____

COUPLANT

Brand _____

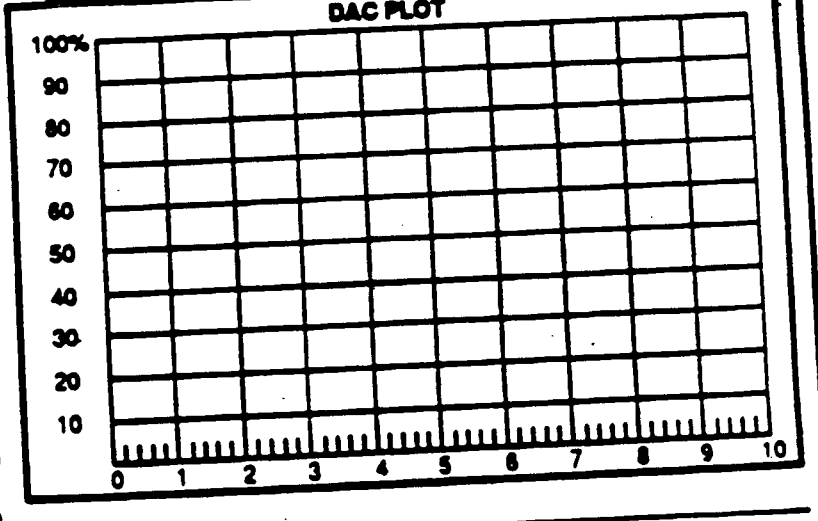
Batch No. _____

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

DAC PLOT



AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	
80	-12	
40	+6	
20	+12	

CAL. CHECKS	TIME
INITIAL CAL.	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	

REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____

2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____

2 _____ LEVEL _____ DATE _____

3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC CALIBRATION DATA SHEET
EXHIBIT 1

DATA SHEET NO. ______
PAGE ______ OF ______
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM ______
ISO/DWG. NO. ______ REV. ______
THERMOMETER S/N ______
COMPONENT TEMP. ______ °F

SCAN ______° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ______° SCAN dB ______				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:
1 ______ LEVEL ______ DATE ______
2 ______ LEVEL ______ DATE ______

REVIEWERS:
1 ______ LEVEL ______ DATE ______
2 ______ LEVEL ______ DATE ______
3 ______ LEVEL ______ DATE ______

nes NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC EXAMINATION SHEET
EXHIBIT 2

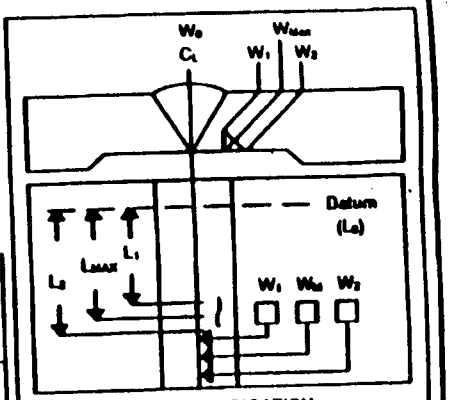
EXAM ITEM

ISO/DWG. NO.

ULTRASONIC INDICATION REPORT SHEET

- ☐ PIPING WELDS
- ☐ FERRITIC VESSELS ≥ 2" T *
- ☐ OTHER _____

DATA SHEET NO. _____
PAGE _____ OF _____



SAMPLE INDICATION

SEARCH UNIT ANGLE _____° Wo LOCATION _____ Ls LOCATION _____

MP Metal Path
RBR Remaining Back Reflection
L Distance from Datum

W max Distance from Wo to S.U. at maximum response.
W1 Distance from Wo at 50% of DAC (fwd)
W2 Distance from Wo at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX MP	FWD 50% DAC* W1	FWD 50% DAC* MP	BACKWARD 50% DAC* Wo	BACKWARD 50% DAC* MP	L1 50% DAC	L max	Ls 50% DAC	RBR amp	S.U. Loc.	REMARKS

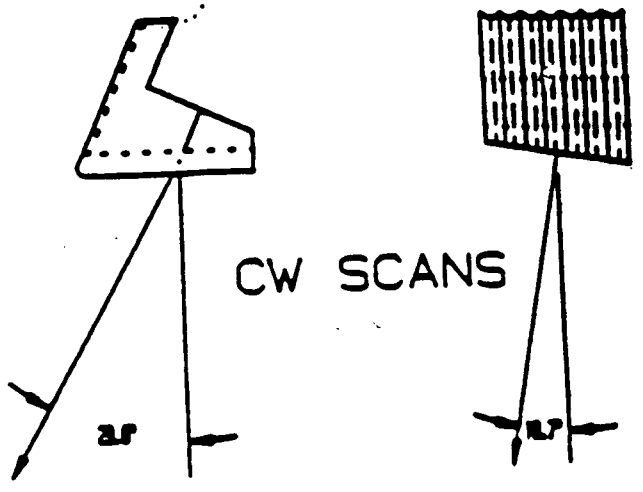
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC INDICATION REPORT SHEET
EXHIBIT 3



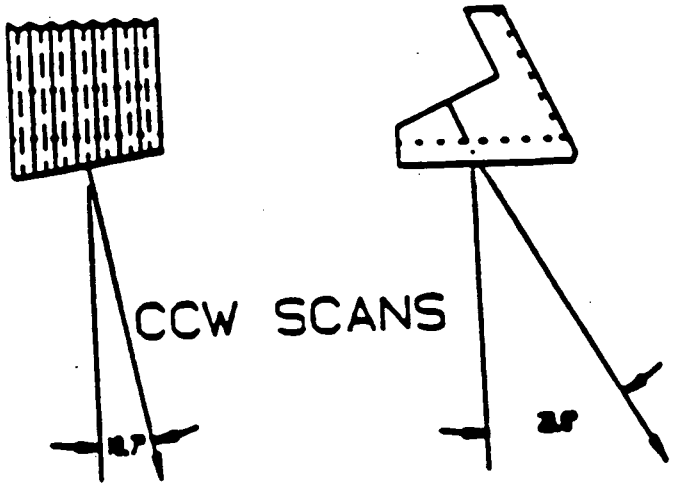


EXHIBIT 4
TRANSDUCER WEDGE ILLUSTRATIONS

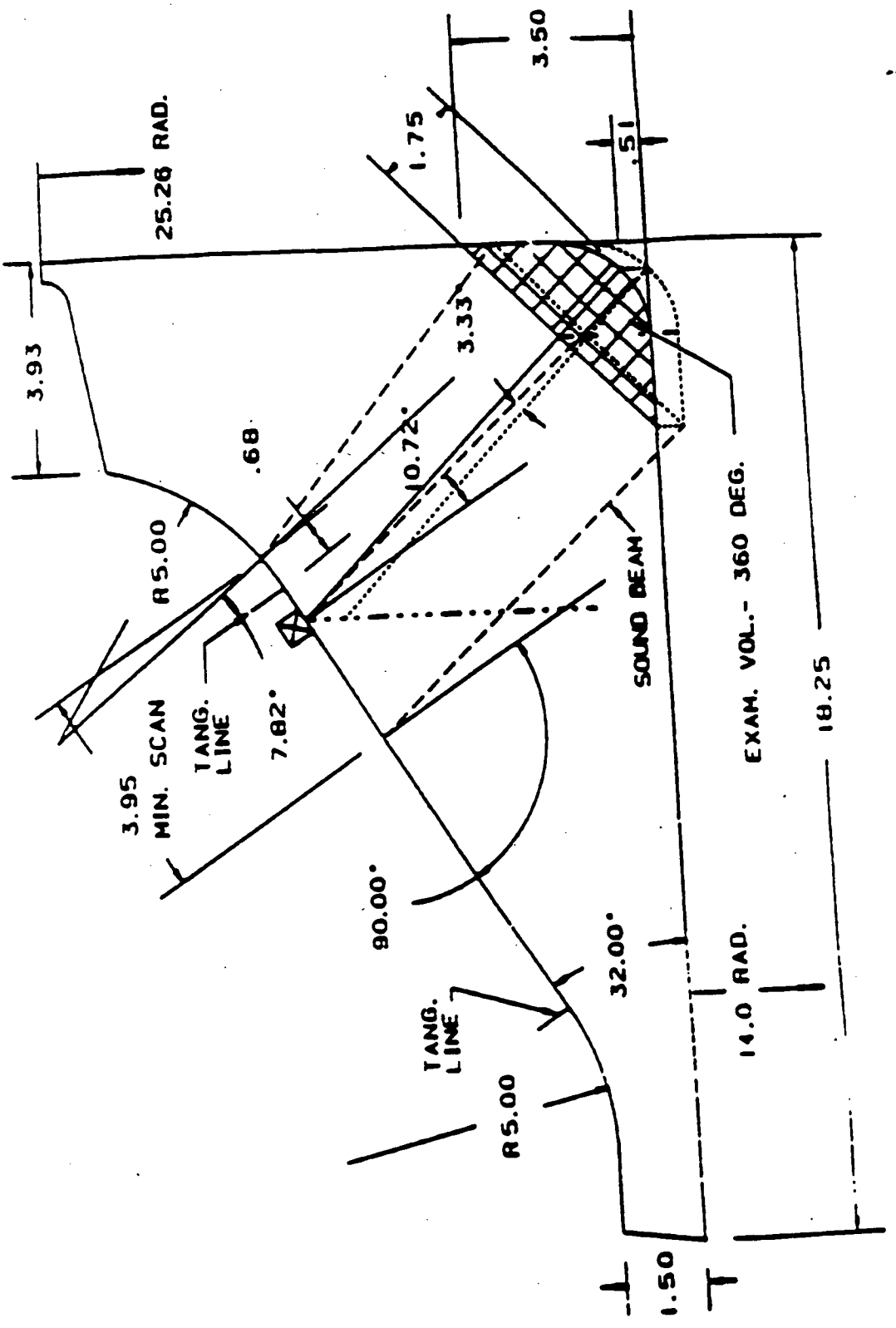


EXHIBIT 5
REQUIRED EXAMINATION VOLUME

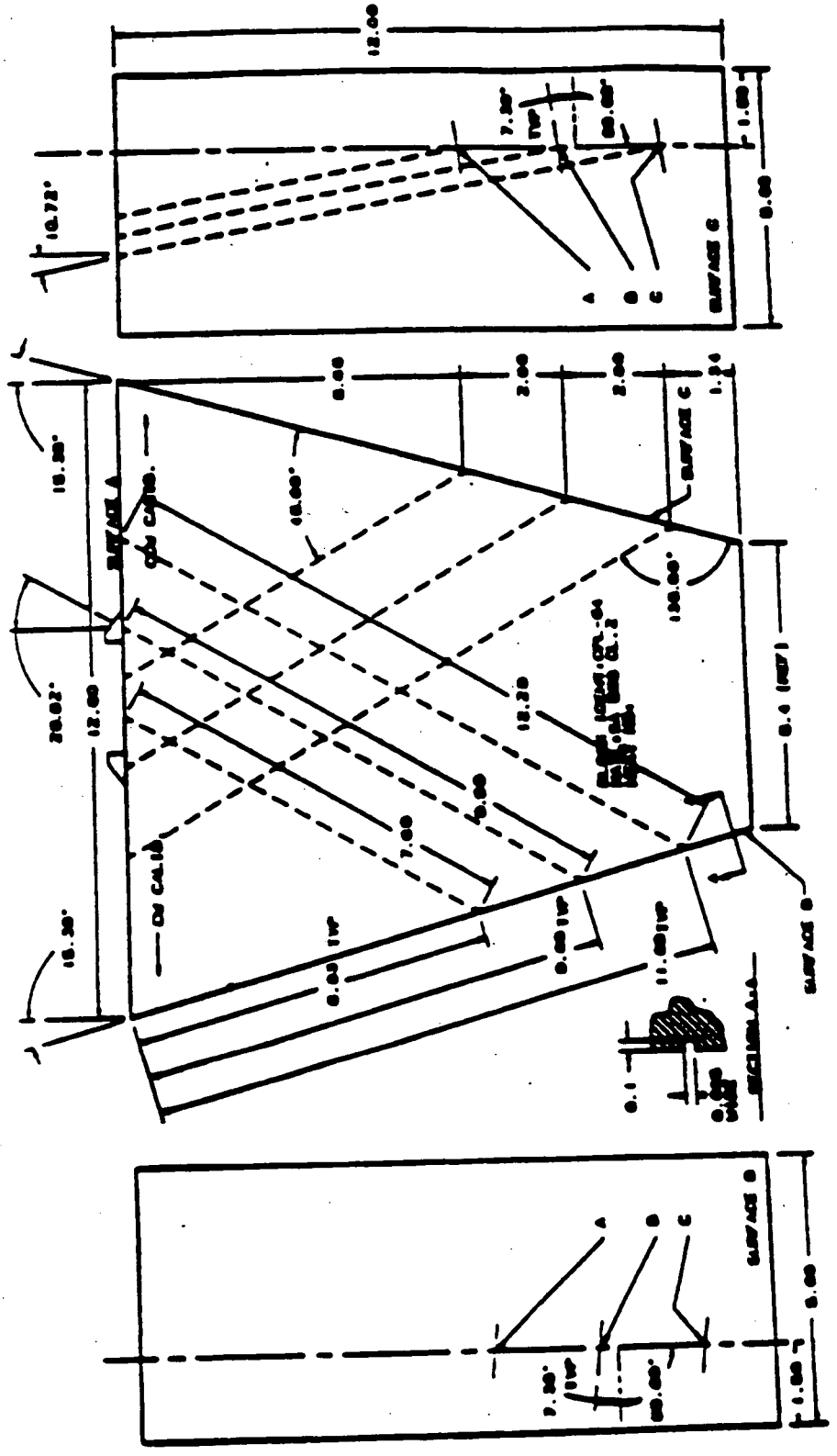


EXHIBIT 6
CALIBRATION BLOCK CPL-64

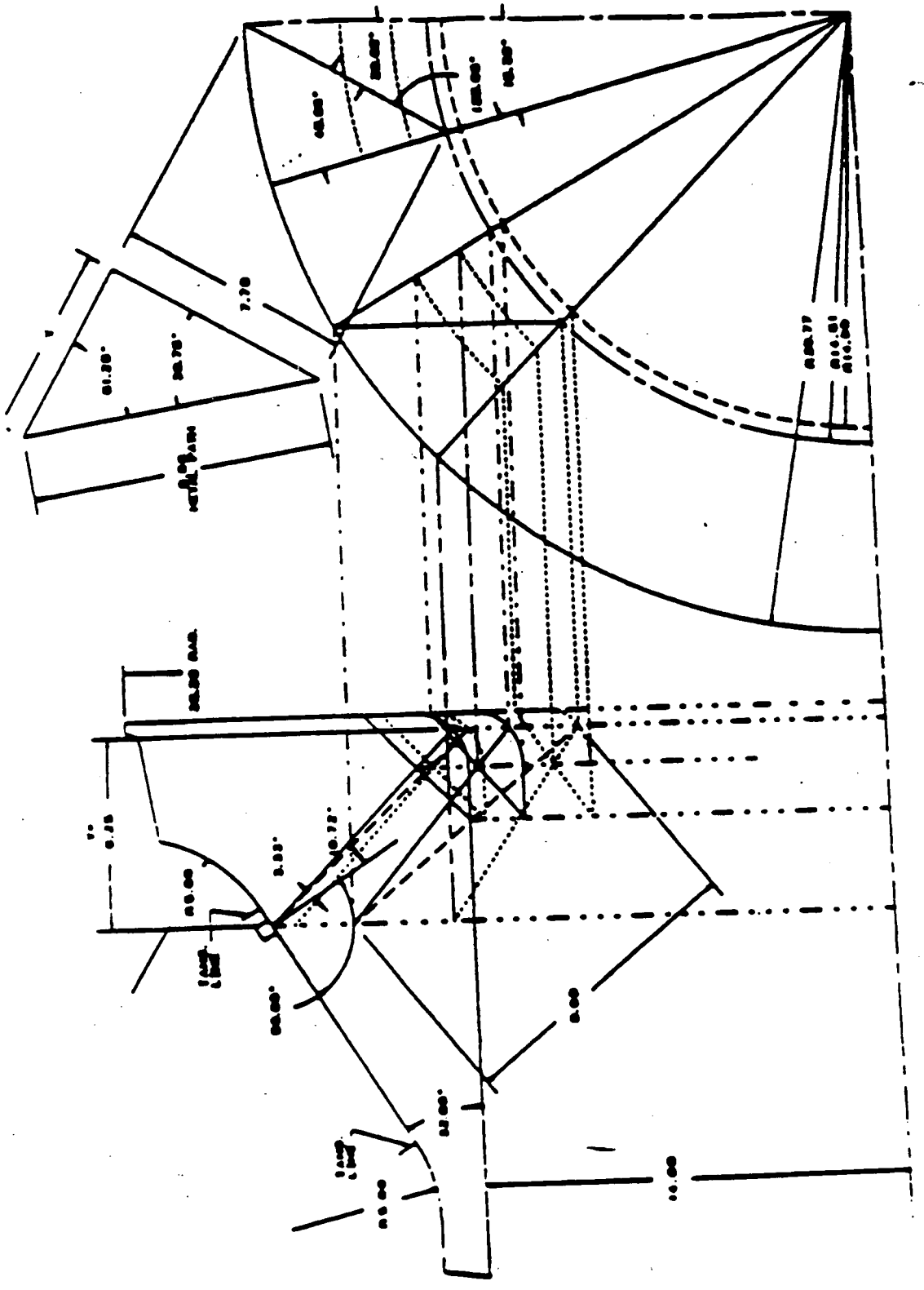


EXHIBIT 7
MAIN STEAM NOZZLE LAYOUT

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEC PLANT

SPECIAL PROCEDURE

SP-1229

ULTRASONIC EXAMINATION OF STEAM GENERATOR FEEDWATER NOZZLE INNER RADIUS AREA

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/31/93

Expiration Date 2/28/94

RECOMMENDED BY: _____ 8/4/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 11AUG93
Manager - Technical Support — Date

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 19	0

ULTRASONIC EXAMINATION

OF STEAM GENERATOR FEEDWATER NOZZLE INNER RADIUS AREA

FOR

H.B. ROBINSON NUCLEAR PLANT

Project Application	Copy No.	Assigned To
2474		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III UT	DIRECTOR, ISI		
0	Scott Larson				
1	Scott Larson	Scott Larson 6-30-93	E.G. Doubleday 7-2-93		
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

nes NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6164

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	6/14/93	7,8	Add para. 8.2.5, 8.2.6 and "NOTE" after 9.3 per	Scott [illegible]
			CRA 8651	
		14	Add dimensions to Exhibit 5	

1. PURPOSE

The purpose of this procedure is to define the techniques, recording criteria and equipment for ultrasonic (UT) examination of inner radius area of steam generator feedwater nozzles.

2. SCOPE

This procedure defines requirements for manual contact ultrasonic examinations of the inside radius corner of forged ferritic (A508–CL2) steam generator feedwater nozzles. The corner areas are examined from the OD of the nozzle radius by use of refracted shear waves.

3. REFERENCES

3.1 ASME Boiler & Pressure Vessel Code, Section XI Appendix III 1986 Edition.

3.2 80A9068 – NES Procedure for Certifying Nondestructive Examination Personnel.

3.3 80A9053 – NES Procedure for Ultrasonic Instrument Linearity Verification.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing examinations to this procedure shall be certified in accordance with references 3.1 and 3.2.

4.2 It is recommended that the examination crews comprise at least two members. At least one member of each examination crew shall have a minimum certification of UT Level II. Evaluations shall be conducted by an examiner with a minimum certification of UT Level II.

4.3 A copy of each examiner's certification summary and current eye test shall be maintained on site.

4.4 A copy of each examiner's certification summary and current eye test shall be made available to the plant owner or his agent prior to performing examinations per this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT

A. A pulse echo ultrasonic flaw detection instrument with the following requirements:

1. A current acceptable linearity in accordance with Ref.3.3
2. Operates within the minimum frequency ranges of 1.0 MHz to 5.0 MHz
3. Equipped with a stepped gain control calibrated in units of 2 dB or less.

B. The following models of ultrasonic flaw detection equipment manufactured by Krautkramer Branson are acceptable for use:

USK–7
USL–40 series
USL–30 series
USK–6

5.2 SEARCH UNITS

The piezoelectric transducer shall be 2.25 MHz nominal x 0.5" wide x 1.0" long maximum and, when coupled to wedges similar to those illustrated in Exhibit 4, shall be capable of producing calibration as required in 7.0.

5.3 CABLE

Cables shall have appropriate connectors and may be any convenient length. Examinations shall be conducted using the same cable as that used during the calibration. The number of connectors shall be documented with the cable type on the Ultrasonic Calibration Data Sheet (Exhibit 1).

5.4 COUPLANT

Ultragel – or couplant supplied by the Plant Owner.

5.5 CALIBRATION BLOCK

Calibration block CPL–63 is to be supplied by the utility.

6. GENERAL PREREQUISITES

6.1 The components to be examined shall be identified/determined by the Plant Owner.

6.2 Calibration Blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the plant owner, e.g., the examination surface shall be free of foreign matter which may interfere with ultrasonic transmission.

NOTE: The examiner shall notify the NES "lead individual" or other designated contact individual when surface preparation of scanning surfaces and identification of reference points are not suitable for ultrasonic examination.

6.4 Previous examination data provided by the Plant Owner shall be reviewed by the examiner and the following items should be identified:

A. 0° information for interfering conditions

B. Weld configuration

C. Obstructions

D. Recordable indications

E. Previous examination technique

F. Use the preceding information/data to make a determination (prior to starting examination) of the extent of coverage of the examination volume and limitations (if any), and the best examination technique(s) to apply.

6.5 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows:

A. Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

B. Screen height and amplitude control linearities should be performed daily (when in use).

6.6 The calibration block surface temperature shall be within 25°F of the component to be examined.

7. SYSTEM CALIBRATION

7.1 Prior to conducting examinations, the complete system to be utilized shall be calibrated on the applicable calibration block for the examinations to be conducted. The system is defined as: the ultrasonic instrument (and battery pack if applicable), cable(s), transducer, wedges, couplant, and any other apparatus, instrument or circuit employed between the instrument and the calibration block surface. Once calibration has been established, any change to any part of the system will require at least a verification of the calibration.

7.1.1 Scan directions CW and CCW require different wedges; therefore, calibration as follows shall be accomplished for each scan direction, using the notches on the appropriate side indicated for direction CW and for direction CCW. Direction CW is as viewed from the OD, facing the vessel. Reference Exhibit 6 for appropriate CW and CCW calibration notches.

7.2 Sweep range shall be sufficiently long so as to allow display of the volume to be examined, within 100% of sweep. Sweep shall be calibrated to provide essentially equal spacing of the three appropriate reflectors.

7.2.1 Position the search unit for the maximum response from the appropriate notch C (Reference Exhibit 6). Adjust the left edge of this reflector to 70% sweep.

7.2.2 Position the search unit for the maximum response from the appropriate notch A. Adjust the left edge of this reflector to 30% sweep.

7.2.3 Repeat delay and range control adjustments until notches A and C reflectors start at 30% and 70% sweep, respectively.

7.3 Reference sensitivity shall be established by obtaining a peaked response from the appropriate B or C notch that provides the strongest signal and adjusting the sensitivity to 80% of FSH (Full Screen Height).

7.3.1 Without changing the gain control, determine peak reflector amplitude from the remaining applicable reflector positions. Construct a distance amplitude curve (DAC) on the screen by a line connecting each of the peaked points and extend this line through the 100% sweep line.

7.4 A reference line at 20% of DAC shall also be established on the screen by decreasing DAC reference point by 12dB. The resulting 20% DAC reference line shall be marked on the screen.

8. SYSTEM CALIBRATION VERIFICATION

8.1 Calibration shall be verified at the beginning of each day of examination, and at the end of examinations for which calibration is applicable or every 12 hours, whichever is less, and with any change in examination personnel.

8.1.1 A DECREASE in sensitivity of 2dB or 20% shall require recalibration and re–examination of all items examined since the previous acceptable calibration or calibration check. An INCREASE in sensitivity of more than 2 dB or 20% shall require recalibration and re–examination and data correction of all indications recorded since the previous acceptable calibration or calibration check.

8.1.2 If any point on the DAC has moved on the sweep line more than 10% of the sweep division reading, correct the sweep range calibration and note the correction in the examination record. If recordable reflectors are on the data sheets, these data shall be voided, a new calibration established, and areas relative to the voided data shall be re–examined.

8.2 SCANNING

8.2.1 Examinations shall be performed clockwise and counterclockwise from the OD radius of the nozzle.

8.2.2 The examinations shall be conducted at 2X (+ 6dB) greater than the calibration sensitivity. If this causes noise to exceed the 50% DAC line, 2X may be reduced, but in no case shall it be less than 1X.

8.2.3 Rate of scanning shall not exceed 4 inches per second.

8.2.4 Scanning shall be accomplished on the OD radius and the search unit shall be indexed (not more than 50% of the transducer size) radially on the scan surface while progressing CW and CCW for 360° around the nozzle. Reference Exhibit 5 and 7 for minimum scan locations, and for illustrative sound beam paths and coverage. Scans/indexing may be divided into segments for ease of examination.

8.2.5 In order to establish the correct scan area it is necessary to locate the center of the 5" radius on the OD of the nozzle. For CW and CCW scanning directions the minimum scan area is from the 5" radius centerline to a point 2.14" on the generator shell side of the 5" radius. Where possible an additional 1" on either side of this area should be scanned to ensure coverage. (See Exhibit 5.)

8.2.6 If necessary, layout lines may be used to aid in scanning. Only plant approved markers may be used.

9. RECORDING

9.1 The examiner shall interpret all indications greater than 20% DAC so that he can assess their source and cause in terms of their being either valid or non–valid.

9.1.1 Valid indications are reflectors caused by flaws, such as cracks. All other indications are considered non–valid, including those due to: scanning noise, grain structure or beam redirection.

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9.3.2 Valid flaw indications which provide a response less than 50% of primary reference DAC shall be considered as non–recordable indication.

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A. NES shall be responsible for submitting to the Plant Owner or his Agent, a complete set of examination records.

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C. Exhibits 2 and 3 shall be completed by the examiners as required.

D. The examiner(s) shall sign the completed data sheet, noting applicable NDE Certification level(s).

E. NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

11. ATTACHMENTS

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11.2 Exhibit 2 – Ultrasonic Examination Data Sheet

11.3 Exhibit 3 – Ultrasonic Indication Report Sheet

11.4 Exhibit 4 – Transducer Wedge Illustrations

11.5 Exhibit 5 – Required Examination Volume

11.6 Exhibit 6 – Calibration Block – CPL–63

11.7 Exhibit 7 – Feedwater Nozzle Layout

11.8 Exhibit 8 – Angle Beam Verification Block 5.0" presentation

11.9 Exhibit 9 – Angle-Beam Verification Block 10.0" presentation

11.10 Exhibit 10 Angle Beam Verification Block 20.0" presentation

DATA SHEET NO. _____
PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____
REV. _____
CHANGE NO. _____

INSTRUMENT

Model _____
Serial No. _____
Sweep Length _____ Delay _____
Range _____
Gain (coarse) _____ dB
Gain (fine) _____ dB
Reference Sensitivity _____ dB
Remarks: _____

SEARCH UNIT

Serial No. _____
Size _____
Frequency _____ MHz
Mode _____
Nom. Angle _____ °
Measured Angle _____ °
Cable Type _____
Cable Length _____
Remarks: _____

CALIBRATION BLOCK

No. _____
"T" _____ Dia. _____
Temperature _____ ° F
Thermometer S/N _____

CALIBRATION

0° ☐ Axial ☐ Circ. ☐
Metal Path ☐ Depth ☐
Each Major Screen Div. = _____
Remarks _____

COUPLANT

Brand _____
Batch No. _____

VERTICAL LINEARITY

AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

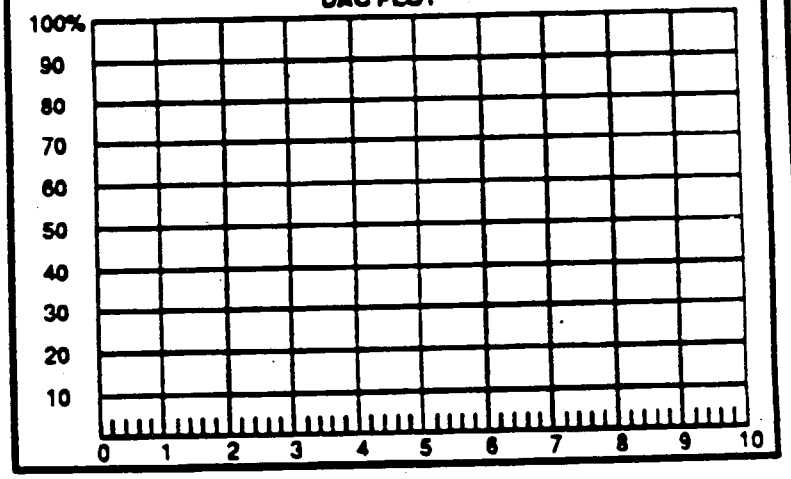
AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	
80	-12	
40	+6	
20	+12	

CAL CHECKS

CAL CHECKS	TIME
INITIAL CAL	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL	

DAC PLOT



REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC CALIBRATION DATA SHEET
EXHIBIT 1

DATA SHEET NO.________________

PAGE ______ OF _______

EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM____________

ISO/DWG. NO._______ REV._____

THERMOMETER S/N____________

COMPONENT TEMP._________ °F

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

EXAMINERS:

1 ________________ LEVEL______ DATE ______

2 ________________ LEVEL______ DATE ______

REVIEWERS:

1 ________________ LEVEL______ DATE ______

2 ________________ LEVEL______ DATE ______

3 ________________ LEVEL______ DATE ______

nes NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC EXAMINATION SHEET
EXHIBIT 2

ULTRASONIC INDICATION REPORT SHEET
EXHIBIT 3

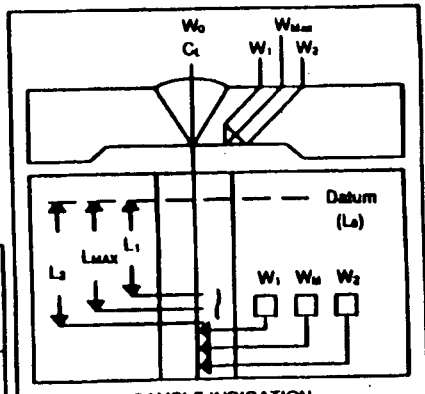
EXAM ITEM

ISO/DWG. NO.

ULTRASONIC INDICATION REPORT SHEET

- ☐ PIPING WELDS
- ☐ FERRITIC VESSELS ≥ 2" T *
- ☐ OTHER _____

DATA SHEET NO. _____
PAGE _____ OF _____



SAMPLE INDICATION

SEARCH UNIT ANGLE _____° Wo LOCATION _____ Lo LOCATION _____

MP Metal Path
RBR Remaining Back Reflection
L Distance from Datum
W max Distance from Wo to S.U. at maximum response.
W1 Distance from Wo at 50% of DAC (fwd)
W2 Distance from Wo at 50% of DAC (backward)

Ind. No.	% of DAC*	W	MAX	FWD 50% DAC*		BACKWARD 50% DAC*		L1	L	L2	RBR	S.U.	REMARKS
		W	MP	W1	MP	W2	MP	50% DAC	max	50% DAC	amp	Loc.	

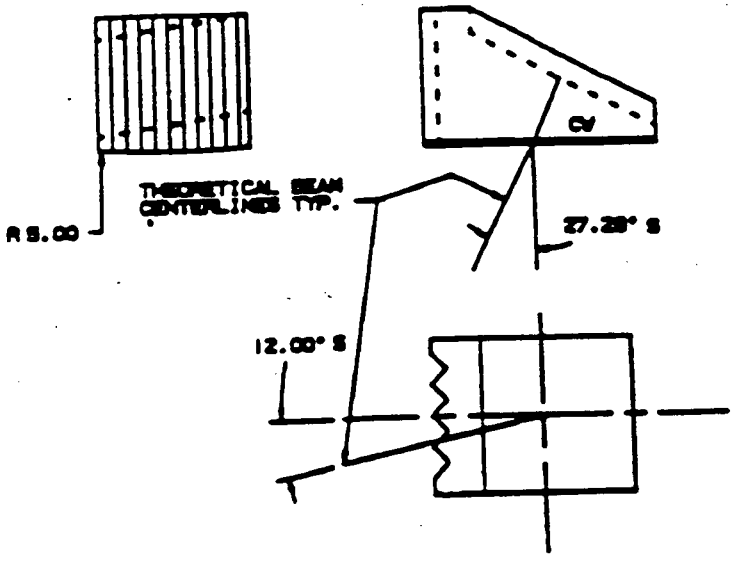
* Ferritic vessels ≥ 2" T: record 50% of maximum response for indications over 100% DAC.

EXAMINERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
REVIEWERS 1 _____ LEVEL _____ DATE _____
2 _____ LEVEL _____ DATE _____
3 _____ LEVEL _____ DATE _____

nes NUCLEAR ENERGY SERVICES, INC.

ILLUSTRATIVE COMPOUND REFRACTED ANGLE FOR FEED WATER INNER RADIUS

CW SCANS



CCW SCANS

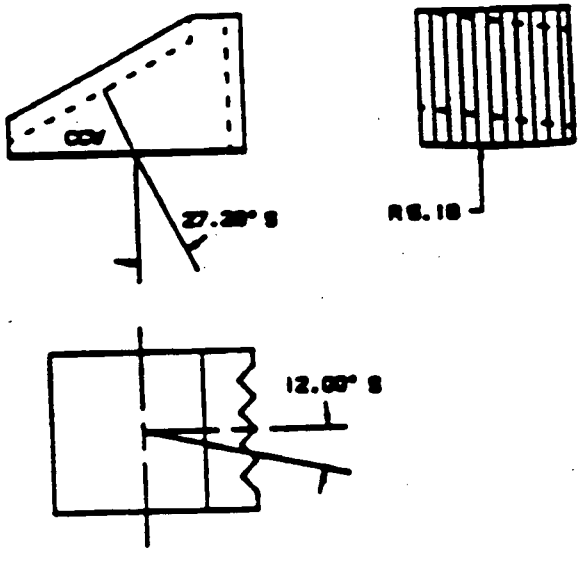
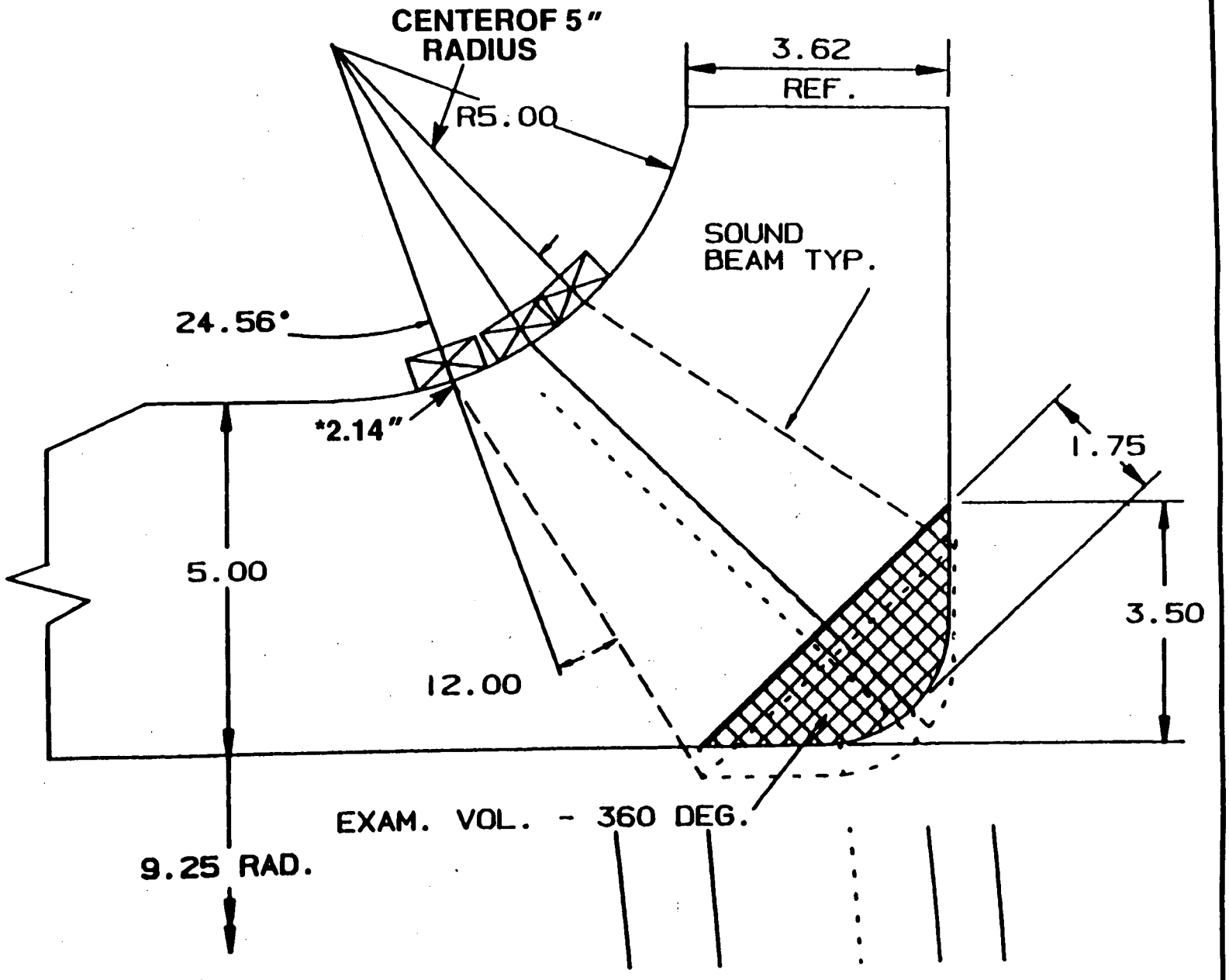
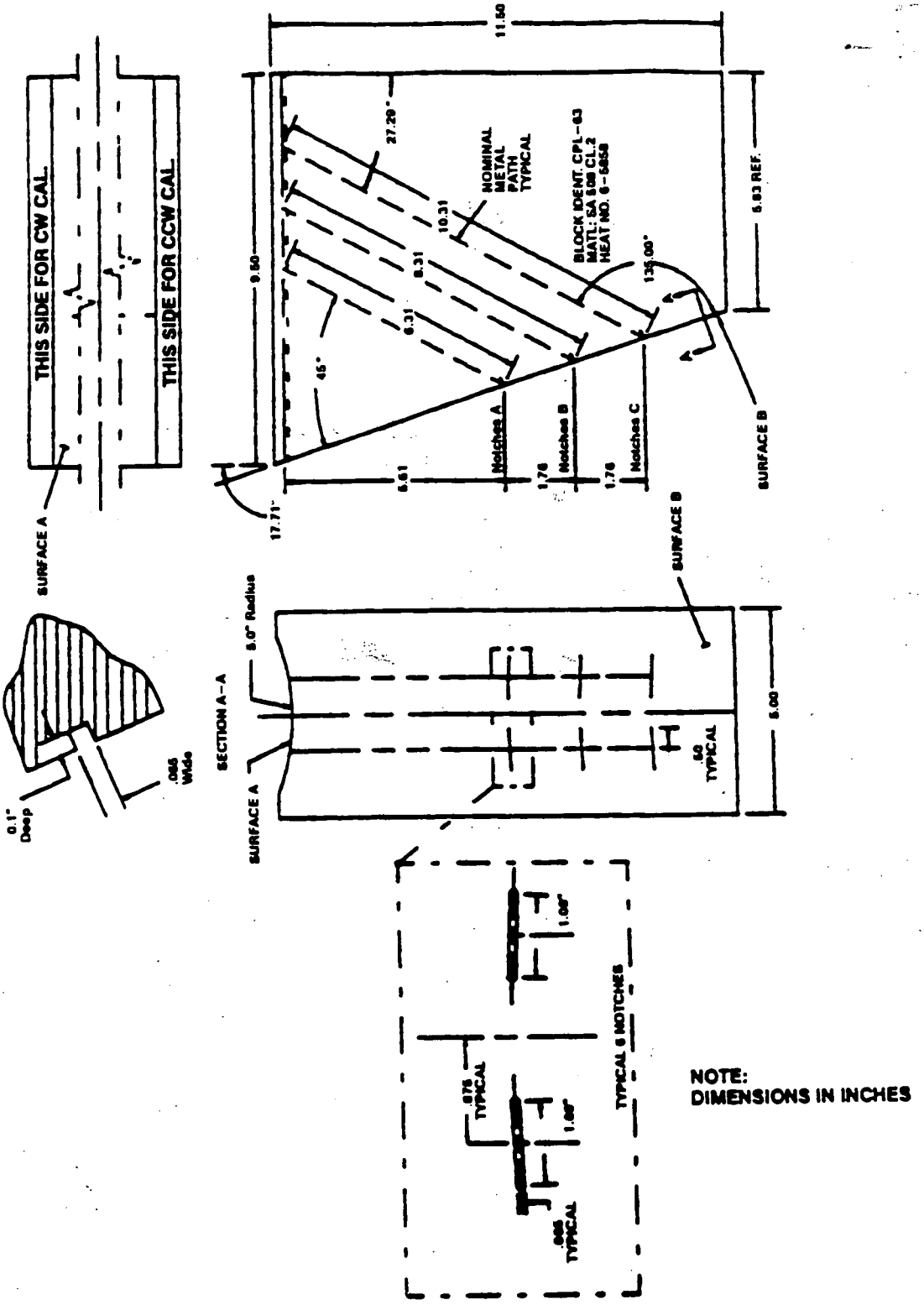


EXHIBIT 4
TRANSDUCER WEDGE ILLUSTRATIONS

EXHIBIT 5
REQUIRED EXAMINATION VOLUME



*2.14" = Minimum Scan Area
Add 1" to either side where possible
to ensure complete coverage.



NOTE:
DIMENSIONS IN INCHES

EXHIBIT 6
CALIBRATION BLOCK CPL-63

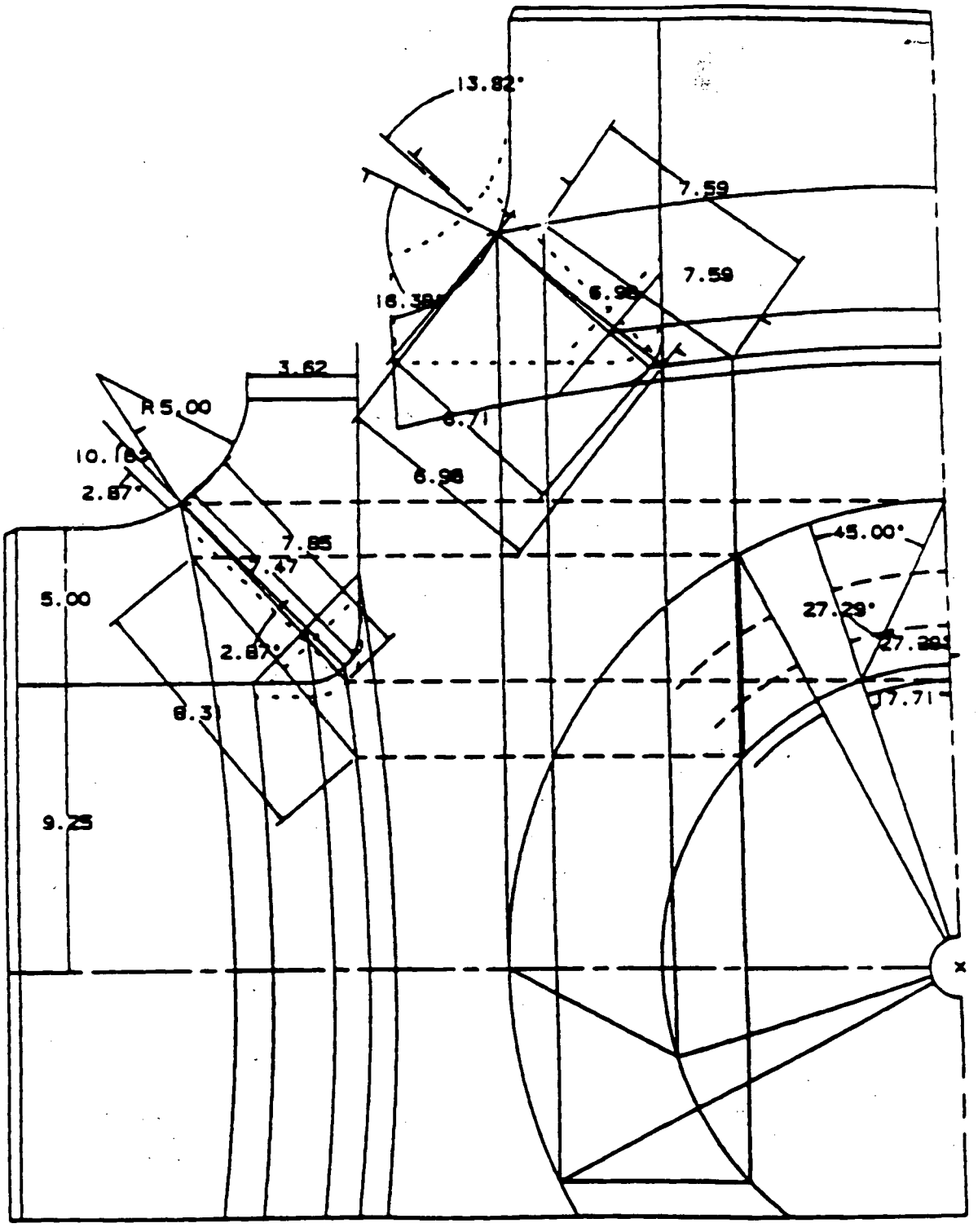


EXHIBIT 7
FEED WATER NOZZLE LAYOUT

12.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

FOR INFORMATION ONLY

SPECIAL PROCEDURE

SP-1230

VT-3 VISUAL EXAMINATION OF NUCLEAR POWER PLANT COMPONENTS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/31/93

Expiration Date 2/28/94

RECOMMENDED BY: _____ 8/4/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 11AUG93
Manager - Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

FOR INFORMATION ONLY

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 22	0

VT-3 VISUAL EXAMINATION

OF

NUCLEAR POWER PLANT COMPONENTS

Project Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	VT Level III	Project Mgr.	Dept. Mgr.	
0	Scott Larson				
1	Scott Larson				
2	Scott Larson				
3	Scott Larson		07-7-93	07-7-93	
4					
5					
6					
7					
8					
9					
10					
11					

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6163

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	03-04-92	3, 6	Revised to delete references to CP&L Procedures.	
		8, 15	Refer to CRA 8292.	
2	04-03-92	4, 5 11,12	Add Sketches and References	
3	07-01-93	3,4 6-9	Extensive revision per CRA #8659	07-06-93
		15		

1. PURPOSE

The purpose of this procedure is to delineate the VT-3 visual examination criteria specified by ASME Section XI, 1986 Edition, no addenda, for preservice and inservice visual examination of nuclear power plant components at the Robinson Nuclear Project.

2. SCOPE

2.1 This procedure defines the methods and requirements for a VT-3 visual examination as specified in Section XI of the ASME Code. The examination shall be performed to determine the general mechanical and structural conditions of components and their supports for conditions such as the verification of clearances, settings, physical displacements, loose or missing parts, debris, corrosion, wear, erosion or the loss of integrity at bolted or welded connections.

The VT-3 examination shall include examinations for conditions that could affect operability or functional adequacy of snubbers, and constant load and spring type supports.

For component supports and component interiors, the visual examination may be performed remotely with or without optical aids to verify the structural integrity of the component.

2.2 When specific methods and details of examinations are defined in specific plant special procedures and/or periodic test procedures, those procedures shall have been reviewed and approved by appropriate plant and/or CP&L Level III personnel. When such procedures are used, they shall be used in conjunction with this procedure in the performance of the examination. Documentation shall be as specified in the special or periodic test procedure.

2.3 When plant specifications or procedures require examinations to be performed in accordance with an approved VT-3 procedure (with no specific details of the examination provided in the specification or procedure), this procedure and associated documentation shall be used.

3. GENERAL

3.1 This procedure is applicable to the VT-3 visual examinations of components, their supports, and reactor pressure vessel interior surfaces for integrity and operability.

3.2 The examination area for component supports extends from the component attachment to and including the attachment connection to the supporting, structure as defined below:

3.2.1 Component Attachment to the Support

3.2.1.1 Integral attachment boundaries on pressure retaining components are depicted on Figures 1, 2 and 3, as appropriate.

3.2.1.2 Non integral attachment boundaries begin at the contact surface between the support and the component. See Figures 2 and 3, as appropriate.

3.2.1.3 When non–integral connections between the support/snubber and the component are covered by insulation, the examination boundary for the support/snubber shall be determined by ISI. When examining non–integral attachments to the pressure boundary, visual examination personnel should expect to encounter one of the following conditions, which has been predetermined and specified by ISI.

A. Insulation covering the pipe clamp and bolting of the support/snubber to the pressure boundary.

B. Insulation covering the pipe clamp but removed from the bolting.

C. Insulation removed completely from the bolting, pipe clamp and pressure retaining material. This latter condition will not be frequently encountered as it will be used only in the special cases.

When existing non–integral connections to pressure retaining materials are covered by insulation, the insulation shall be examined for damage one pipe diameter on either side of the connection. Damage could result from concealed broken or loose parts.

The visual examiner shall ensure that the extent of the insulation coverage or removal conforms to the conditions specified by ISI.

3.2.2 The examination boundary for both integral and non integral attachment ends at the building structure surface or at the surface of intervening elements to which the support is connected.

NOTE: Generally the examination area for supports is defined as beginning; 1T (T being the thickness of the component) away from the component on integral

attachments and the entire attachment end and bolting of the support for non integral attachments and extending to the face of the building steel or concrete. A typical sketch is provided in Figures 4 and 5 to aid in interpretation. This note is provided as general guidance to rules provided in 3.2.1 and 3.2.3.

3.2.3 Examination area may be defined by specific plant engineering drawings, procedures or instructions. When this occurs, the examination area shall be as defined by the plant.

3.2.4 The building, if structural steel was used solely for the support.

3.2.5 Structural steel for all other cases.

3.3 The examination area for the internal surfaces of the reactor pressure vessel includes the space above and below the reactor core that is made accessible for examination by the removal of components during normal refueling outages.

3.4 The following service facilities and equipment should be furnished by plant personnel to facilitate the performance of examinations in accordance with this procedure; prior agreement between plant and inspection unit should establish details;

3.4.1 Scaffolding

3.4.2 Air, electricity and water

3.4.3 Adequate temporary lighting

3.4.4 Moving or lifting devices

3.4.5 Test surface preparation

3.4.6 Pressure gauges and sensors, as required for system pressure tests

3.4.7 Various tools, as required for disassembly of components

3.4.8 Post-examination clean-up

3.5 Inspection personnel shall observe good health physics practices when inspection is required inside a radiation control area to maintain radiation exposure as low as reasonably achievable (ALARA).

4. REFERENCES

4.1 This procedure meets the requirements of ASME Section XI, 1986 Edition with no addenda.

5. PERSONNEL

5.1 Personnel performing the visual examination shall be certified as a Level II, VT-3 and 4, or Level III Examiner in accordance with NES Procedure 80A9069, Certification of Visual Examination personnel. In addition, the CP&L Level III may provide training to familiarize personnel with specific plant or periodic procedures.

5.2 In addition, the personnel performing the visual examination shall be knowledgeable regarding the function of the component being examined and be able to identify objectionable indications relative to that component or support.

6. EQUIPMENT

6.1 Illuminators, mirrors, and/or instruments meeting the requirements of paragraph 7.2, may be used to aid in performing examination.

6.2 When illuminators, mirrors or other instruments are used to improve the angle of vision and/or resolution, care must be taken to insure that the equipment does not shadow an area of interest or otherwise hinder the examination.

7. PROCESS

7.1 CLEANING

Visual examinations which require clean surfaces or decontamination for valid interpretation of results shall be preceded by a cleaning process performed in accordance with an approved procedure.

7.2 METHOD

7.2.1 Examination may be performed either remotely with optical aids or directly as access will allow.

7.2.1.1 Unaided visual examination may be performed when the combination of resolution, access and angles of vision can clearly resolve the smallest abnormal condition required to be reported for the given item, part and/or component being examined.

7.2.1.2 Remote visual examination may be performed where access does not permit unaided visual examination. Remote visual examination may include aids such as telescopes, periscopes, boroscopes, fiberoptics, or TV cameras and monitoring systems, with or without attachments for permanent recording. Mirrors, movable lights or rotating optics, or any combination thereof, may be employed. Such systems shall have a resolution capability at least equivalent to that obtainable by unaided visual examination. Remote underwater systems must resolve a .001 inch diameter wire, both horizontally and vertically with respect to the system and over the entire range of distances used during the examination.

7.3 REPLICATIONS

7.3.1 Surface replication methods shall be considered acceptable provided the surface resolution is at least that obtainable by visual observation.

7.3.2 Replication materials and applicable procedures to be used shall be approved by a VT Level III.

8. SPECIFIC EXAMINATION ITEMS

8.1 Appendix A to this procedure provides specific examination items in accordance with ASME Section XI, 1986 Edition with no addenda.

9. DATA AND REPORTING

9.1 Conditions found during the examination which exceed the limits specified in acceptance criteria or reporting criteria in Appendix A shall be recorded.

9.2 The data sheet contained in the periodic test (PT or EST) procedure shall be completed to record the results of the examinations and to identify the observed abnormalities. When the PT does not contain a data sheet, an examination report shall be completed.

9.3 **INFORMATION RECORDED SHALL IDENTIFY THE COMPONENT AND AREA EXAMINED, NATURE OF THE OBSERVED ABNORMALITY, LOCATION OF ABNORMALITY ON COMPONENT AND ITS LENGTH, WIDTH AND DEPTH, IF DEPTH IS DETERMINABLE.**

THE REPORT SHOULD ALSO INCLUDE, IN THE COMMENTS SECTION ON THE REPORT, A DESCRIPTION OF ANY PARTS NOT IDENTIFIED ON THE SKETCH OF THE SUPPORT INCLUDING THE LOCATION OF THE PART. A SKETCH MAY BE USED TO ASSIST IN IDENTIFYING EXTRA PARTS.

9.4 For areas where erosion, corrosion, or wear is observed, it may be prudent to supplement the recorded data with photographs and/or sketches. When photographs are used for documentation, a benchmark shall be included in the photograph to provide a scale of relative size.

9.5 When performing underwater remote visual examination of reactor pressure vessel internal areas, a videotape **AND** accurate voice recording to supplement the documentation (if required by the plant) shall be made of abnormalities encountered during the examination.

9.6 Data shall be recorded on the following CP&L forms, or other approved CP&L forms:

9.6.1 QA NDE ISI 1 – Visual Examination Data Sheet for Snubbers

9.6.2 QA NDE ISI 2 – Visual Examination Data Sheet for Valves

9.6.3 QA NDE ISI 3 – Visual Examination Data Sheet for Pumps

9.6.4 QA NDE ISI 5 – Visual Examination Data Sheet for Components and Component Supports

9.6.5 QA NDE ISI 7 – Visual Examination Data Sheet for External and Interior Surfaces

9.7 The examination report shall contain the following information as a minimum:

9.7.1 Unit identification

9.7.2 Component identification

9.7.3 Examination procedure and revision number

9.7.4 Date of Examination

9.7.5 Equipment used for visual aids, if any

9.7.6 Replication materials used, if any

9.7.7 Examination results including detailed location, size (length, width and depth, as applicable) of observed indications

9.7.8 Signature of personnel who performed the examination

9.7.9 Comments, as required

9.7.10 Signature of reviewer (if required by plant procedures)

Note: Photographs can ultimately reduce radiation exposure (ALARA) and should be considered where practical in assisting documentation of a discontinuity. Remember to use a benchmark to show relative size in the photograph.

10. REVIEW OF DATA AND EVALUATION OF INDICATIONS

10.1 Final evaluation and disposition of the recorded abnormal conditions will be evaluated on a case by case basis by engineering and disposed of as provided in ASME Section XI IWF 3000.

10.2 Visual examinations that detect surface flaws shall be supplemented by either surface or volumetric examinations as directed by Engineering or ISI.

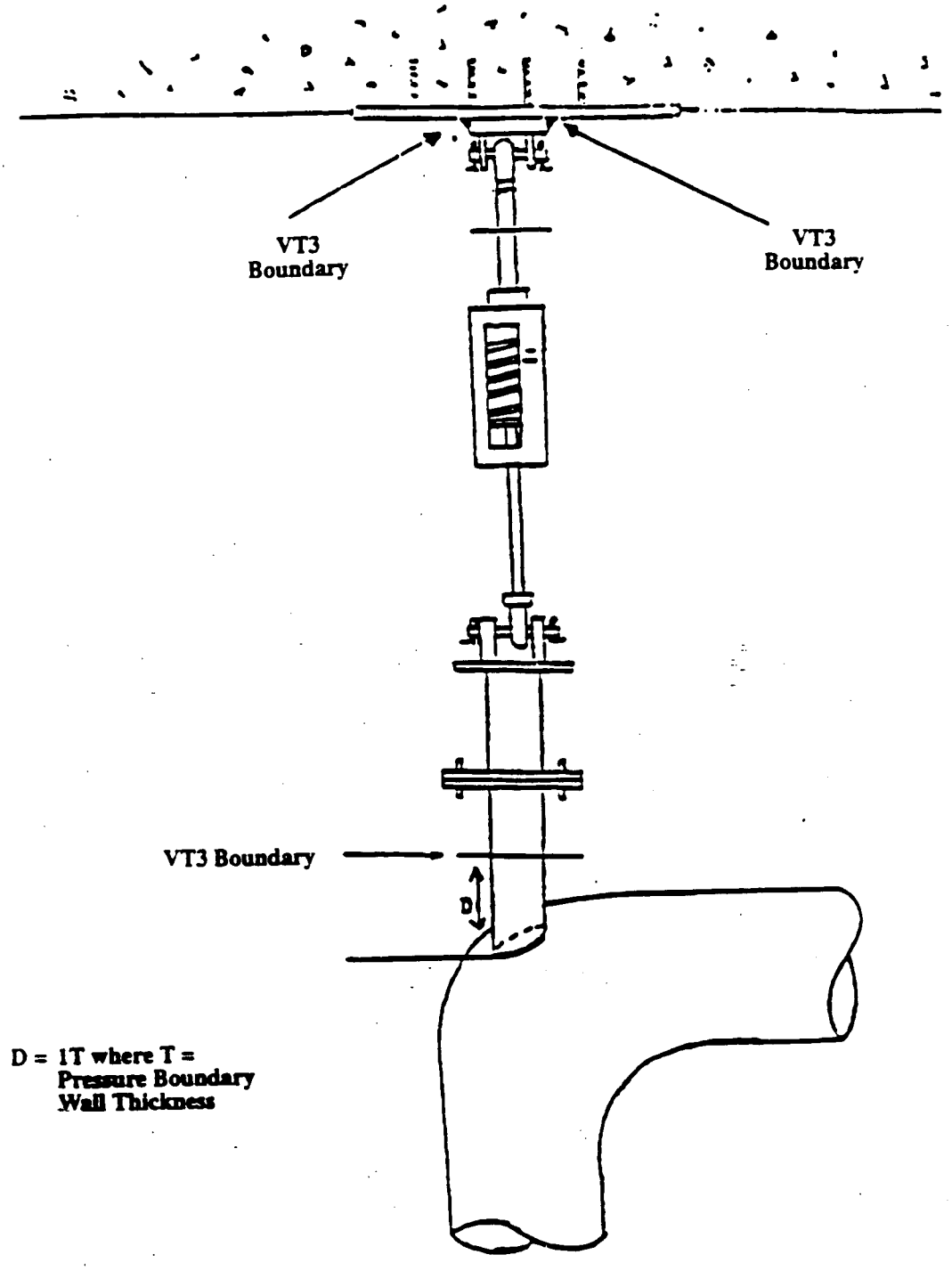


FIGURE 1

ILLUSTRATION OF TYPICAL SUPPORT EXAMINATION BOUNDARIES FOR INTEGRAL ATTACHMENT 1

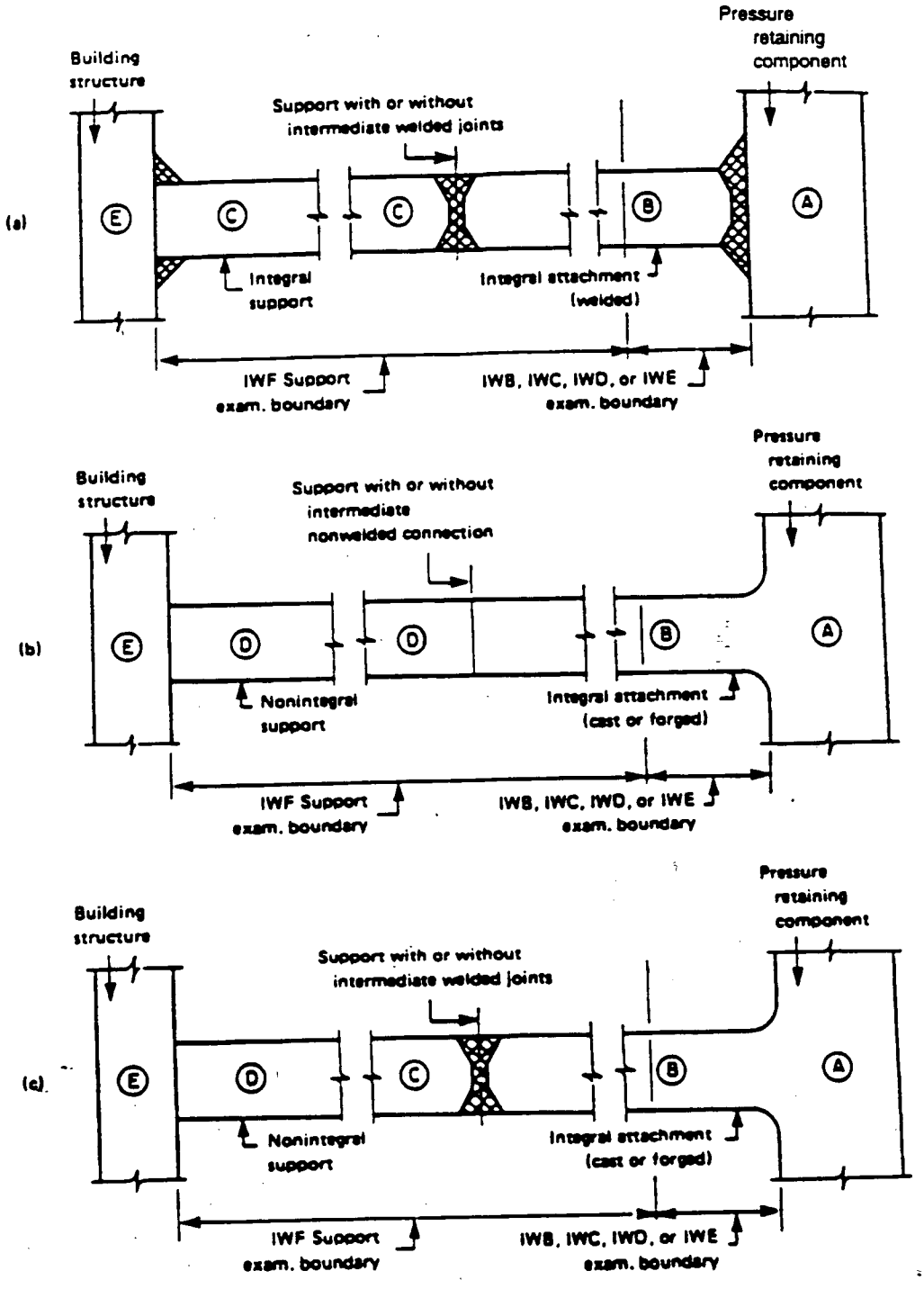


FIGURE 2

ILLUSTRATIONS OF TYPICAL SUPPORT EXAMINATION BOUNDARIES

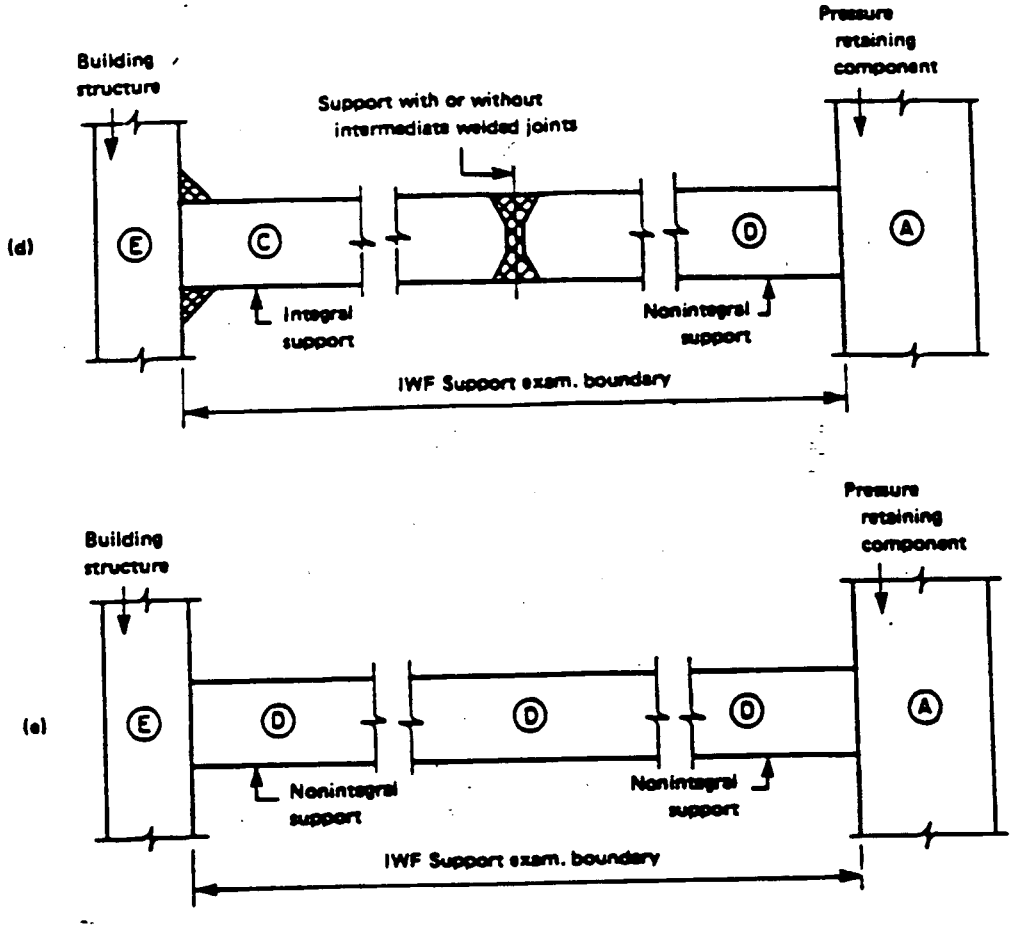


FIGURE 3

ILLUSTRATIONS OF TYPICAL SUPPORT EXAMINATION BOUNDARIES (CONT'D)

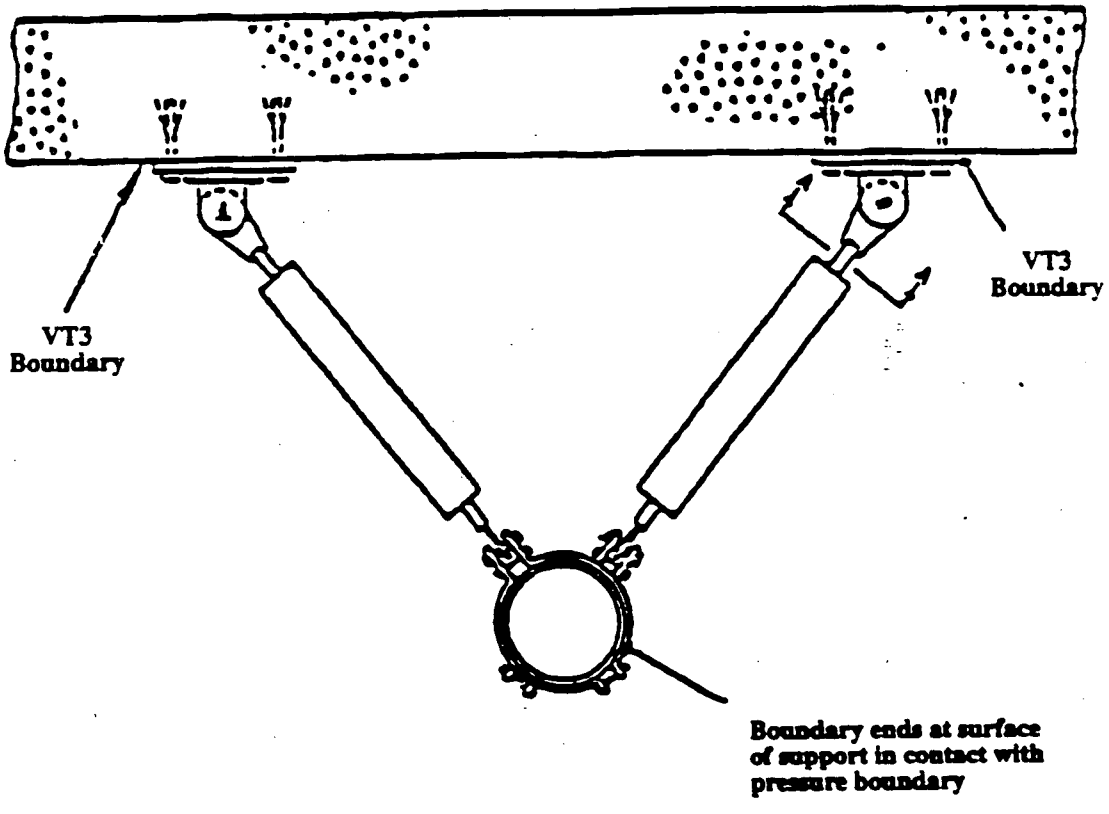

VT3
Boundary
VT3
Boundary
Boundary ends at surface
of support in contact with
pressure boundary

FIGURE 4

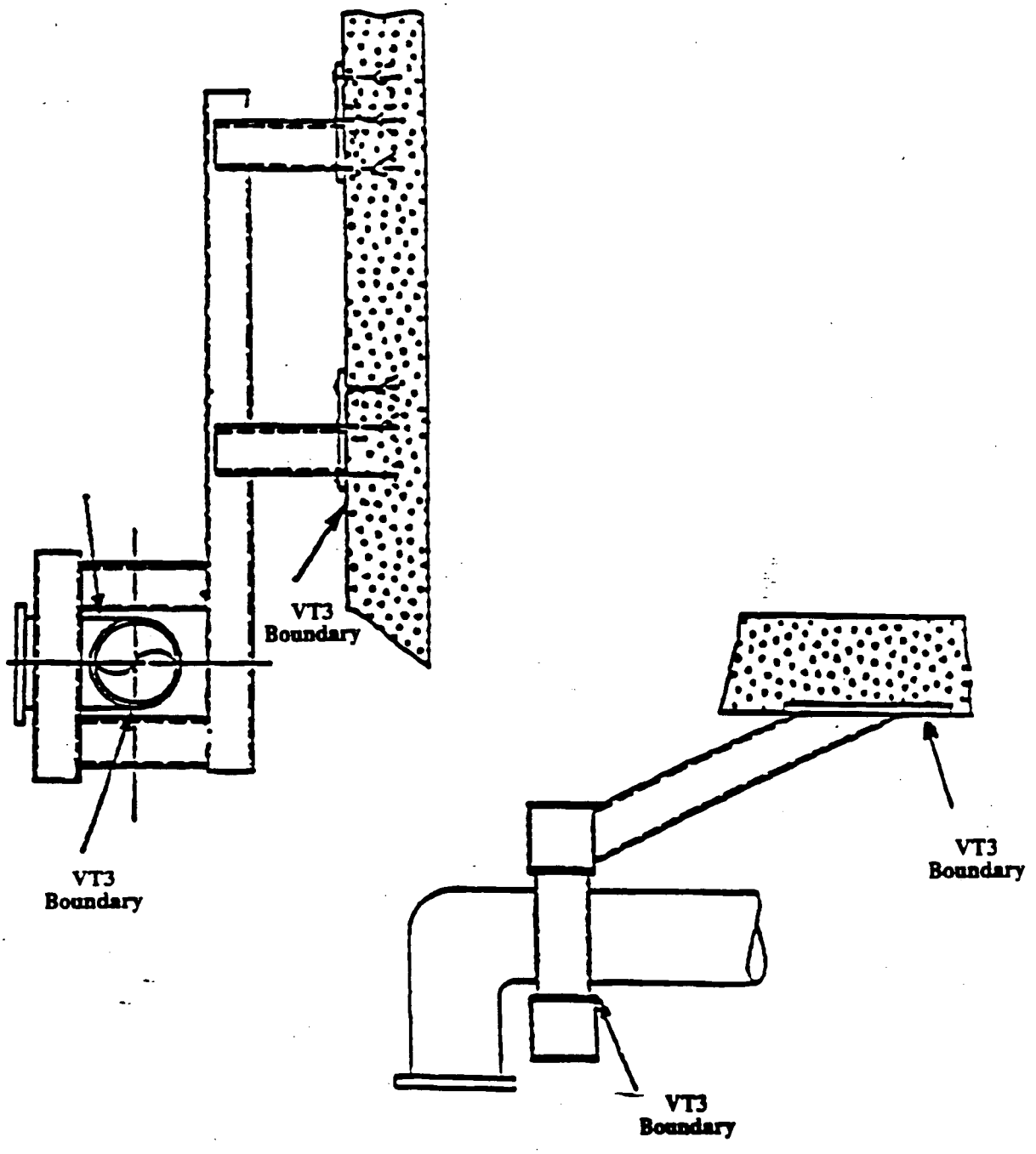


FIGURE 5

APPENDIX A

1. SCOPE

1.1 This appendix provides specific examination items in accordance with ASME Section XI, 1986 Edition with no addenda.

2. REFERENCES

2.1 This appendix meets the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1986 Edition with no addenda.

3. SPECIFIC EXAMINATION ITEMS

3.1 COMPONENT SUPPORTS AND MECHANICAL/HYDRAULIC SNUBBERS

3.1.1 A general VT-3 examination shall be performed to determine the operability and the general mechanical and structural condition of the support. The following acceptance criteria shall be used to evaluate the acceptability of the support.

3.1.1.1 Visible indications of damage, deformation, or structural degradation (such as bent, twisted or broken support members; areas of heavy rust, metal loss due to erosion, corrosion or wear; or cracked welds) are not acceptable.

3.1.1.2 Missing,detached,or loosened support items are not acceptable.

3.1.1.3 The tolerance for variable spring support hot/cold position shall be ± 10% from the specified setting or ± 1/8 inch for load scales graduated in inches. If the unit is found to be "topped" or "bottomed" out, these conditions will be noted on the VT report.

3.1.1.4 Mechanical interferences which would impair spring movement are not acceptable.

3.1.1.5 The tolerance for constant spring support setting shall be ± 1 increment from the hot/cold position marker.

3.1.1.6 Loose or missing jamb (lock) nuts against turnbuckles or other locations denoted in drawings are not acceptable.

3.1.1.7 Missing or unbent cotter pins are not acceptable.

3.1.1.8 Misaligned support components (e.g., binding paddles) are not acceptable.

3.1.1.9 Arc strikes, weld spatter, paint (unless specified by design) scoring, roughness, or general corrosion on close tolerance machined or sliding surfaces and snubber shafts are not acceptable.

3.1.1.10 Bolting pulled out from anchorage is not acceptable. This will be indicated by large gaps between baseplate and concrete (> 1/4"). This does not apply to the area directly under the bolting. The base plate and the concrete must be in contact in the area under the bolting. Particular attention should be directed to this interface as gaps are a prime indicator of inservice problems.

3.1.1.11 A missing support identification tag is not a ISI VT-3 indication, but should be noted on the VT report.

3.1.1.12 The following are nonrelevent conditions which shall be considered satisfactory: (see 3.1.1.10 above)

3.1.1.12.1 Fabrication marks, hammer marks, mishandling marks, scratches, and surface abrasions (other than those on snubber shafts).

3.1.1.12.2 Chipped or discolored paint (unless it is evidence of contact during service).

3.1.1.12.3 Weld spatter on other than sliding surfaces.

3.1.1.12.4 General conditions acceptable by material, design or construction specifications.

NOTE 1: The examination boundary extends from the building, foundation, or intervening structure connection to the pressure retaining component attachment. Support steel designed to transmit loading to the building, foundation or an intervening structure is included in the examination boundary. Specific

3.5.1 The swivel bearing is damaged, bound (i.e., does not exhibit freedom of motion) or is disengaged.

3.5.2 Damaged or missing insulation which covers or partially covers mechanical connections and pipe clamps (one pipe diameter up and down stream of support).

3.6 The following specific areas shall be examined by a VT–3 visual examination to determine the integrity of the connection. Cracked welds are not acceptable.

3.6.1 Welded connections to the building structure.

3.6.2 Welded connections at intermediate joints in multiconnected supports.

3.6.3 Welded connections to pressure retaining components.

3.7 REACTOR VESSEL

3.7.1 The space above and below the reactor core that is made accessible by the removal of components during normal refueling outages shall be subjected to a VT–3 examination. Also, accessible welds of interior attachments beyond the beltline region shall be examined.

3.7.2 Accessible surfaces of the core support structure shall be examined.

3.7.3 All abnormal conditions as listed below shall be recorded.

3.7.3.1 Structural distortion or displacement of parts;

3.7.3.2 Loose, missing, cracked or fractured parts, bolting,

3.7.3.3 Foreign materials or accumulation of corrosion products,

3.7.3.4 Corrosion or erosion that reduces the nominal section thickness,

3.7.3.5 Wear of mating surfaces

3.7.3.6 Structural degradation of interior attachments such that the original cross–sectional area if reduced.

3.8 APPLICATIONS

3.8.1 Accessible surface includes examinations of the spaces above and below the reactor core that are made accessible for examination by removal of components during normal refueling outages.

examination points include, but are not limited to, those areas designated in the procedure. Guides may require measurement using feeler gauges to determine that the clearance between the guide and the pressure retaining component is within tolerances indicated on the detail drawing if structural degradation/deformation is suspected.

NOTE 2 : When a visual examination is required as a result of rework on a support, the rework area only is required to be examined. If the extent of the rework area is not determinable, the support shall be reexamined completely.

3.2 EXAMINATION OF INSULATED SUPPORTS

3.2.1 Pipe clamps (with the exception of the bolting and associated pins) are not required to be visually inspected. However, any apparent clamp damage or deformation shall be noted on the Visual Examination report. Special care should be taken in cases where these clamps are insulated to note any deformation of the insulation around the clamp or bending in exposed clamp ears. This condition may indicate deformation of the associated pipe clamp. This condition shall be reported to ISI for determination of insulation removal for further pipe clamp examination.

3.2.2 Insulation shall be removed from pipe clamp bolting and pins for component supports required to be examined.

3.3 Perform a VT–3 examination on each component support scheduled or required to be inspected.

3.4 Record the load settings of the support (where applicable) as follows:

3.4.1 Variable spring hangers. Determine readings using bottom edge of lad bar.

3.4.2 Constant spring hangers. Determine readings based on straight lines drawn through main pivot.

3.5 Snubber shaft which is bent and has conditions that could resist shaft stroking is <u>not acceptable</u>. Snubber shaft shall be free of weld spatter, paint, or roughness that could affect shaft movement. Imperfections such as pits. gouges, burrs, corrosion and arc strikes on snubber shaft are <u>not acceptable</u>.

3.8.2 The core support structure shall be removed from the reactor vessel for examination, as applicable.

3.8.3 The beltline region extends for the length of the vessel thermal shielding, or in the absence of a thermal shield, the effective length of reactor fuel elements and is performed as a VT-1 examination.

3.9 PUMPS AND VALVES

3.9.1 Inspect components designated by Tech Support/ISI. Internal surfaces of pump casings and 100% of the length of all welds requiring VT-3 shall be examined.

3.9.2 The following conditions shall be recorded:

3.9.2.1 Corrosion or erosion that reduces the thickness of the pressure retaining wall.

3.9.2.2 Wear of mating surfaces that may lead to loss of function or lead to leakage.

3.9.2.3 Crack like surface flaws.

3.9.2.4 Other conditions interfering with pump or valve function or operability (e.g., excessively loose or worn parts, etc.).

4. DATA, RECORDING, REVIEW AND INDICATION EVALUATION

Examination results shall be documented and evaluated in accordance with paragraphs 9.0 and 10.0 of this procedure.

11.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1235

ULTRASONIC INSTRUMENT LINEARITY VERIFICATION

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9/1/93

Expiration Date 2/28/94

RECOMMENDED BY: _____ 8/23/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 24AUG93
Manager, Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 13	0

ULTRASONIC INSTRUMENT

LINEARITY VERIFICATION

9

Project Application	Copy No.	Assigned To
Implementing	375	Mr. Ian Simpson - H.B. Robinson

APPROVALS

TITLE / DEPT. - SIGNATURE - DATE

REV NO	PREPARED BY	LEVEL III	EXECUTIVE VICE PRESIDENT	QA MANAGER	
0					
1					
2					
3					
4					
5					
6					
7					
8					
9	M. Shakinovsky	12-6-91	12-6-91	12-06-91	
10					
11					

FORM # NES 204 3/90

REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 80A9053

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	9/14/79	All	CRA 1041 (Section 3.1, 4.0, Figure 2)	
2	9/24/80	3,5	CRA 1413 (Sections 3.2.4, 4.2.4, 4.2.6)	
3	9/27/83	All	CRA 3502 (Sections 1 thru 8, Figures 1 and 2)	
4	8/15/85	3,4	CRA 5615 Provide for instruments to be removed	
		5,6	from service, address automated equipment	
5	10/22/86	4	CRA 6328–Remove Level I authority to independently	
			perform linearity checks	
6	6/3/88	All	CRA 6828 Extensive Revision and Addenda to	
			update and clarify procedure	
7	6/16/88	4	Para. 6.A & B Correct error	
8	10/6/88	4	Para 6.2.B, 6.3, 6.4; Sect. 7, Note revised as per	
			CRA 7078	
9	12/6/91	All	See CRA 8203 – extensive revision	12/6/91

FORM # NES 206 3/90

1. OBJECTIVE

This document delineates the frequency of performance and the technique whereby ultrasonic instruments in active use may be evaluated for functional linearity.

2. GENERAL

Screen Height, Amplitude Control and Horizontal linearity shall be verified at the beginning and end of an outage and/or every 90 days as a minimum, while in use.

Screen Height and Amplitude control Linearity shall also be verified as specified by referencing examination procedures.

When special equipment is used, intermediate linearity will be verified by methods unique to each specific system as outlined in the specific systems governing procedure.

NOTE: In the event of damage to the equipment prior to performance of the "end of outage" verification, the verification conducted in accordance with specific examination procedures is acceptable documentation in lieu of the "end of outage" verification

3. RESPONSIBILITIES

The cognizant department manager shall ensure that appropriate personnel (e.g., Site Supervisor or Equipment Manager) implement this procedure.

4. REFERENCES

1. ASME Boiler and Pressure Vessel Code, Section V.
2. ASME Boiler and Pressure Vessel Code, Section XI.

5. DEFINITIONS

5.1 AMPLITUDE CONTROL LINEARITY VERIFICATION

The determination that the change in signal amplitude as selected with the "gain" control is consistent with the change noted on the Cathode Ray Tube (CRT).

5.2 SCREEN HEIGHT LINEARITY VERIFICATION

The determination that the signal amplitude difference between two signals observed on the CRT remains consistent throughout the dynamic range (in use) of the instrument.

5.3 HORIZONTAL LINEARITY VERIFICATION

The determination tha tthe system responds in a proportional manner to a range of echo signals along the time base (sweep).

6. REQUIREMENTS

1. Linearity verifications shall be performed by a Level I, II, or III examiner certified in Ultrasonic Examination (UT). A Level I trainee may perform the linearity verification under the supervision of a Level II or III examiner.

2. For ultrasonic systems that utilize changeable pulser/receiver(s), a linearity check shall be performed for each pulser/receiver. The check shall be performed each time these components to the system are changed.

7. EQUIPMENT

1. The Pulse Echo ultrasonic instrument to be verified.

2. Calibration blocks – International Institute of Welding (IIW), miniature angle beam, or any convenient calibration block that will provide the necessary reflectors as follows:

   A. For verification of amplitude control linearity, only one signal is required.

   B. For Screen Height linearity, reflectors that will allow signals whose amplitudes may be adjusted by transducer placement to a ratio of 2:1.

   C. For Horizontal linearity, a block that will provide clear back–surface reflections to enable the performance of the verification as required in paragraph 8.1.

   D. Where applicable an electronic signal generator capable of producing a display on the UT instrument of two signals whose amplitudes can be adjusted to a ratio of 2:1.

3. Search unit 0° (any convenient size and frequency).

4. Search unit Angle beam any convenient size, frequency, and angle.

8. PROCEDURE

NOTE: Since linearity can be affected by the use of "REJECT" during the verifications, the reject control shall be in the "Off" or "Minimum" position as applicable.

All signal heights and horizontal positions shall be read and recorded to the nearest 1% of full screen height.

8.1 HORIZONTAL LINEARITY

The instrument's ability to provide a linear horizontal display may be verified as follows:

1. Place the 0° search unit on the appropriate surface of the calibration block and adjust the instrument controls to obtain clear multiple back surface reflections.

2. Adjust the "DELAY" control to align the leading edge of the first Back Reflection (BR) with the number 1 CRT graticule.

3. Adjust the "SWEEP" (fine range) control to align the leading edge of the tenth BR with the number 10 CRT graticule position.

4. Repeat steps 2 and 3 until the first BR is aligned at position "one", and the tenth BR multiple, with position "ten".

5. Record the position of the leading edge of each BR on the appropriate form (Exhibit 1).

6. To be considered acceptable, the signals should coincide with each of the ten numbered screen divisions within ± 5% of nominal.

8.2 SCREEN HEIGHT LINEARITY

The instruments ability to provide a linear vertical display may be verified as follows:

1. Position a search unit (Angle Beam or 0°) on the calibration block so that two signals can be observed on the CRT.

2. Adjust the search unit position to display a 2:1 ratio of amplitudes between the two signals, with the larger at 80% of full screen height (FSH).

3. Without moving the search unit, adjust the "GAIN" (sensitivity) control to successively set the larger signal from 100% down to 20% of FSH, in 10% increments or in 2dB steps if a fine gain control is not available.

4. Record the amplitudes of both signals at each increment on the appropriate form (Exhibit 1) 9 points in all.

5. The smaller signal amplitude shall be half the amplitude of of the larger signal, within ± 5% of FSH, to be considered linear.

6. The instrument shall provide a linear vertical presentation (within 5% FSH) for at least 80% of the screen height (sweep line to top of screen).

8.3 AMPLITUDE CONTROL LINEARITY

The accuracy of the calibrated amplitude control may be verified as follows:

1. Set any signal to 80% FSH.

2. Decrease amplitude by 6dB. The signal amplitude shall fall within the specified limits of 32% to 48% of FSH.

3. Decrease amplitude by an additional 6 dB. The signal amplitude shall fall within the specified limits of 16% to 24% of FSH.

4. Set the same (or any other) signal to 40% of FSH.

5. Increase the amplitude by 6dB. The signal amplitude shall fall within the specified limits of 64% to 96% of FSH.

6. Set the same (or any other) signal to 20% of FSH.

7. Increase amplitude by 12dB. The signal amplitude shall fall within the specified limits of 64% to 96% of FSH.

8. Record the signal responses on the appropriate form (Exhibit 1).

8.4 DYNAMIC RANGE

(For "90 day" or "beginning/end of outage" linearity checks only)

When conducting the following verification, the signal amplitude must fall within the specified limits of 64% and 96% FSH.

Instruments with coarse gain controls of 20 dB increments shall have the coarse gain control evaluated as follows:

a) Place the search unit (Angle Beam or 0°) on the calibration block and set any signal to 80% FSH with the Coarse Gain set at 0 dB and the Fine Gain control set at 20 dB.

b) Without changing the signal in step (a) set the Coarse Gain to 20 dB and the Fine Gain at 0 dB. Note the signal amplitude.

c) Set any signal to 80% FSH with the Coarse Gain control at 0 dB and the fine Gain control at 40 dB.

d) Without changing the signal in step (c), set the coarse Gain to 20 dB and the fine Gain to 20 dB. Set the Coarse Gain to 40 dB and the fine Gain to 0 dB. Note the signal amplitude.

e) Set any signal to 80% FSH with the Coarse Gain set at 60 dB and the Fine Gain at 0 dB.

f) Without changing the signal in step (e), set the Coarse Gain to 40 dB and the Fine Gain to 20 dB. Set the Coarse Gain to 20 dB and the Fine Gain to 40 dB and note the amplitude.

g) Set any signal to 80% with the Coarse Gain at 80 dB and the Fine Gain at 0 dB.

h) Without changing the signal in step (g), set the Coarse Gain to 60 dB and the Fine Gain to 20 dB. Set the Coarse Gain to 40 dB and the Fine Gain to 40 dB and note the amplitude.

i) Set any signal to 80% FSH with the Coarse Gain set at 100 dB and the Fine Gain set at 0 dB.

j) Without changing the signal in step (i), set the Coarse Gain to 80 dB and the Fine Gain to 20 dB. Set the Coarse Gain to 60 dB and the fine Gain to 40 dB and note the amplitude.

k) The specific results of the measurements in 7.4 above need not be recorded on the Ultrasonic Instrument Linearity Record (Exhibit 1), however the appropriate box shall be checked, annotating that the measurements were performed.

NOTE: Some of the steps in 7.4 may be omitted if the instrument has a smaller dynamic range, and additional steps may be added if the instrument has a larger dynamic range. For instruments with Coarse Gain controls with 10 dB increments, conduct the above measurements substituting 20 dB with 10 dB.

9. REPORTS – REPORTING FORMS

1. For Quarterly and beginning/end of outage verifications, the appropriate form shall be completed by the examiner, with "acceptance" or "non–acceptance" indicated (see Exhibit 1).

2. For verification specified by other procedures, the data obtained shall be recorded in the appropriate space on a data sheet, or in other permanent data storage.

3. All forms must be signed by a certified individual annotating the certification level.

10. ACCEPTANCE

When the instrument performs within the prescribed limits, as indicated in this procedure, it shall be considered acceptable. A new "Linearity Verification" sticker shall be affixed to the instrument and shall indicate the date of linearity verification, the examiner's identity, and the due date for the next linearity verification (other than end of outage). A new sticker is not required for daily verifications.

11. NONACCEPTANCE

When the instrument is removed from service for extended periods or fails to perform within the prescribed limits, as indicated in this procedure, it shall be tagged as "Out of Service". The existing

"Linearity Verification Sticker" shall be removed and the instrument shall not be returned to service until it performs within the prescribed limits and a new "Linearity Verification Sticker" has been attached.

12. STORAGE

Ultrasonic instruments located at the NES off–site offices shall be stored in segregated areas clearly labeled "Hold – Do Not Use Until Linearity is Verified."

Ultrasonic Instrument Linearity Record

Ultrasonic Instrment:

Make _____ Model # _____ Serial # _____

Transducer: 0° Angle Beam _____

Freq. _____ Size _____ Serial # _____ Serial # _____

Calibration Standard: _____

Horizontal Linearity

Back Reflect.	Grid Loc.	Actual Loc.
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

Screen Height Linearity Signal Amplitude in % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	
2	90	45	(50) – (40)	
3	80	40	(45) – (35)	
4	70	35	(40) – (30)	
5	60	30	(35) – (25)	
6	50	25	(30) – (20)	
7	40	20	(25) – (15)	
8	30	15	(20) – (10)	
9	20	10	(15) – (05)	

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

SAMPLE ONLY
SIMILAR VERSIONS WHICH
REQUIRE THE SAME
INFORMATION ARE ACCEPTABLE

Amplitude Control Linearity

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6		32% – 48%
80% FSH	Down 12		16% – 24%
40% FSH	Up 6		64% – 96%
20% FSH	Up 12		64% – 96%

Gain Control Full Range Checked: ☐ Yes ☐ No

This Instrument is Considered: ☐ Acceptable ☐ Not Acceptable

Examiner _____ ID _____ Level _____

Date _____

Reviewed by _____ ID _____ Level _____

Date _____

EXHIBIT 1

13.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1237

VT-1 VISUAL EXAMINATION OF NUCLEAR POWER PLANT COMPONENTS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9/3/93

Expiration Date 3/2/94

RECOMMENDED BY: _____ 8/26/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 27AUG93
Manager - Technical Support — Date

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 19	0

VT-1 VISUAL EXAMINATION

OF

NUCLEAR POWER PLANT COMPONENTS

Project Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	VT Level III	Project Mgr.	Dept. Mgr.	
0					
1					
2	Scott Larson	07-28-97	7-29-97	7-29-97	
3					
4					
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REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6161

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	3/3/92	3,4,7,	Revise to delete references to CP&L procedures	
		11,13	Refer to CRA 8290	
		&15		
2	7/28/93	All	Extensive Revision per CRA No. 8670	07-28-93

VT-1 VISUAL EXAMINATION OF NUCLEAR POWER PLANT COMPONENTS

1. PURPOSE

1.1 The purpose of this procedure is to delineate the VT-1 visual examination criteria specified by ASME Boiler and Pressure Vessel Code, Section XI for pre-service and in-service visual examination of nuclear power plant components.

2. SCOPE

2.1 This procedure defines the general methods and requirements for VT-1 visual examination as specified in Section XI of the ASME Code. The examination is to be performed to determine the condition of the part, component, or surface examined including such conditions as cracks, excessive wear, corrosion, erosion, or physical damage on the accessible surfaces of the part or component.

2.2 When specific methods and details of examinations are defined in specific plant special procedures and/or periodic test procedures, those test procedures shall have been reviewed and approved by appropriate plant and/or CP&L Level III personnel. When such procedures are used, they shall be used in conjunction with this procedure in the performance of the examinations. Documentation shall be specified in the special or periodic test procedure.

Note: The above paragraph is applicable to BNP

2.3 When plant specifications or procedures require examinations to be performed in accordance with an approved VT- 1 procedure (with no specific details of the examination provided in the specification or procedure), this procedure and associated documentation shall be used.

Note: The above paragraph is applicable to RNP and HNP.

3. REFERENCES

3.1 This procedure meets the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1986 Edition, with no addenda, 1980

Edition, with addenda through Winter 1981 and 1983 Edition with addenda through Summer 1983, and IWB 3517 from the 1983 Edition, Winter 1984 Addenda.

3.2 Inspection and Enforcement (IE) Bulletin No. 80–13, Cracking in Core Spray Spargers, dated May 12, 1980.

4. PERSONNEL

4.1 Personnel performing the visual examination shall be certified as a Level II, VT–1 examiner or Level III Visual Examiner in accordance with NES Procedure 80A9069, Certification of Visual Examination Personnel. In addition, the CP&L Level III may provide training to familiarize personnel with specific plant or periodic procedures.

4.2 In addition, the personnel performing the visual examinations shall be knowledgeable regarding the function of the component being examined and be able to identify objectionable indications relative to that component.

5. GENERAL

5.1 The following service facilities and equipment should be furnished by plant personnel to facilitate the performance of examinations in accordance with this procedure; prior agreement between plant and inspection unit should establish details:

5.1.1 Scaffolding

5.1.2 Air, electricity and water

5.1.3 Adequate temporary lighting

5.1.4 Moving or lifting devices

5.1.5 Test surface preparation

5.1.6 Pressure gauges and sensors, as required for system pressure tests

Various tools as required for disassembly of components

5.1.7 Post–examination clean–up

5.2 Inspection personnel shall observe good health physics practices when inspection is required inside a radiation control area to maintain radiation exposure as low as reasonably achievable (ALARA).

6. EQUIPMENT

6.1 Illuminators, mirrors and/or other instruments, meeting the requirements of paragraph 7.5, may be used to aid in performing the examinations.

6.2 When mirrors or magnifying lenses are used to improve the angle of vision and/or resolution, care must be taken to ensure that the equipment does not shadow the area of interest or otherwise hinder the examination.

7. EXAMINATION

7.1 Appendix A provides specific examination items for ASME Section XI, 1986 Edition, with no addenda. 2

7.2 Appendix B provides the specific examination items for ASME Section XI, 1980 Edition, with addenda through Winter 1981.

7.3 Appendix C provides the specific examination items for ASME Section XI, 1983 Edition with addenda through Summer 1983, and IWB 3517 from the 1983 Edition with Addenda through Winter 1984. 2

7.4 CLEANING

7.4.1 Visual examinations which require clean surfaces or decontamination for valid interpretation of results, shall be preceded by a cleaning process performed in accordance with an approved plant cleaning procedure.

7.5 METHOD

7.5.1 Direct visual examination may be made when access is sufficient to place the eye within 24 inches of the surface to be examined, and at an angle not less than 30° to the surface being examined. Mirrors and magnifying lenses may be used to improve the

angle of vision and resolution. Lighting, natural or artificial, sufficient to illuminate the area to be examined is required. Resolution shall be considered adequate when the combination of lighting, access and angles of vision can resolve a 1/32 inch black line on an 18% neutral gray card (based on the photographic standard manufactured by Eastman Kodak Co., or equivalent) placed on the surface to be examined.

7.5.2 Remote visual examination may be substituted for direct visual examination where access does not permit direct visual examination. Remote visual examination may include aids such as telescopes, periscopes, borescopes, fiberoptics, or TV camera and monitoring systems, with or without attachments for permanent recording. Mirrors, movable lights or rotating optics, or any combination thereof, may be employed. Such systems shall have a resolution capability at least equivalent to that obtainable by direct visual examination. Remote underwater systems used to inspect RPV interior components must resolve a .001 inch diameter wire.

7.6 REPLICATION

7.6.1 Surface replication methods shall be considered acceptable provided the surface resolution is at least that obtainable by visual observation.

7.6.2 Replication materials and applicable procedures to be used shall be approved by a VT Level III.

8. DATA AND RECORDING

8.1 Imperfections or abnormal surface conditions as noted in the applicable appendix or as specified by plant procedures: visible on bolting, welds, base material component internals, or other surfaces shall be recorded. Special care shall be taken to record abnormalities observed on the valve seat and the pressure retaining surfaces of pumps and valves (e.g., The slightest nick or scratch on a disk seating surface may prevent complete valve shutoff and therefore should be recorded).

8.2 A separate visual examination report must be prepared for each type of component listing the areas that are examined and a description of the potential defect conditions. Information recorded shall describe the nature of the abnormality, location on component, and size (length, width, and depth as applicable).

8.3 Data shall be recorded on the appropriate CP&L form(s) as follows:

8.3.1 QA NDE ISI 2 – Visual Examination Data Sheet for Valves

8.3.2 QA NDE ISI 3 – Visual Examination Data Sheet for Pumps

8.3.3 QA NDE ISI 6 – Visual Examination Data Sheet for Nuts, Bolts, Studs and Washers

8.3.4 QA NDE ISI 7 – Visual Examination Data Sheet for External or Interior Surfaces

8.3.5 QA NDE ISI 8 – Visual Examination Data Sheet for Welds

8.3.6 Other form(s) as provided by CP&L.

8.4 Record on an appropriate examination form the following information, as a minimum:

- Project and unit identification
- Weld or item identification
- Examination procedure and revision number
- Date of examination
- Equipment used for visual aids, if any
- Replication materials used, if any
- Examination results, including detailed location of abnormal areas
- Signature and certification level of examiner
- Pertinent comments, if any
- Signature of reviewer (if required by plant procedures)

8.5 For areas where erosion, corrosion, or wear is observed, it may be prudent to supplement the recorded data with photographs or sketches. When photographs are taken, a benchmark shall be included in the photograph to provide a scale of relative size.

9. REVIEW OF DATA AND EVALUATION OF INDICATIONS

9.1 Evaluation of detected abnormal conditions or flaws shall be performed on a case by case basis by plant engineering to determine final disposition.

APPENDIX A

1. SCOPE

1.1 This appendix delineates the specific VT-1 visual examination requirements as identified by ASME Section XI, 1986 Edition, with no addenda.

2. GENERAL

2.1 This appendix is applicable for the VT- 1 visual examination of the following components (and other structures/components as required by ASME Section XI, 1986 Edition, with no addenda):

2.1.1 Pressure retaining bolting

2.1.2 RPV interior attachment welds

3. SPECIFIC EXAMINATION ITEMS

3.1 Pressure Retaining Bolting (1/4 inch to 8 inch diameter)

3.1.1 Bolting may be examined in place under tension, when the connection is disassembled, or when the bolting is removed.

3.1.2 The areas to be examined are the accessible areas of the stud, nut, washers, threads in base material, and flange ligaments. The bolting shall be examined to detect the presence of cracks and/or other physical damage that could render the bolting structurally inadequate. Particular attention should be given to the examination of the root of the threads of bolts/studs, nuts and base material.

3.2 <u>BWR Reactor Pressure Vessel Interior Surfaces</u>

3.2.1 The examination areas are as follows:

3.2.1.1 Guide rod support brackets

a) Full penetration welds of the bracket to the vessel wall;

b) Plug welds in the lower portion of the bracket;

3.2.1.2 Steam dryer support brackets

a) Full penetration weld(s) of the bracket to the vessel wall;

3.2.1.3 Feedwater wall bracket

a) Full penetration weld(s) of the bracket to the vessel wall;

3.2.1.4 Feedwater sparger

a) End pin keeper welds;

b) End bracket bolt welds;

c) Bearing bar tack welds;

d) Sparger tee welds;

3.2.1.5 Core spray header support

a) Full penetration welds;

b) Tack welds;

3.2.1.6 Core spray header welds

a) Cover plate weld;

b) Tee to header weld;

c) Elbow welds;

Note: Particular attention should be paid to the HAZ on either side of the horizontal pipe to elbow welds.

3.2.1.7 Core spray spargers

a) Upper spray header nozzle tack weld;

b) Lower spray header tack weld condition;

3.3 PWR REACTOR PRESSURE VESSEL PARTS AND COMPONENTS

The following examination areas shall be examined, as a minimum:

3.3.1 Closure washers

3.3.2 Bushings

3.3.3 Accessible welds and interior attachments

3.3.4 Bolting

3.3.5 Other components and areas as specified in the ISI inspection plan or as requested by plant.

4. DATA, RECORDING REVIEW AND INDICATION EVALUATION

4.1 The following relevant indications shall be recorded:

4.1.1 Crack like surface flaws on the welds joining the attachment to the vessel wall.

4.1.2 Structural degradation of the attachment welds such as erosion/corrosion or wear that reduces the cross section of the thickness of the bolting material.

4.1.3 Crack like surface flaws on bolting materials and evidence of erosion/corrosion of wear that reduces the cross section thickness of the bolting materials.

4.1.4 More than one deformed or sheared thread in the zone of thread engagement of bolts, studs, or nuts.

4.2 Examination results shall be documented, reviewed and evaluated in accordance with paragraphs 8.0 and 9.0 of this procedure.

APPENDIX B

1. SCOPE

1.1 This appendix delineates the specific VT 1 visual examination requirements as identified by ASME Section XI, 1980 Edition, with addenda through Winter 1981.

2. GENERAL

2.1 This appendix is applicable for the VT– 1 visual examination of the following components (and other structures/components as required by ASME Section XI, 1980 Edition, with addenda through Winter 1981):

2.1.1 Reactor closure washers, bushings, flange surfaces and bolting

2.1.2 Pressurizer nuts, bolts, studs, bushings, washers, and flange surface

2.1.3 Steam generator nuts, bolts, studs, bushings, washers and flange surface

2.1.4 Heat exchanger nuts, bolts, studs, bushings, washers and flange surface

2.1.5 Piping nuts, bolts, studs, bushings, washers and flange surface

2.1.6 Pump nuts, bolts, studs, bushings, washers and flange surface

2.1.7 Valve nuts, bolts, studs, bushings, washers and flange surface

2.1.8 Control Rod Drive (CRD) housing bolts, studs and nuts

2.1.9 BWR and PWR reactor vessel accessible welds on interior attachments within beltline region.

3. SPECIFIC EXAMINATION ITEMS

3.1 PRESSURE RETAINING BOLTING

3.1.1 Bolting may be examined in place under tension, when the connection is disassembled, or when the bolting is removed.

3.1.2 Bushings and washers greater than 2 inches in diameter will be examined.

3.1.3 Bolts and studs 2 inches and less in diameter will be examined.

3.1.4 Nuts will be examined.

3.1.5 Bolting for Class 1 components will be examined as outlined in paragraphs 2.1.1 through 2.1.9 and 3.1.1 through 3.1.4.

3.2 FLANGE SURFACES

3.2.1 Flange surfaces of Class 1 components will be examined upon connection disassembly.

3.2.2 Examination area includes 1 inch annular surface of flange surrounding each stud.

3.3 BUSHINGS AND THREADS IN FLANGE BASE MATERIAL

3.3.1 Bushings and threads in base material of flanges are required to be examined only when the connections are disassembled. Bushing may be inspected in place.

3.4 CRD HOUSINGS BOLTING

3.4.1 Bolts, nuts and studs in CRD housings will be examined when disassembled.

3.5 INTERIOR ATTACHMENT WELDS ON REACTOR VESSELS

3.5.1 Accessible welds on interior attachments within the beltline region on BWR and PWR reactor pressure vessels will be examined.

3.5.2 The vessel beltline region extends for the length of the vessel thermal shielding, or in the absence of a thermal shield, the effective length of reactor fuel elements.

4. DATA RECORDING. REVIEW AND INDICATION EVALUATION

4.1 Examination results shall be documented and reviewed in accordance with paragraphs 8.0 and 9.0 of this procedure.

APPENDIX C

1. SCOPE

1.1 This appendix delineates the specific VT– 1 visual examination requirements as identified by ASME Section XI, 1983 Edition, with addenda through Summer 1983.

2. GENERAL

2.1 This appendix is applicable for the VT–1 visual examination of the following items (and other structures/components when required by ASME Section XI, 1983 with addenda through Summer 1983):

2.1.1 Nuts, bolting, washers, bushings, flange surfaces, studs using the acceptance criteria called out in IWB 3517 from the 1983 Edition, Winter 1984 Addenda.

2.1.2 BWR and PWR reactor vessel accessible welds on interior attachments within beltline region.

3. SPECIFIC EXAMINATION ITEMS

3.1 PRESSURE RETAINING BOLTING

3.1.1 Bolting may be examined in place under tension, when the connection is disassembled, or when the bolting is removed.

3.1.2 Bushings and washers greater than 2 inches in diameter will be examined.

3.1.3 Bolts and studs 2 inches and less in diameter will be examined.

3.1.4 Nuts will be examined.

3.1.5 Bolting for Class 1 components will be examined as outlined in paragraph 2.1.1.

3.1.6 Pressure retaining bolting greater than two inches in diameter (B–G–1) shall be evaluated in accordance with site specific procedures.

3.2 FLANGE SURFACES

3.2.1 Flange surfaces of Class 1 components will be examined upon connection disassembly.

3.2.2 Examination area includes 1 inch annular surface of flange surrounding each stud.

3.3 BUSHING AND THREADS IN FLANGE BASE MATERIAL

3.3.1 Bushings and threads in base material of flanges are required to be examined only when the connections are disassembled. Bushing may be inspected in place.

3.4 CRD HOUSING BOLTING

3.4.1 Bolts, nuts and studs in CRD housings will be examined when disassembled.

3.5 INTERIOR ATTACHMENT WELDS ON REACTOR VESSELS

3.5.1 Accessible welds on interior attachments within the beltline region on BWR and PWR reactor pressure vessels will be examined.

3.5.2 The vessel beltline region extends for the length of the vessel thermal shielding, or in the absence of a thermal shield, the effective length of reactor fuel elements.

4. DATA RECORDING. REVIEW AND INDICATION EVALUATION

4.1 The following excerpt from ASME Section XI, 1983 Edition, Winter 1984 Addenda shall be used as "acceptance" criteria when performing VT-1 visual examination of bolting at the Brunswick Plant:

IWB-3517 Standards for Examination Category B-G-1, Pressure Retaining Bolting Greater Than 2 in. in Diameter and Examination Category B-G-2, Pressure Retaining Bolting 2 in. and Less in Diameter

IWB-3517.1 Visual Examination, VT-1. The following relevant conditions shall require correction prior to continued service:

a. crack-like indications that exceed the allowable linear indication standards of IWB-3515 below;

2

b. more than one deformed or sheared thread in the zone of thread engagement of bolts, studs, or nuts;

c. localized general corrosion that reduces the bolt or stud cross–sectional area by more than 5%;

d. bending, twisting, or deformation of bolts or studs to the extent that assembly or disassembly is impaired;

e. missing or loose bolts, studs, nuts or washers;

f. fractured bolts, studs, or nuts;

g. degradation of protective coatings as evidenced by chipped paint or rusted surfaces on bolting surfaces; or

h. evidence of coolant leakage near bolting.

The acceptance criteria apply to accessible surfaces of bolting when examined in place, and to all surfaces when bolting is removed for examination.

Relevant conditions do not include fabrication marks, scratches, surface abrasion, material roughness and any other indications acceptable by material, design and manufacturing specifications.

IWB–3515 Standards for Examination Category B–G–1, Pressure Retaining Bolting Greater Than 2 in. in Diameter

IWB–3515.1 Allowable Indications for Surface Examinations of Studs and Bolts. Allowable surface indications in vessel closure studs and pressure retaining bolting shall not exceed the following limits:

a. nonaxial indications 1/4 inch in length

b. axial indications 1 inch in length

4.2 Examination results shall be documented and reviewed in accordance with paragraphs 8.0 and 9.0 of this procedure.

10.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1239

ULTRASONIC EXAMINATION PROCEDURE FOR PRESSURIZER NOZZLES INNER RADIUS AREAS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 9/14/93

Expiration Date 3/13/94

RECOMMENDED BY: _____ 9/9/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 11SEP93
Manager - Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 23	0

ULTRASONIC EXAMINATION PROCEDURE

FOR

NOZZLE INNER RADIUS

AREAS

FOR

H.B. ROBINSON NUCLEAR PROJECT

Project Application	Copy No.	Assigned To

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	Level III	Director ISI		
0					
1	Scott Larson	Scott Larson 8-23-93	E Quillen 9-24-93		
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REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO. 83A6041

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	8/20/93	12	Per CRA #8693	Scott Larson

FORM # NES 206 3/90

1. PURPOSE

The purpose of this procedure is to define the techniques, recording criteria and equipment for ultrasonic examination of nozzle inner radius areas.

2. SCOPE

2.1 This procedure is limited to the manual examination of pressure vessel nozzle inner radius areas.

2.2 This procedure describes the ultrasonic examination from the vessel head or shell using a 70° shear wave.

3. REFERENCES

3.1 ASME B&PV Code, Section XI; 1986 Edition.

3.2 ASME B&PV CODE, Section V; 1986 Edition.

3.3 80A9053, NES Procedure for Ultrasonic Instrument Linearity Verification.

3.4 80A9068, NES Procedure for Certifying Nondestructive Examination Personnel.

3.5 83A6091, NES Procedure for PSI/ISI Examination Areas and Volumes.

4. PERSONNEL REQUIREMENTS

4.1 It is recommended that examination crews consist of at least two members. At least one member of each crew shall have a minimum certification of Level II. Evaluations shall be conducted by an examiner with a minimum certification of Level II.

4.2 A copy of each examiner's certification summary and current eye test shall be maintained on–site.

4.3 A copy of each examiner's certification summary and current eye test shall be submitted to the Plant Owner or his Agent, prior to performing examinations in accordance with this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 ULTRASONIC INSTRUMENT REQUIREMENTS

A pulse echo type ultrasonic flaw detection instrument which operates within the minimum frequency ranges of 1.0 MHz – 5.0 MHz shall be used. This shall be equipped with a stepped gain control calibrated in units of 2 db or less.

5.2 SEARCH UNITS

A. Search Units: 1.0 MHz to 2.25 MHz with an effective area of 1/4" to 1 1/8" diameter or rectangular.

B. Wedges: 70° shear wave.

C. Any additional angle wedges required for examination or evaluation.

NOTE: Where applicable, the measured angle shall be within ± 2° of nominal.

5.3 CABLE

Cables shall have appropriate connectors and may be any convenient length. Examinations shall be performed using the same cable as that used during the calibration.

5.4 COUPLANT

Ultragel – or couplant supplied by the Plant owner.

5.5 CALIBRATION BLOCK(S)

A. Calibration blocks shall be selected and provided by the Plant Owner and shall as a minimum, contain reflectors that enable calibration as required in Section 7 of this procedure.

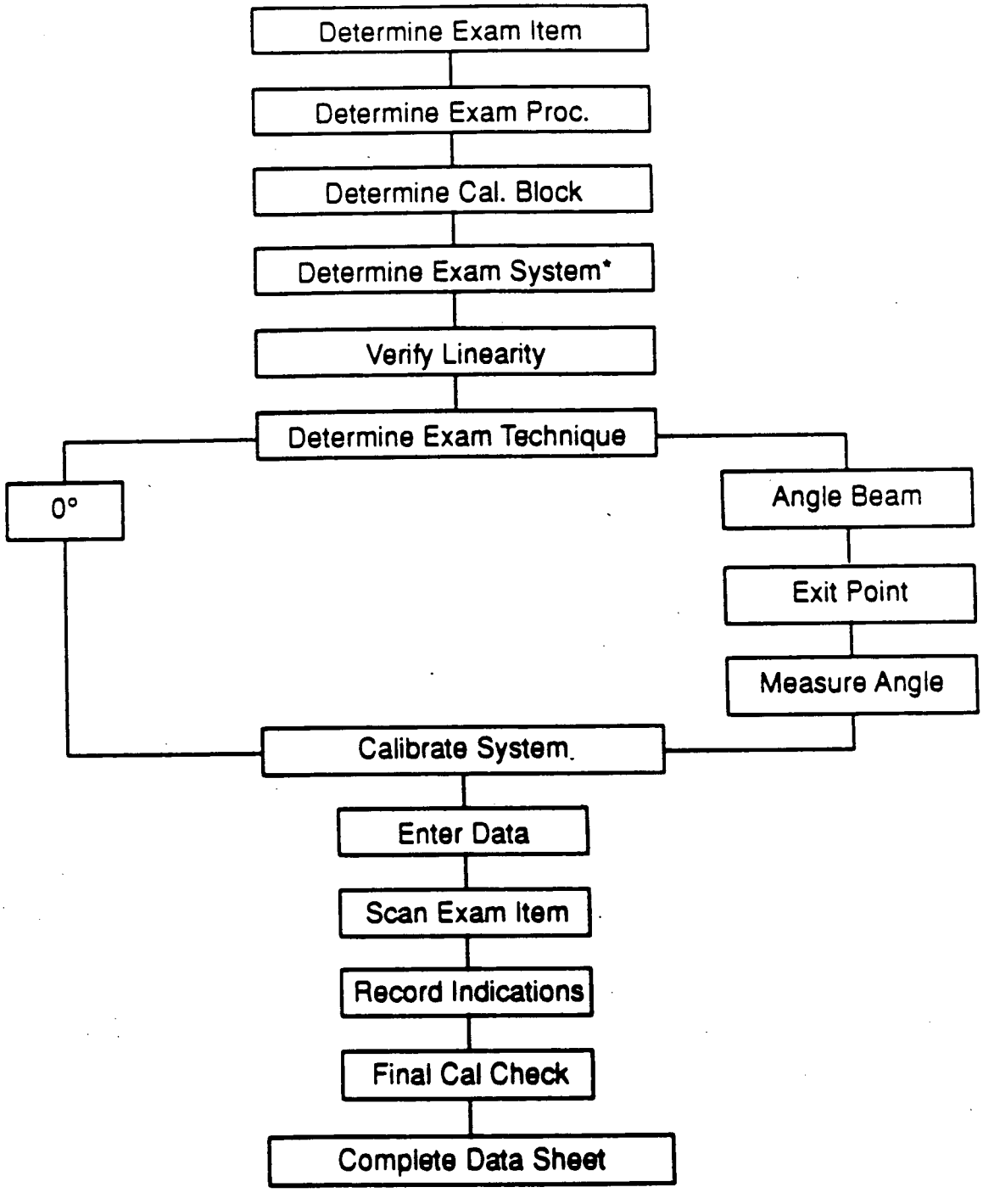
B. IIW Calibration Standards

These may be either full size or miniature IIW standards and shall be fabricated from Carbon Steel.

6. GENERAL PREREQUISITES

The following flow chart describes a typical examination sequence:

EXAMINATION SEQUENCE



*System = Instrument, Transducer, Wedges, and Cable.

6.1 The components to be examined shall be identified/determined by the plant owner.

6.2 Calibration blocks shall be selected and provided by the Plant Owner.

6.3 The component shall be prepared for examination by the Plant Owner, e.g. the examination surface shall be free of foreign matter which may interfere with Ultrasonic transmission.

6.4 Each weld to be examined shall be identified by the Plant Owner with reference points sufficient to locate the search unit along the weld seam.

NOTE: The examiner shall notify the NES "lead individual" or other designated contact individual when preparation of the scanning surface(s) and identification of reference points are not suitable for the ultrasonic examination.

6.5 Previous examination data provided by the Owner, shall be reviewed by the examiner and the following items should be identified:

(A) Interfering conditions

(B) Weld configuration

(C) Obstructions

(D) Recordable indications

(E) Previous examination technique

(F) Previously measured angle in the component

6.6 The required angle beam method of examination is the 1/2 Vee technique. Where conditions exist that interfere with the scanning of required examination volumes the examination technique shall be modified to examine the maximum volume possible.

NOTE: Modifications to any technique in this procedure shall be approved by a UT Level III. Documentation of this shall be attached to the Ultrasonic Calibration Data Sheet.

6.7 Linearity checks shall be performed in accordance with Reference 3.3 and shall be scheduled as follows:

(1) Screen height, amplitude control and horizontal linearities shall be verified at the beginning and end of each outage or every three months (while in use), whichever is less.

(2) Screen height and amplitude control linearities should be performed daily (while in use).

6.8 The calibration block surface temperature shall be within 25° F of the component to be examined.

7. CALIBRATION PROCEDURE

7.1 PREREQUISITES

A. Verify that the designated calibration block is correct for the specific item to be examined. Notify the NES "lead" or other designated individual, if a discrepancy is noted.

B. If the calibration block does not contain the reflectors required to perform the calibration techniques identified in this section, the Plant Owner shall be notified and the examination not performed.

C. Calibration shall be performed from the surface of the calibration block which corresponds to the component surface to be scanned.

D. The calibration shall be performed with the contoured or contact wedges used during the examination.

E. Dual Search Units

(1) When using dual search units, component thickness and focal distance shall be compatible. Compatibility is determined by the existence of a signal to noise ratio of at least 10:1 when scanning the ID notch in the component calibration block. Where this is not achievable, the UT LIII shall be notified and an explanation documented on the Ultrasonic Calibration Data Sheet (Figure 1).

(2) Half Vee techniques only, shall be used.

F. The search unit actual sound beam exit point shall be determined and marked on the wedge.

G. Measure the wedge exit point to–front–edge dimension and record in the Search Unit Remarks section on the Ultrasonic Calibration Data Sheet (Figure 1). Record as Exit Point to Front Edge: _____".

H. Maximum response from calibration reflectors shall be obtained with the sound beam essentially perpendicular to the axis of the calibration reflector. The center line of the search unit shall be at least 3/4" from the nearest side of the block or pipe. Rotation of the beam into a corner formed by the reflector and the side of the block may produce a higher amplitude signal at a longer beam path; this beam path shall not be used for calibration.

I. Measured beam angle shall be determined by using a Carbon Steel IIW Block or using the reflectors in the component calibration block. Note in the Search Unit

Remarks section on the Ultrasonic Calibration Data Sheet when a component calibration block and its identification number is used for search unit angle check(s).

J. Beam spread measurement shall be performed in accordance with Reference 3.2.

K. The examiner should avoid using a sweep calibration that uses only a small portion of the CRT presentation.

7.2 ANGLE BEAM CALIBRATION

Angle beam calibration shall be performed on the appropriate calibration block as follows:

A. The appropriate sweep calibration shall be established using inches of metal path, or by placing the calibration block reflector signals at convenient CRT positions using a linear sweep. Component thickness and area of interest will determine the correct sweep calibration.

B. Obtain a maximum response from the opposite surface code calibration notch and adjust sensitivity controls to provide a signal amplitude of 80% FSH and mark location and amplitude on the CRT. This is the primary reference sensitivity level. No. "DAC" is required.

C. Upon completion of calibration, ensure that all data and instrument settings are recorded on the Calibration Data Sheet (Figure 1).

D. To establish scanning sensitivity, position the search unit on the examination surface. Using the sensitivity control, adjust the cladding interface signal response level to 20% FSH. For nozzles without cladding, increase the gain a minimum of 6 dB for scanning. All indications shall be evaluated and recorded at the scan sensitivity.

7.3 PULSE REPETITION RATE AND SCANNING SPEED

A. To verify an acceptable pulse repetition rate and scanning speed a dynamic calibration at maximum scanning speed (not to exceed 6 inches per second) shall be used.

B. Verify that the basic calibration reflector in the appropriate calibration block are within $\pm$ 2dB of the static calibration response when scanned at scanning speed.

C. If the instrument to be used has an operator selectable/adjustable pulse repetition rate feature, then the repetition rate used shall be noted in the Instrument Remarks section on the Ultrasonic Calibration Data Sheet (Figure 1).

8. EXAMINATION PROCEDURE

NOTE: "System" = Instrument, Transducer, Wedges and same Cable type and length.

8.1 SYSTEM CALIBRATION

Perform the complete ultrasonic examination system calibration, establishing the DAC curve, within one day prior to use of the system for examination of those welds for which the calibration is applicable, and at least once each week during the examination, or at any time that any part of the system is changed.

NOTE: When necessary to replace a cable (even one of the same type and length) system calibration shall be verified. The verification may be delayed until after completion of the examination(s) in progress. However, the requirements of paragraph 8.2 concerning variations in DAC amplitude, sweep and reexamination shall apply.

8.2 SYSTEM CHECK

A. Verify the system calibration (instrument sensitivity and sweep range calibration) at the following intervals:

(3) At the start and finish of examinations for which the calibration applies.

(4) At intervals not to exceed 12 hours. (Recommended 4 hour intervals)

(5) With every change of examination personnel.

(6) If the examiner suspects any malfunction of the UT system.

B. If any point on the DAC curve has decreased 20% or 2db of its amplitude, all data sheets since the last calibration shall be made and recorded invalid. A new calibration shall be made and recorded and the affected examination areas re-examined.

C. If any point on the DAC curve has increased more than 20% or 2db of its amplitude, recorded indications taken since the last valid calibration shall be re-examined with the correct calibration and their values changed on the data sheets. The reason for the changed values shall be noted on the data sheet. No action is required where no recordable indications exist.

D. If any point on the DAC curve has moved on the sweep line more than 10% of the sweep division reading, correct the sweep range calibration and note the correction

on the calibration data sheet. If recordable reflectors are noted on the data sheets, those data sheets shall be considered invalid. A new calibration shall be established and recorded, and the affected areas re-examined.

E. The use of simulators to verify 8.2.A is allowed if used in accordance with the following:

1) Simulator checks must be correlated with the original calibration block during the original calibration.

2) Simulator check shall be made with the entire system.

3) Simulator used shall be completely identifiable on the Calibration Data Sheet (Figure 1).

NOTE: A simulator may be any one or combination of the following:

4) A suitable reflector from an IIW Block

5) A suitable reflector from a Mini IIW Block

8.3 SCANNING – GENERAL REQUIREMENTS

A. Calibrate the system as described in Section 7 as appropriate.

B. Locate the exam area on the component.

C. Verify that the surface finish on the component is similar to that of the calibration block used to calibrate the system.

D. Establish a search unit scan path that provides 100% code required volume coverage (or maximizes coverage if 100% coverage is not achievable).

E. Each scan shall be overlapped a minimum of 50% of the element dimension.

F. The rate of search unit movement shall not exceed 6 inches per second.

G. Record all indications as required by Section 9.0. If examination volume is free of recordable indications, this shall be noted on the data sheet.

H. Record all obstructions or other conditions that interfered with the examination.

I. Remove couplant from examination surface.

8.4 SCANNING REQUIREMENTS

A. Examination Scan Layout.

1) Determine the proper tangential (skew) angle for the nozzle to be examined. See Figure 4 for the skew angle calculations.

2) Using a suitable marker, divide and mark the shell 360° around each nozzle, in equal divisions with as many lines as are necessary to aid in maintaining the proper tangential (skew) approach to each nozzle inner radius.

3) There should be as many divisions as are necessary to visually aid the ultrasonic examiner to maintain the required overlap.

B. SCANNING PROCEDURES

1) With the transducer at the proper skew angle (CW or CCW), scan the inner radius area (360° around the nozzle following the layout lines and scan paths limits. The transducer shall be swiveled to ensure complete coverage and to monitor bore location.

2) During scanning of uncladded nozzles, the sensitivity level shall be increased 2X (6dB) greater than the calibration sensitivity level. This is the scanning sensitivity level for uncladded nozzles.

3) For the scanning of cladded nozzles, with the search unit positioned at the 0° reference point of the nozzle, the sensitivity control shall be adjusted to bring the cladding interface signal response level to 20% FSH. This is the scanning sensitivity level for cladded nozzles.

4) Record scanning sensitivity and the nozzle identification in the comments section of the Calibration Data Sheet. All indications shall be recorded and evaluated at the scanning sensitivity.

5) Transducer movement shall not proceed onto the OD radius blend of the nozzle. The radius blend does not permit proper angle entry of the sound.

6) Repeat the foregoing paragraphs for the opposite skew angle to complete the scanning requirements of two directions for each nozzle inner radius area.

7) All information including geometric restraints, shall be recorded on the appropriate data sheet(s).

9. RECORDING CRITERIA

NOTE: All signals to be recorded must have metal path movement. Metal path movement of a signal is when the indication "walks" across the screen in a continuous sweep. for nozzles with cladding, the signal must be above the "clad roll."

9.1 All indications showing a signal amplitude response ≥ 40% FSH (at the scan sensitivity) shall be recorded and plotted full scale on the appropriate examination data sheet at the time of examination.

9.2 In addition to the requirements of 9.1, the examiner shall record and plot all indications considered relevant for further evaluation. All recorded indications shall be evaluated by a Level III for disposition.

9.3 All indications shall be reported in inches and degrees CW or CCW from the datum point when looking toward the vessel and away from the nozzle barrel to the search unit exit point.

9.4 Refer to ASME Boiler and Pressure Vessel Code Section XI, IWA-3000 for evaluation criteria. 

10. EXAMINATION RECORDS

10.1 NES shall be responsible for submitting to the Plant Owner, or his Agent, a complete set of examination records.

10.2 Figure 1 shall be completed by examiner(s) at the time of calibration. figures 2 and 3 shall be completed by the examiner(s) as required.

10.3 The Examiner(s) shall sign the completed data sheet(s), noting applicable NDE Certification Level(s).

10.4 NES record retention shall be limited to that time until the Final Report and/or the examination data is delivered to the Plant Owner or his Agent.

11. ATTACHMENTS

11.1 FIGURE 1 – Ultrasonic Calibration Data Sheet

11.2 FIGURE 2 – Ultrasonic Weld Examination Sheet

11.3 FIGURE 3 – Ultrasonic Indication Report Sheet

11.4 FIGURE 4 – Skew Angle Calculation Sheet

11.5 FIGURE 5 – Examination of Nozzle Inner Radius Areas

11.6 FIGURE 6 – Metal Path Calibration for a 10.0 inch presentation

11.7 FIGURE 7 – Metal Path Calibration for a 20.0 inch presentation

DATA SHEET NO. _____

PAGE _____ OF _____

ULTRASONIC CALIBRATION DATA SHEET

PROC. NO. _____

REV. _____

CHANGE NO. _____

INSTRUMENT

Model _____

Serial No. _____

Sweep Length _____ Delay _____

Range _____

Gain (coarse) _____ dB

Gain (fine) _____ dB

Reference Sensitivity _____ dB

Remarks: _____

SEARCH UNIT

Serial No. _____

Size _____

Frequency _____ MHz

Mode _____

Nom. Angle _____ °

Measured Angle _____ °

Cable Type _____

Cable Length _____

Remarks: _____

CALIBRATION BLOCK

No. _____

"T" _____ Dia. _____

Temperature _____ ° F

Thermometer S/N _____

CALIBRATION

0° ☐ Axial ☐ Circ. ☐

Metal Path ☐ Depth ☐

Each Major Screen Div. = _____

Remarks _____

COUPLANT

Brand _____

Batch No. _____

VERTICAL LINEARITY

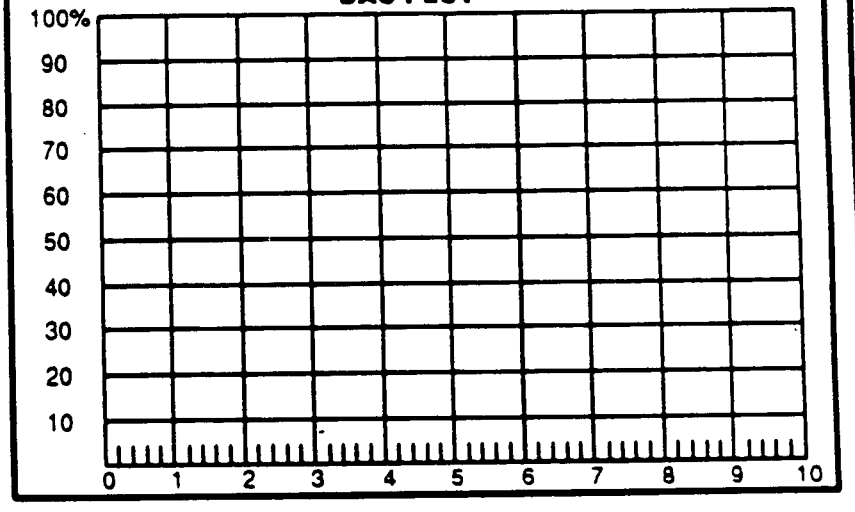
AMPLITUDE % FSH

	HIGH	LOW		HIGH	LOW
1			6		
2			7		
3			8		
4			9		
5			10		

AMPL. CONTROL LINEARITY

INITIAL	dB	RESULT
80	-6	
80	-12	
40	+6	
20	+12	

DAC PLOT



CAL. CHECKS	TIME
INITIAL CAL.	
INTERMEDIATE	
INTERMEDIATE	
INTERMEDIATE	
FINAL CAL.	

REMARKS: _____

EXAMINERS 1 _____ LEVEL _____ DATE _____

2 _____ LEVEL _____ DATE _____

REVIEWERS 1 _____ LEVEL _____ DATE _____

2 _____ LEVEL _____ DATE _____

3 _____ LEVEL _____ DATE _____

NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC CALIBRATION DATA SHEET
FIGURE 1

DATA SHEET NO. ____________
PAGE ______ OF ______
EXAM ITEM

ULTRASONIC EXAMINATION DATA SHEET

COMPONENT/SYSTEM ____________
ISO/DWG. NO. ______ REV. ______
THERMOMETER S/N ____________
COMPONENT TEMP. ______ ° F

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

REMARKS:

SCAN ____ ° SCAN dB ____				EXAMINATION COMPLETE		GEOMETRIC INDICATIONS		RECORDABLE INDICATIONS		EVALUATION	
0°	⊥	=		YES	NO	YES	NO	YES	NO	ACC.	REJ.

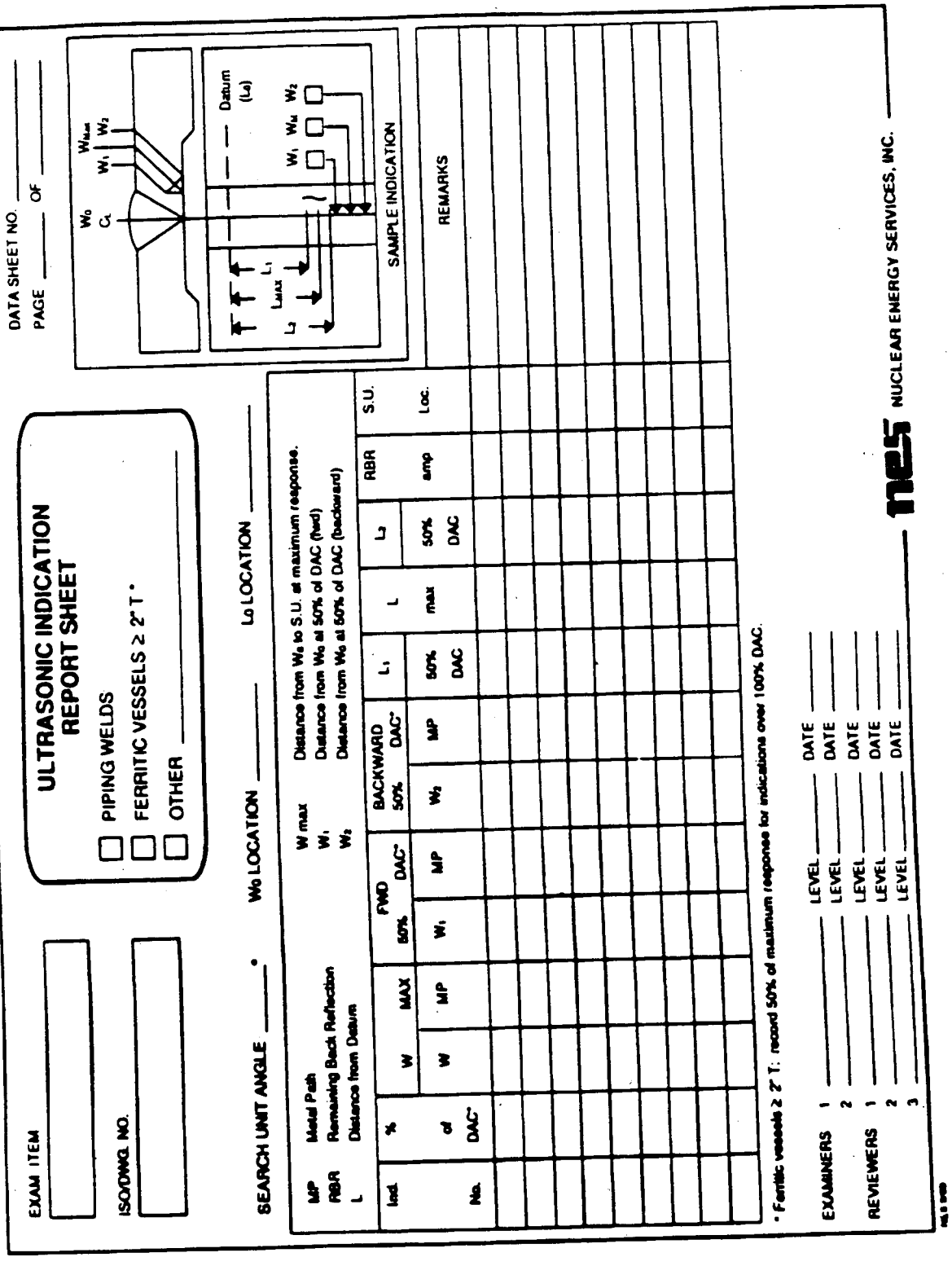
REMARKS:

EXAMINERS:
1 ____________ LEVEL ______ DATE ______
2 ____________ LEVEL ______ DATE ______

REVIEWERS:
1 ____________ LEVEL ______ DATE ______
2 ____________ LEVEL ______ DATE ______
3 ____________ LEVEL ______ DATE ______

nes NUCLEAR ENERGY SERVICES, INC.

ULTRASONIC EXAMINATION SHEET
FIGURE 2



ULTRASONIC INDICATION REPORT SHEET
FIGURE 3

Formula 1

Angle A = 135°

Angle B = Skew Angle

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{5}{\sin 135} = \frac{1.719}{\sin B} \quad \sin B = \frac{\sin 135° \cdot 1.719}{5}$$

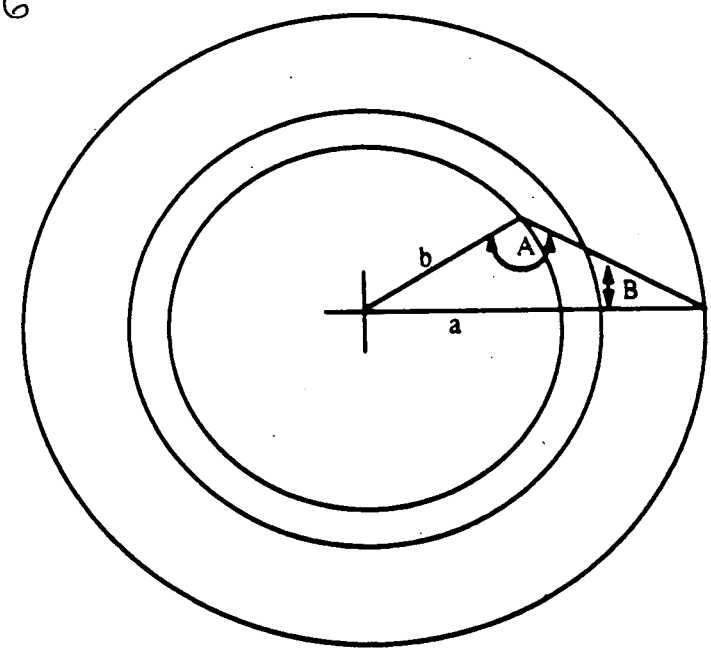
14.06°

Formula 2

Dimension a = outside radius 32"Circ 10"Dia 5"R

Dimension b = inside radius of nozzle ~~4"Dia 2"R~~ 3.438 1.719R

$$B = \sin^{-1}(b/a\sqrt{2})$$



Example Formula 2

Determine skew angle (angle B)

dimension a = 20"

dimension b = 10"

$B = \sin^{-1}(10/20\sqrt{2})$

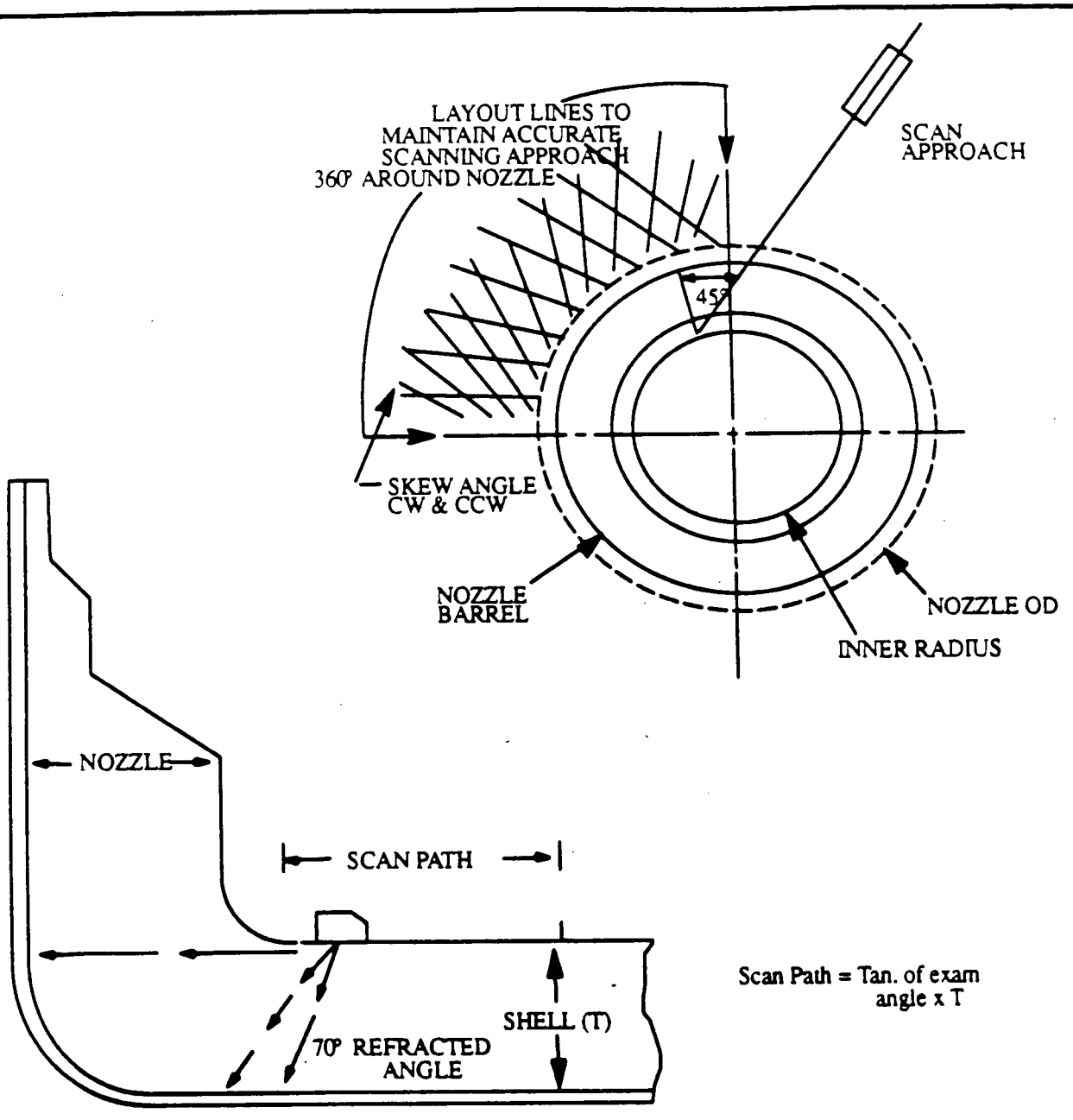
$B = \sin^{-1}(0.3536)$

B = 20.70°

Skew Angle – 20.70°

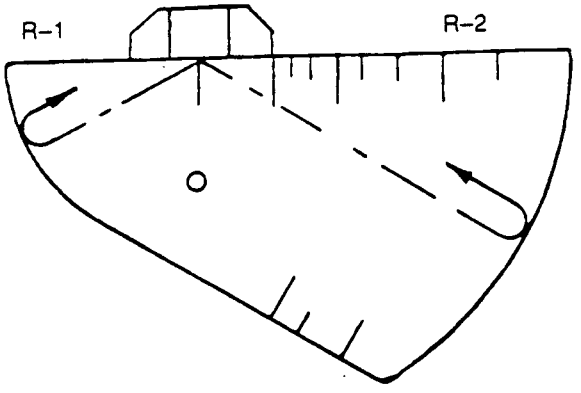
SKEW ANGLE CALCULATION SHEET

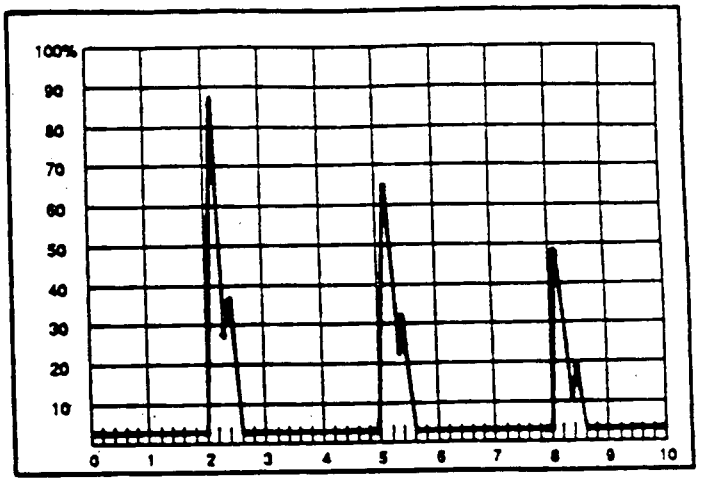
FIGURE 4



EXAMINATION OF NOZZLE INNER RADIUS AREAS

FIGURE 5





METAL PATH CALIBRATION FOR A 10" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

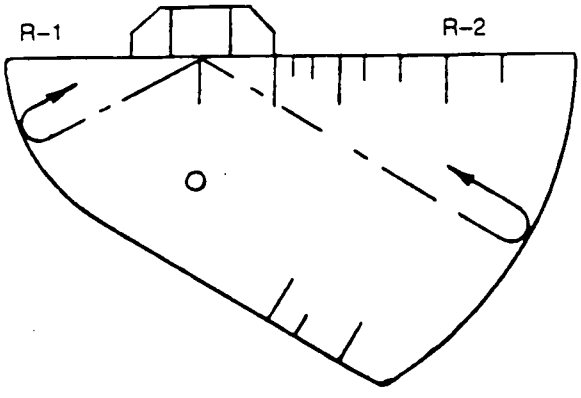
1) With the transducer facing the 2" radius, maximize the signal from the 2" radius (R–2) and align this signal at CRT position 2.

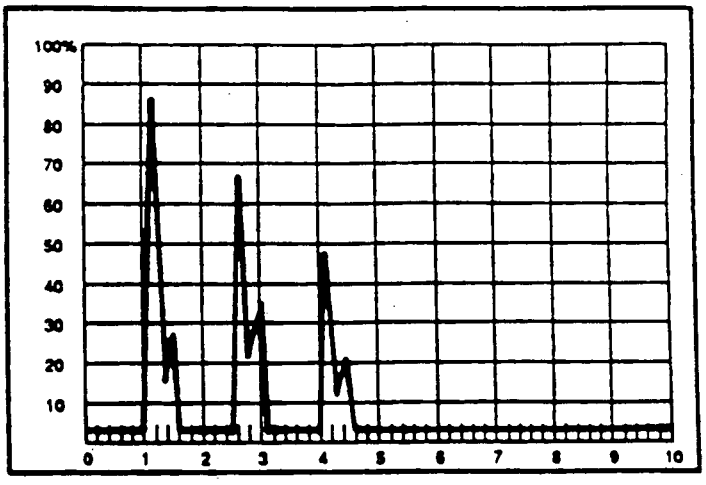
2) Adjust the gain control if necessary and observe the signals that appear from the 5" and 8" metal paths. (These metal pats and signals result from the sound making successive "round trips" from each radius).

3) With the Sweep and Delay controls, align these signals at CRT positions 5 and 8 respectively.

The instrument is now calibrated for 10.0" metal path. Each Major Division = 1.0".

FIGURE 6





19.61

METAL PATH CALIBRATION FOR A 20" CRT PRESENTATION

With the search unit coupled to the Miniature IIW Block and:

4) With the transducer facing the 2" radius, maximize the signal from the 2" radius (R–2) at CRT position 1.

5) Adjust the gain control if necessary and observe the signals that appear from the 5" and 8" metal paths. (These metal pats and signals result from the sound making successive "round trips" from each radius).

6) With the Sweep and Delay controls, align these signals at CRT positions 2.5 and 4 respectively.

The instrument is now calibrated for 20.0" metal path. Each Major Division = 2.0".

FIGURE 7

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1216

CALIBRATION OF THERMOMETERS

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/17/93

Expiration Date 2/16/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 15JUL93
Manager - Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 10	0

CALIBRATION OF THERMOMETERS (5)

CONTROLLED COPY

ct Application	Copy No	Assigned To

APPROVALS

TITLE / DEPT. - SIGNATURE - DATE

REV NO	PREPARED BY	Executive Vice President	QA Manager		
0					
1					
2					
3					
4					
5	[illegible]	[illegible] 3/5/90	[illegible]		
6					
7					
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10					
11					

REVISION LOG

REV. NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL
1	4/13/83	4,5	Add to para. 3.5 "A nonconformance report (as identified in Section 15 of the NES Division Inservice Inspection Quality Assurance Manual, Document 80A9021) shall be prepared for temperature indicators which fail the calibration check requirements.", CRA 3247	T. V. Truscott
2	5/5/83	4,5	Para. 3.5, delete "(as identified... Document 80A9021)", CRA 3330	T. V. Truscott
3	2/8/85	1	New Cover Sheet	TJKoch
		4	Traceability to National Standards	
		4,7	Indicator calibration check tolerance	
		5	Certification requirements for purchased indicators	
			CRA 5037	
4	7/10/86	7	Figure 1; Added "Full scale reading of indicator being checked." See CRA 6179.	MEalling
5	1/25/90	All	Major rewrite - SEE CRA 7516	[illegible]

5

CALIBRATION OF THERMOMETERS

1. OBJECTIVE

The objective of this procedure is to define the method for checking the calibration of thermometers to assure their accuracy.

2. GENERAL

2.1 SCOPE

This procedure applies to surface thermometers used in verifying the temperature of components in conjunction with a nondestructive examination. It defines the method for verifying the calibration of thermometers, the frequency and required documentation.

2.2 REFERENCES

This procedure is intended to be used as a Quality Control Procedure in compliance with a referencing Quality Assurance Manual.

3. RESPONSIBILITIES

It is the responsibility of the NES Site Supervisor to ensure that all thermometers in use on site have valid calibration stickers attached.

It is the responsibility of the Home Office equipment technician to ensure that all thermometers sent to site for use have valid calibration stickers attached.

4. CALIBRATION REQUIREMENTS

4.1 COMPONENTS

Individual thermometers are checked for accuracy as defined in this section. Each thermometer is numbered to provide traceability to the calibration check records (Exhibit A).

4.2 FREQUENCY

4.2.1 Field Thermometers

Thermometers in use are checked against a control thermometer at least once every three (3) months.

4.2.2 Control Thermometers

NES Control Thermometers are checked annually against each other.

4.3 CONTROL THERMOMETERS

Two glass thermometers are retained as Control Thermometers. These thermometers are kept in a protective container which is clearly marked as "Control Thermometer".

The Control Thermometers are traceable to National Standards.

4.4 CALIBRATION CHECK REQUIREMENTS

4.4.1 Calibration Range

All thermometer checks required by this procedure are conducted at two (2) temperature readings which are separated by at least 50°F. The two temperatures used shall be within the normal NDE ranges (usually 40°F to 200°F).

4.4.2 Check of Control Thermometers

The two control thermometers are checked against each other. This check is documented on a copy of the Temperature Indicator Control Record (Exhibit A). To be acceptable, the temperature readings must be within 2% of each other.

NOTE: ▸ Control Thermometers shall be checked for column separation at each use. A thermometer that shows signs of column separation is replaced. 5

4.4.3 Check of Field Thermometers

Field thermometers are checked against either of the controlled thermometers. To be acceptable, the temperature readings of the field thermometer must be within 5% of the control thermometer or 5°F, which ever is greater. The check is documented on the Thermometer Check Record (Exhibit A).

4.4.4 Nonconformances

Thermometers which do not meet the requirements of 4.4.2 or 4.4.3 are tagged as nonconforming and segregated from the acceptable units. A nonconformance report is then prepared and processed per NES Procedure 80A9082, Company Nonconformance Control.

5. DOCUMENTATION

5.1 CERTIFICATE FOR THE CONTROL THERMOMETERS

5.1.1 When the thermometers to be used as the control thermometers are purchased, a certificate containing the following information is obtained:

A. Name of the agency performing the check

B. Identification of the control thermometer

C. Date of check

D. Identification of the reference temperature indicator

E. Traceability to National Standards for the reference

F. Temperatures verified and deviation

G. Signature attesting to certificate validity.

5.2 VOID DATES

5.2.1 Control Thermometers

A sticker is affixed to the container for a control thermometer indicating: Thermometer identification, the date of calibration, verifiers initials and a recalibration due date 12 months later.

5.2.2 Field Thermometers

A sticker is affixed to a field thermometer which indicates thermometer identification, calibration date, calibrators initials and a recalibration due date 3 months later.

5.3 THERMOMETER CHECK RECORDS

When thermometers are checked in accordance with 4.4, a form (Exhibit A) is completed by the person performing the check.

A

(EXHIBIT A)
THERMOMETER CHECK RECORD

USE FOR CONTROL THERMOMETER(S)
CONTROL THERMOMETER DATA

SERIAL NUMBER	LOW°	HIGH°	ACCEPTANCE CRITERIA	ACCEPT	REJECT
1.			Differential of 2% between #1 and #2 high & low readings		
2.					

USE FOR FIELD THERMOMETERS

Check Readings
at $\geq 50^{\circ}\Delta$

	CHECK DATE	VOID DATE	LOW°	HIGH°	SERIAL NO.	ACCEPT/ REJECT
CONTROL						
FIELD						

INSTRUCTIONS:

1) Place Control Thermometer in a can of water.
2) Place Field Thermometer(s) on side of the can.
3) Wait a minimum of ten minutes, then record low readings.
4) Warm the water in the can at least 50° higher than the temperature of the reading in (3).
5) Wait a minimum of ten minutes, then record high readings.

NOTE: ENSURE THAT THE WATER TEMPERATURE DOES NOT DROP BELOW THE DIFFERENTIAL MINIMUM OF 50°F.

6) The temperature readings of the Field Thermometers must be within 5% of the Control Thermometers or 5°F, whichever is greater.
7) Retain a copy of this form for your records, mail a copy to the equipment technician for filing at the Home Office.

TEST CONDUCTED BY: _____ _____
SIGNATURE DATE

6.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

SPECIAL PROCEDURE

SP-1215

ULTRASONIC THICKNESS MEASUREMENT

FOR H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2

REVISION 0

Effective Date 8/17/93

Expiration Date 2/16/94

RECOMMENDED BY: _____ 7/15/93
Engineering Manager - Programs — Date

APPROVED BY: _____ 15 JUL 93
Manager - Technical Support — Date

CONTROLLED
RECIPIENT
ID 296

LIST OF EFFECTIVE PAGES

EFFECTIVE PAGES	REVISION
Cover Sheet	0
LEP	0
3 through 12	0

ULTRASONIC THICKNESS MEASUREMENT

FOR

H.B. ROBINSON STEAM ELECTRIC PLANT

UNIT 2

CONTROLLED COPY

ect Application	Copy No.	Assigned To
2454		

APPROVALS

TITLE / DEPT. – SIGNATURE – DATE

REV NO	PREPARED BY	LEVEL III	PROJECT MGR.	GENERAL MGR.	
0	Scott Larson	2/20/92	2.20.92	2.20.92	
1					
2					
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4					
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REVISION LOG

NUCLEAR ENERGY SERVICES, INC.

DOCUMENT NO.______________

PAGE 2 OF 9

REV NO.	DATE	PAGE NO.	DESCRIPTION	APPROVAL

FORM # NES 206 3/90

1. PURPOSE

The purpose of this procedure is to define the techniques and equipment as used to make ultrasonic thickness measurements.

2. SCOPE

This procedure is limited to manual; digital and analog ultrasonic thickness measurement of ferritic and non–ferritic materials up to and including 6" in thickness. The measurements are made from the accessible surface of the component.

3. REFERENCES

3.1 Document 80A9068. NES Procedure for Certifying Nondestructive Examination Personnel.

4. PERSONNEL REQUIREMENTS

4.1 Personnel performing thickness measurements to this procedure shall be certified in accordance with reference 3.1

4.2 At least one member of each crew shall have a minimum certification of Level II (Thickness)

4.3 A copy of each examiner's certification summary and current eye test shall be maintained on site.

4.4 A copy of each examiner's certification summary and current eye test shall be made available to the plant owner or his agent prior to performing examinations per this procedure.

5. EQUIPMENT AND MATERIAL REQUIREMENTS

5.1 INSTRUMENTATION

Ultrasonic pulse echo instrumentation that operates within a frequency range of 1.0 MHz to 5.0 Mhz. The instrumentation may include analog and/or digital display(s). (Analog = instrumentation using a Cathode Ray Tube (CRT) display).

5.2 SEARCH UNITS

Search units may contain either single or dual transducer elements. Search units with delay lines (stand off) may be used providing that satisfactory calibration can be achieved.

5.3 CABLES

Cables, where not integrally attached to the search unit, may be any convenient length. Examinations shall be conducted using the same cable as that used during the calibration.

5.4 COUPLANT

Ultragel – or couplant supplied by the plant owner

5.5 CALIBRATION SAMPLES

Calibration shall be performed using samples selected and provided by the plant owner. Where these do not exist, samples fabricated from similar material to the component being measured shall be used.

CAUTION:

Stainless steels are prone to sound velocity changes. This should be considered when selecting calibration samples.

---

6. GENERAL PREREQUISITES

6.1 The components to be examined shall be identified / determined by the plant owner.

6.2 The component shall be prepared for examination by the plant owner, e.g. the examination surface shall be free of foreign matter which may interfere with ultrasonic transmission.

6.3 The examiner shall notify the NES lead individual or other designated contact individual when component surface conditions are not suitable for the ultrasonic thickness measurement.

7. CALIBRATION PROCEDURE

7.1 PREREQUISITES

NOTE: At least two samples of known thickness should be available for all thickness measurement calibration. One reference thickness should be of greater thickness and the other, of lesser thickness than the nominal thickness of the component to be measured. Step wedges of appropriate material and thickness range are acceptable for calibration.

A. Calibration shall be performed using the same search units and cables that are to be used for thickness measurement.

B. The temperature of the calibration samples shall be within 25°F of the component being measured.

C. Ensure that the instrument cable and search unit (system) are functioning correctly.

7.2 CALIBRATION

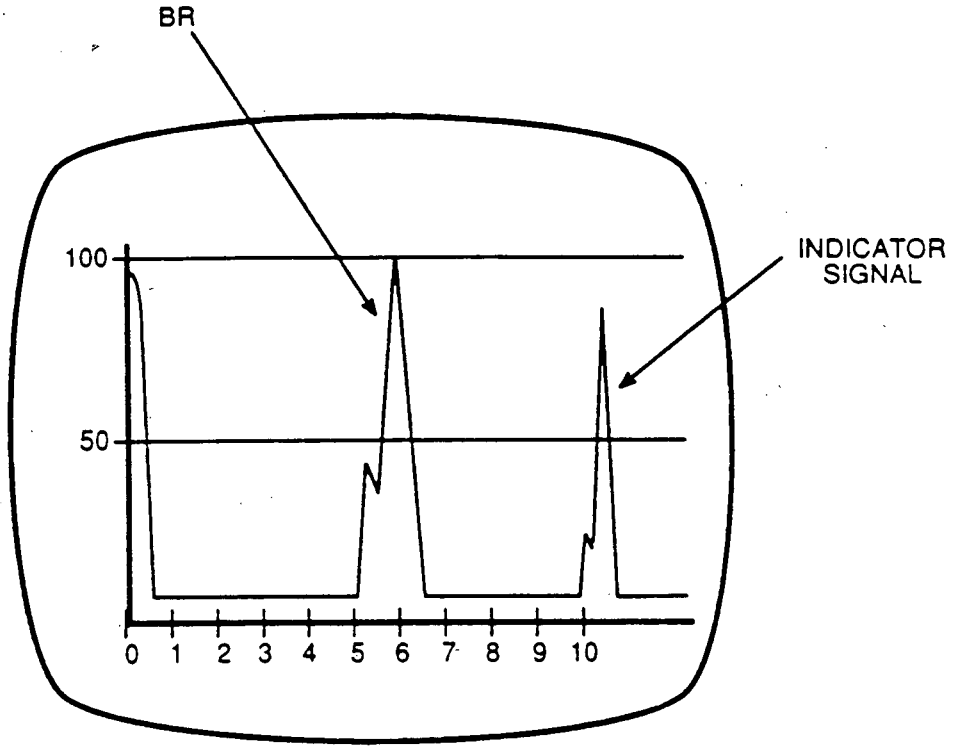
7.2.1 Analog Instruments

7.2.2 Analog instruments shall be calibrated in accordance with the following instructions. If other methods of calibration are required, they shall be approved by an NES UT L III

7.2.2.1 Single Element Search Unit

a. Set the search unit on the thicker calibration sample and produce a back reflection (BR) at 100% (nominal) full screen height (FSH) and include at least one repeat BR

b. Using the SWEEP and DELAY controls, align these signals with positions on the screen that correspond to the thickness of the sample and a multiple of this thickness. (e.g. for a 1" sample, the BR is aligned with position 5, and the repeat BR is aligned with position 10. See following figure).



c. The repeat BR that is aligned with the actual thickness position is the INDICATOR SIGNAL. (In the example above, the signal at position 10 is the INDICATOR SIGNAL. If readings are taken from the indicator signal, then full screen represents 1.0" and each major screen division equals 0.1").

d. Check the accuracy – with the DELAY control only, move the signals to the left until the next set of signals appear. (Additional gain may be required). These signals should now appear at exactly the same positions as the first set of signals did prior to being delayed. If not, adjust the SWEEP and DELAY controls until there is alignment.

e. Return the timebase to its original position using the DELAY control.

f. The search unit is now placed on a sample of thinner dimension and the thickness is measured.

g. Lock the controls. The system is now calibrated for measuring thickness of a specific material.

NOTE: It should not be necessary to adjust the controls at this point. If the measurement is inaccurate, check sample thicknesses with a Micrometer and make sure that the sample materials are similar to each other as well as to the component that you are about to measure.

7.2.2.2 Dual Element Search Unit

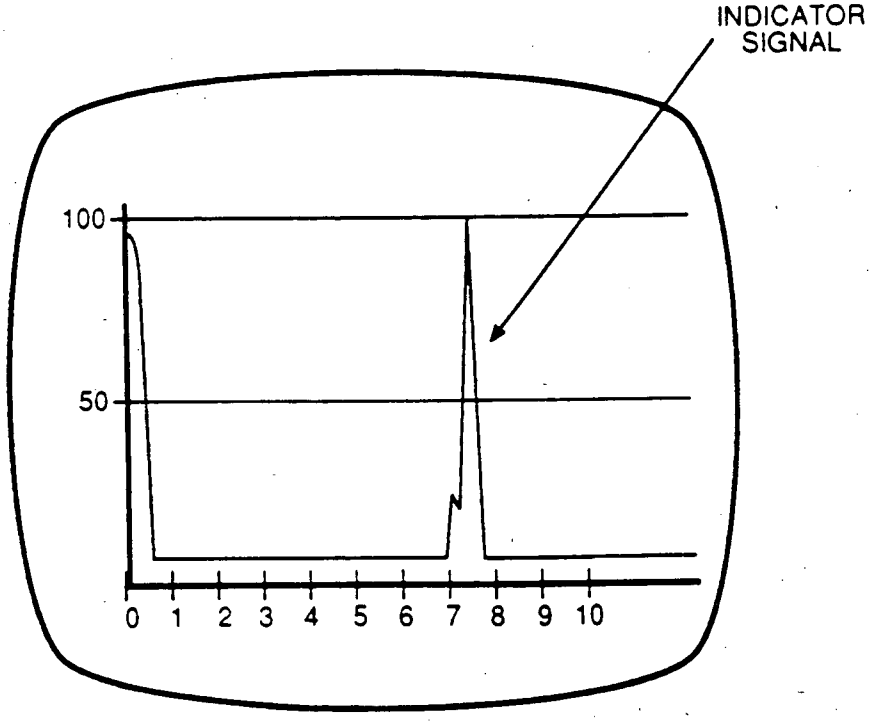
a. Set the search unit on the calibration sample and produce a BR at 100% (nominal) FSH from a thickness that is greater than the nominal thickness of the component that is to be measured.

b. Align this signal with the position on the graticule that corresponds to the thickness of the sample. This is the indicator signal.

c. Place the search unit on a sample thickness that is less than the nominal thickness of the component to be measured and align this signal with the position on the graticule that corresponds to this sample thickness.

d. Using the SWEEP and DELAY controls while moving from the sample in (a) above to the sample in (c) above, align the signals with their corresponding thicknesses until a LINEAR TIMEBASE is achieved.

See sketch below.



7.2.3 Digital Instruments

Digital instruments shall be calibrated in accordance with the manufacturers instructions. Some digital instruments use two controls for calibration. These generally function in a similar manner to the SWEEP and DELAY controls that exist on a conventional ultrasonic flaw detector. In this case, calibrate the instrument by balancing the two controls until the desired thickness readings are obtained between two or more thicknesses.

NOTE: Manufacturer's instructions where necessary, are attached to this procedure.

7.3 CALIBRATION CHECKS

A. Calibration checks shall be conducted at the start and finish of measurements for which the calibration applies.

B. These checks shall also be conducted as a minimum every two hours, however, it is recommended that where possible, checks be performed more frequently.

C. Checks shall be made if any malfunction is suspected.

NOTE: In the event of a check revealing inaccuracies greater 2%, the instrument shall be recalibrated and all measurements made since the previous check or calibration, shall be remeasured.

---

8. EXAMINATION PROCEDURE

8.1 PREREQUISITES

8.1.1 System Calibration

a. Perform the calibration as close as possible in time prior to performing the measurements, and at any time that any part of the system is changed. (Search unit, cable or batteries)

b. Calibration shall be performed with every change of personnel.

8.1.2 Gridding

a. Gridding shall be accomplished as directed by the plant owner.

b. Datum should be referenced from a permanent mark or appendage where possible.

8.2 MEASUREMENTS

NOTE: Measurements shall be made at positions determined by the plant owner. Where minimum wall thickness requirements are provided and if this condition is encountered, adjacent areas shall be scanned in order to locate the lowest reading.

---

a. Place the couplant and search unit at the appropriate measurement site.

b. Allow the signal or reading to stabilize.

c. In the case of analog readings, note the appropriate position of the INDICATOR SIGNAL.

d. In the case of direct digital readout equipment, note the thickness on the display

9. RECORDING

A. Thickness readings shall be recorded either on a grid drawing or entered into an electronic data bank. Alternately, thickness measurements and corresponding calibration/equipment data may be recorded on forms provided by the plant owner.

B. When using equipment with electronic data banks, refer to the instructions included with the equipment.

10. POST EXAMINATION CLEANUP

After obtaining all the necessary information, all couplant shall be removed from the component leaving the surface dry.

9.0 This special procedure will be sent to the Vault in the Refueling Outage 15 90-day Inservice Inspection Report.

NES, INC

H. B. ROBINSON 1993 OUTAGE

ULTRASONIC INSTRUMENT INVENTORY LIST

MODEL	SERIAL NO.
KBI/USL-48	213220-4
KBI/USK-7	27276-3702
KBI/USK-7	27276-3784
KBI/USK-7	27276-4172
KBI/USK-7	27276-749
KBI/USK-7	27276-784
KBI/USK-7	27276-807
KBI/USK-7S	31459-1499

Ultrasonic Instrument Linearity Record

PRE OUTAGE [✓] POST OUTAGE [ ] OTHER [ ]

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USL-48 SERIAL NO. 213220-4

TRANSDUCER

0°		ANGLE BEAM	
SERIAL NO.	J10523	SERIAL NO.	N/A
FREQ.	2.25 MHz	FREQ.	N/A MHz
SIZE	.50"	SIZE	N/A

CAL. STANDARD IIW TYPE 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	26
7	40	20	(25) – (15)	21
8	30	15	(20) – (10)	16
9	20	10	(15) – (05)	11

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42%	32% – 48%
80% FSH	Down 12	24%	16% – 24%
40% FSH	Up 6	77%	64% – 96%
20% FSH	Up 12	68%	64% – 96%

Gain Control Full Range Checked: [✓] Acceptable [ ] Not Acceptable

This Instrument is Considered: [✓] Acceptable [ ] Not Acceptable

Examiner David M Martin Level II Date 9-3-93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE KRAUT KRAMER BRANSON MODEL USL 48 SERIAL NO. 213220.4

TRANSDUCER

0°

SERIAL NO. M12411
FREQ. 5 MHz
SIZE .5"

ANGLE BEAM

SERIAL NO.
FREQ. N/A MHz
SIZE

CAL. STANDARD IIW TYPE 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	41	32% – 48%
80% FSH	Down 12	22	16% – 24%
40% FSH	Up 6	78	64% – 96%
20% FSH	Up 12	78	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner Steve Wollum Level I Date 10-13-93

Reviewed by Scott Sam Level III Date 10-13-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☑ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USK-7 SERIAL NO. 27276-3702

TRANSDUCER

0°

SERIAL NO. M16502
FREQ. 2.25 MHz
SIZE .25"

ANGLE BEAM

SERIAL NO.
FREQ. N/A MHz
SIZE

CAL. STANDARD IIW TYPE 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	19
8	30	15	(20) – (10)	14
9	20	10	(15) – (05)	08

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42%	32% – 48%
80% FSH	Down 12	21%	16% – 24%
40% FSH	Up 6	77%	64% – 96%
20% FSH	Up 12	77%	64% – 96%

Gain Control Full Range Checked: ☑ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☑ Acceptable ☐ Not Acceptable

Examiner David M Marston Level II Date 9.3.93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE Krautkramer MODEL USK-7 SERIAL NO. 27276-3702

TRANSDUCER

0°

SERIAL NO. J10523
FREQ. 2.25 MHz
SIZE .5"

ANGLE BEAM

SERIAL NO. N/A
FREQ. N/A MHz
SIZE N/A

CAL. STANDARD Step Wedge 80C3613 E SERIAL NO. N/A

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	41	32% – 48%
80% FSH	Down 12	21	16% – 24%
40% FSH	Up 6	78	64% – 96%
20% FSH	Up 12	78	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner [signature] Level III Date 10/15/93

Reviewed by [signature] Level III Date 10-15-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☑ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USK-7 SERIAL NO. 27276-3784

TRANSDUCER

0°		ANGLE BEAM	
SERIAL NO.	M16502	SERIAL NO.	N/A
FREQ.	2.25 MHz	FREQ.	N/A MHz
SIZE	.25"	SIZE	N/A

CAL. STANDARD IIW TYPE 2 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42%	32% – 48%
80% FSH	Down 12	22%	16% – 24%
40% FSH	Up 6	76%	64% – 96%
20% FSH	Up 12	71%	64% – 96%

Gain Control Full Range Checked: ☑ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☑ Acceptable ☐ Not Acceptable

Examiner David M Mountain Level II Date 9-3-93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE Krautkramer MODEL USK-7 SERIAL NO. 27276-3784

TRANSDUCER

0°		ANGLE BEAM	
SERIAL NO.	J10523	SERIAL NO.	N/A
FREQ.	2.25 MHz	FREQ.	N/A MHz
SIZE	.5"	SIZE	N/A

CAL. STANDARD StepWedge 80C3613 E SERIAL NO. N/A

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42	32% – 48%
80% FSH	Down 12	22	16% – 24%
40% FSH	Up 6	76	64% – 96%
20% FSH	Up 12	75	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner _____ Level III Date 10/15/93

Reviewed by _____ Level III Date 10-15-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☑ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USK-7 SERIAL NO. 27276-4172

TRANSDUCER

0°

SERIAL NO. M16502
FREQ. 2.25 MHz
SIZE .25"

ANGLE BEAM

SERIAL NO. N/A
FREQ. N/A MHz
SIZE N/A

CAL. STANDARD IIW TYPE 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	19
8	30	15	(20) – (10)	14
9	20	10	(15) – (05)	08

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	40 %	32% – 48%
80% FSH	Down 12	20 %	16% – 24%
40% FSH	Up 6	78 %	64% – 96%
20% FSH	Up 12	83 %	64% – 96%

Gain Control Full Range Checked: ☑ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☑ Acceptable ☐ Not Acceptable

Examiner David M Martin Level II Date 9.3.93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE [N/A] POST OUTAGE [X] OTHER [N/A]

UT INSTRUMENT

MAKE Krautkramer-Branson MODEL USK-7 SERIAL NO. 27276-4172

TRANSDUCER

0°

SERIAL NO. M16502
FREQ. 2.25 MHz
SIZE .25"

ANGLE BEAM

SERIAL NO. N/A
FREQ. N/A MHz
SIZE N/A

CAL. STANDARD IIW Type 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	52
2	90	45	(50) – (40)	46
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	40	32% – 48%
80% FSH	Down 12	20	16% – 24%
40% FSH	Up 6	80	64% – 96%
20% FSH	Up 12	80	64% – 96%

Gain Control Full Range Checked: [X] Acceptable [ ] Not Acceptable

This Instrument is Considered: [X] Acceptable [ ] Not Acceptable

Examiner Tim Oddsen Level II Date 10-13-93

Reviewed by Scott Lam Level III Date 10-13-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☑ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USN-7 SERIAL NO. 27276-749

TRANSDUCER

0°		ANGLE BEAM	
SERIAL NO.	M16502	SERIAL NO.	N/A
FREQ.	2.25 MHz	FREQ.	N/A MHz
SIZE	.25"	SIZE	N/A

CAL. STANDARD IIW TYPE 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	46
3	80	40	(45) – (35)	42
4	70	35	(40) – (30)	37
5	60	30	(35) – (25)	32
6	50	25	(30) – (20)	26
7	40	20	(25) – (15)	21
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42%	32% – 48%
80% FSH	Down 12	22%	16% – 24%
40% FSH	Up 6	77%	64% – 96%
20% FSH	Up 12	75%	64% – 96%

Gain Control Full Range Checked: ☑ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☑ Acceptable ☐ Not Acceptable

Examiner David M Martin Level II Date 9-3-93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE KrautKramer-Branson MODEL USK-7 SERIAL NO. 27276-749

TRANSDUCER

0°

SERIAL NO. M16502

FREQ. 2.25 MHz

SIZE .25

ANGLE BEAM

SERIAL NO. N/A

FREQ. MHz

SIZE

CAL. STANDARD IIW Type 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	52
2	90	45	(50) – (40)	46
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	36
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42	32% – 48%
80% FSH	Down 12	20	16% – 24%
40% FSH	Up 6	78	64% – 96%
20% FSH	Up 12	78	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner Tim Addison Level II Date 10-12-93

Reviewed by Scott Lucas Level III Date 10-12-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☑ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USK-7 SERIAL NO. 27276-784

TRANSDUCER

0°

SERIAL NO. M16502
FREQ. 2.25 MHz
SIZE .25"

ANGLE BEAM

SERIAL NO. N/A
FREQ. N/A MHz
SIZE N/A

CAL. STANDARD IIW TYPE 2 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42%	32% – 48%
80% FSH	Down 12	22%	16% – 24%
40% FSH	Up 6	77%	64% – 96%
20% FSH	Up 12	75%	64% – 96%

Gain Control Full Range Checked: ☑ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☑ Acceptable ☐ Not Acceptable

Examiner David G Martin Level II Date 9-3-93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE Krautkramer-Branson MODEL USK-7 SERIAL NO. 27276-784

TRANSDUCER

0°

SERIAL NO. M16502
FREQ. 2.25 MHz
SIZE .25"

ANGLE BEAM

SERIAL NO. N/A
FREQ. MHz
SIZE

CAL. STANDARD IIW Type 1 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42	32% – 48%
80% FSH	Down 12	22	16% – 24%
40% FSH	Up 6	78	64% – 96%
20% FSH	Up 12	76	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner Tim Oddsen Level II Date 10-12-93

Reviewed by Scott [illegible] Level III Date 10-12-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☑ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER-BRANSON MODEL USK-7 SERIAL NO. 27276-807

TRANSDUCER

0°

SERIAL NO. M16502
FREQ. 2.25 MHz
SIZE .25"

ANGLE BEAM

SERIAL NO. N/A
FREQ. N/A MHz
SIZE N/A

CAL. STANDARD IIW TYPE 2 SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	41%	32% – 48%
80% FSH	Down 12	21%	16% – 24%
40% FSH	Up 6	78%	64% – 96%
20% FSH	Up 12	78%	64% – 96%

Gain Control Full Range Checked: ☑ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☑ Acceptable ☐ Not Acceptable

Examiner David M Montero Level II Date 9.3.93

Reviewed by [signature] Level III Date 9/7/93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE KrautKramer MODEL USK-7 SERIAL NO. 27276-807

TRANSDUCER

0°

SERIAL NO. J10523
FREQ. 2.25 MHz
SIZE .5"

ANGLE BEAM

SERIAL NO. N/A
FREQ. N/A MHz
SIZE N/A

CAL. STANDARD BOC 3613 E Step Wedge SERIAL NO. N/A

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42	32% – 48%
80% FSH	Down 12	22	16% – 24%
40% FSH	Up 6	76	64% – 96%
20% FSH	Up 12	72	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner [signature] Level III Date 10/15/93

Reviewed by [signature] Level III Date 10-15-93

NES

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☒ POST OUTAGE ☐ OTHER ☐

UT INSTRUMENT

MAKE KRAUTKRAMER BRANSON MODEL USK 7S SERIAL NO. 31459-1499

TRANSDUCER

0°		ANGLE BEAM	
SERIAL NO.	J10523	SERIAL NO.	M14135
FREQ.	2.25 MHz	FREQ.	2.25 MHz
SIZE	.5"	SIZE	.5"

CAL. STANDARD IIW SERIAL NO. 1035-83

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	(Calculate) Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42	32% – 48%
80% FSH	Down 12	22	16% – 24%
40% FSH	Up 6	75	64% – 96%
20% FSH	Up 12	75	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner Steve Wollum Level I Date 10-4-93

Reviewed by Scott Lam Level III Date 10-4-93

nes

Ultrasonic Instrument Linearity Record

PRE OUTAGE ☐ POST OUTAGE ☒ OTHER ☐

UT INSTRUMENT

MAKE Krautk MODEL USK-5 SERIAL NO. 31469-1499 5 SE 10-11-93

TRANSDUCER

0°		ANGLE BEAM	
SERIAL NO.	M16502	SERIAL NO.	
FREQ.	2.25 MHz	FREQ.	MHz
SIZE	.25"	SIZE	A

CAL. STANDARD Rompas SERIAL NO. 86 3253

HORIZONTAL LINEARITY

Back Reflect.	Grid Loc.	Actual Loc.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10

SCREEN HEIGHT LINEARITY
SIGNAL AMPLITUDE IN % FSH

No.	Actual Higher Signal	(Calculate) 1/2 of Higher	Acceptable Limits*	Actual Lower Signal
1	100	50	(55) – (45)	50
2	90	45	(50) – (40)	45
3	80	40	(45) – (35)	40
4	70	35	(40) – (30)	35
5	60	30	(35) – (25)	30
6	50	25	(30) – (20)	25
7	40	20	(25) – (15)	20
8	30	15	(20) – (10)	15
9	20	10	(15) – (05)	10

* Acceptance limits are 1/2 of the Higher Signal + or – 5% FSH

AMPLITUDE CONTROL LINEARITY

Initial Amplitude	Db Change	Results	Limit
80% FSH	Down 6	42	32% – 48%
80% FSH	Down 12	21	16% – 24%
40% FSH	Up 6	76	64% – 96%
20% FSH	Up 12	74	64% – 96%

Gain Control Full Range Checked: ☒ Acceptable ☐ Not Acceptable

This Instrument is Considered: ☒ Acceptable ☐ Not Acceptable

Examiner Scott Lam Level III Date 10-11-93

Reviewed by _____ Level _____ Date _____

nes

TRANSDUCERS USED DURING RFO 15

15233
2211 93001
56760
56761
A24932
B02122
B05236
B07680
B25120
C09104
D10651
E18404
E20000
E24700
F11506
G09014
G10188
H26323
H28181
J09185
J10523
K03904
K05973
K08505
K18909
KB11403
L04260
L04261
L29324
M12411
M14135
M15116
M20226
W11025

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

Report No. 9541291

SEARCH UNIT DATA

Manufacturer Aerotech

Serial No. 15233

Mfgr. Designation MSWS-QC

Nominal Angle N/A ° (Check One)

✓ Long. ___ Shear

Nominal Frequency 1.5 MHz

Element Dimensions .375 Dia.

Tuning: (Check One)

✓ Tuned ___ Untuned

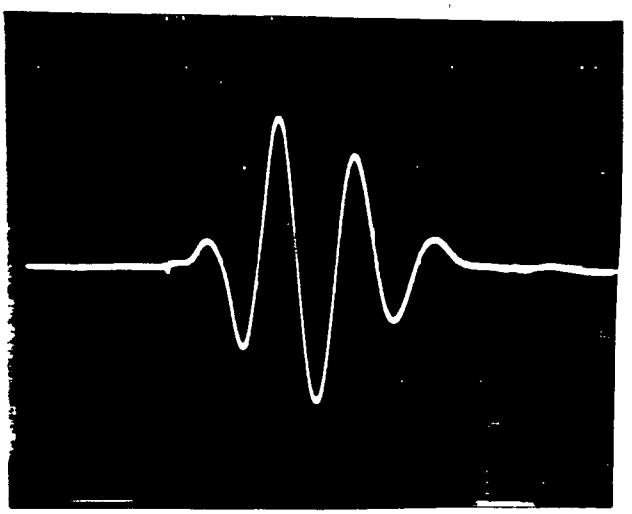
Intended Use: (Check One)

✓ Contact ___ Immersion ___ Other

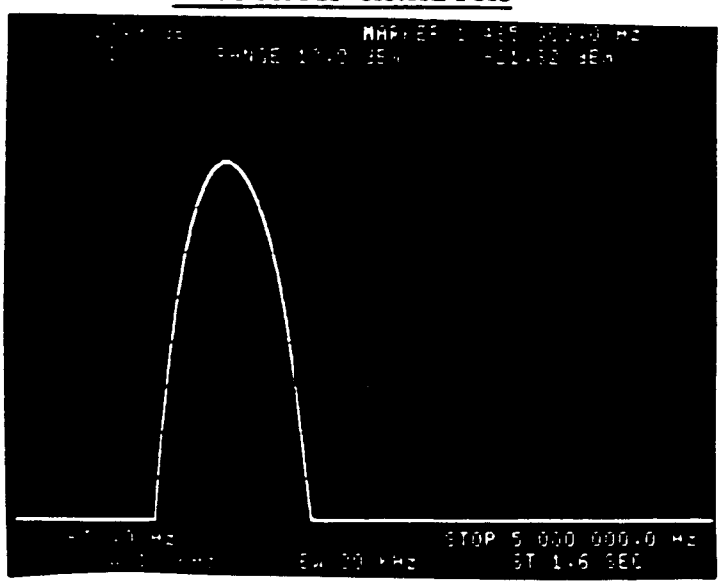
Connector MICRODOT

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N N/A

Block Material LUCITE

Block Dimension Used 1.0"

Cable Type RG174/U Length 6'

Pulser/Receiver:

Gain 40 Energy 2

Receiver Attenuation 34 db

Receiver Damping 200 Ohms

3 db Limits: Lower 1.235 MHz

Upper 1.775 MHz

Center Freq. 1.505 MHz

6 db Limits: Lower 1.145 MHz

Upper 1.885 MHz

Measured Peak Freq. 1.485 MHz

Bandwidth 0.74 MHz

Measured Angle N/A ° in N/A

REMARKS

Certification Performed By:

Kenneth Bush

Date 12-17-91 Accepted ✓ Rejected ___

By [signature] UT Level III

NUCLEAR ENERGY SERVICES

TRANSDUCER CERTIFICATION

N. MacManus 1-9-85
REVIEWED BY DATE

Transducer Description

Series GAMMA S/N 15233

Frequency 1.5 MHz Size .375

Style MSWQC Connector MD

☒ Contact ☐ Immersion ☐ Nonfocused

Water Path DA ☐ Spherical

Target 1" Plex ☐ Cylindrical

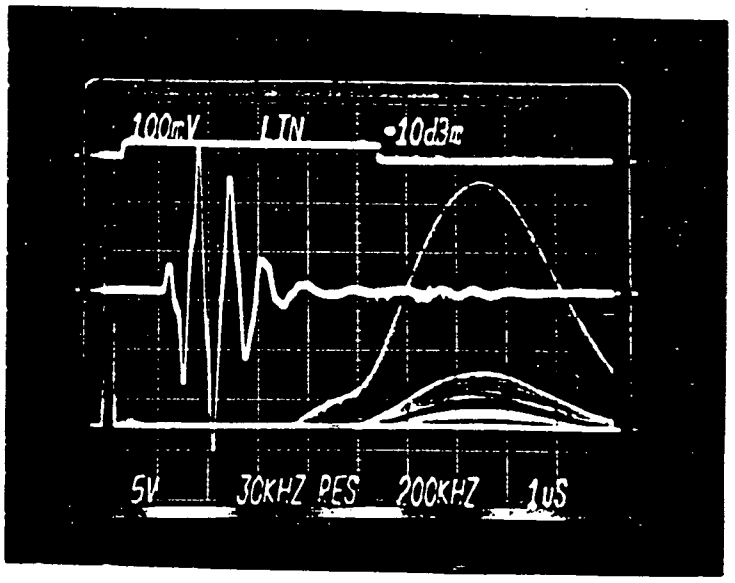
Relative Sensitivity 26 dB

Energy Setting 2 Impedance 50

☒ Peak or ☐ Center Frequency 1.5 MHz

Inspector SCD Date 11-25-85

.2
.2
1.5



TRACE I
TRACE II
TRACE III

A B C D E F

Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a flat steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate usin a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

Using an AEROTECH Ultrasonic Transducer Analyzer, Model UTA-4, and a Tektronix 7L12 frequency spectrum analyzer in a 7704A Mainframe, the real time waveform, UTA-4 gate signal, and the frequency spectrum of the gated signal are simultaneously displayed and photographed. Using the linear attenuator in the UTA-4 receiver, the amplitude of the real time waveform is adjusted to a six centimeter amplitude (± 1 dB) on the CRT. With the vertical calibration of Trace II fixed at 100 millivolts per division, the amount of attenuation used provides a relative sensitivity rating for all transducers certified by Krautkramer Branson.

Real Time Waveform - Trace II

Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for Trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

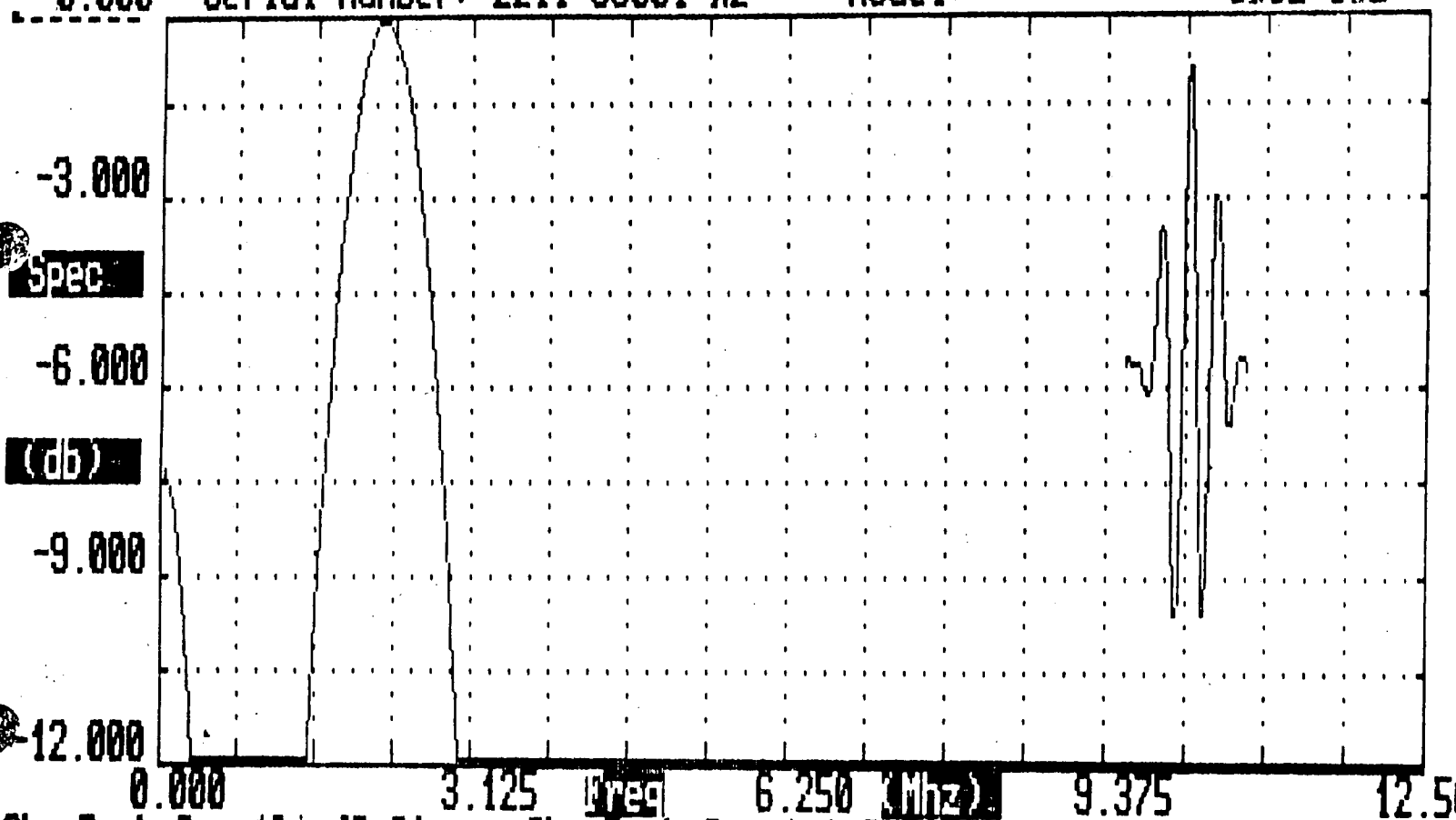
Frequency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B and show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

PROBE_TEST_TRANSDUCER_EVALUATION_SYSTEM
Report Date: Tue Mar 02 02:57:49 1993

0.000 Serial Number: 22I1-93001 R2 Model: SDC2-60L ♪♪♪♪



Abs Peak Amp (%):43.31	Abs Peak Amp (v):0.217	Avg Abs Value(%):11.81
Avg Abs Value(v):0.059	Rise Time (us):0.520	Fall Time (us):0.560
Envel Len (us):1.280	Peak Freq (mhz):2.197	Cntr Freq (mhz):2.221
Low -6 dB (mhz):1.689	Hi -6 dB (mhz):2.753	Low -20 dB (mhz):1.243
Hi -20 dB (mhz):3.160	BW @ -6 dB (mhz):1.063	BW @ -6 dB (%):47.9

USER PARAMETERS

Record #2

TRANSDUCER ENTRIES

Serial Number:	2211-93001 R2	Model:	SDC2-60L
Manufacturer:	SIGMA	Transducer Type:	MAN DUAL
Elem. Size(in):	2(12X25mm)	Focal Length (in):	2.40 (61mm)
Des. Freq(MHz):	2.0	Date Purchased:	FEB 93

PULSER RECEIVER ENTRIES

Manufacturer:	KB-AEROTECH	Tuning:	1.5 TX	uh
Model/Type:	UTA-4	Attenuation:	33	dB
Serial Number:	0255	Energy:	2(120 VOLT)	
Last Calibrate:	6/92	Receiver Imped.:	500	OHM

USER ENTRIES

Tester:	JAL	Cal Block Type:	4.0" RAD.BLK.
Date of Test:	02/24/93	Cal Block Mat'l:	SS
Series Number:	1	Lens Type:	NONE
Hours of Use:	0	Wedge Material:	LUCITE

COMMENTS

CAROLINA PWR & LITE PROJ 1034-2
3-13/25E2

C P + L

PANAMETRICS 221 CRESCENT STREET WALTHAM MASSACHUSETTS 02254 617 899-2719 TELEX 923408

CONTACT TRANSDUCER ANALYSIS

PART NO. A404- SERIAL NO. 56760 FREQUENCY 2.25 MHz

SIZE .50 " DIAMETER: — " by — " CABLE: RG- 174, LENGTH 4'

ECHO FROM BACK SURFACE OF: _____ " THICK FUSED SILICA.

1.0 " THICK LUCITE.

_____ " THICK POLYSTYRENE.

_____ "

TEST INSTRUMENTATION

___ PANAMETRICS 5052PR,01 PULSER AND GATE #_____

✓ PANAMETRICS 5052UA OR 5030A # 5

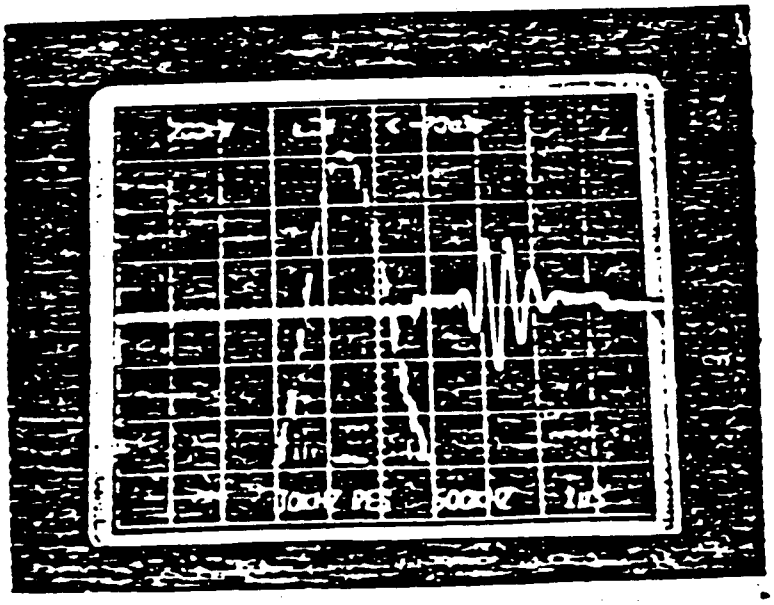
TEKTRONIX 7704A OSCILLOSCOPE SYSTEM

With 7A26 DUAL TRACE AMPLIFIER

7B53A DUAL TIME BASE

7L12 SPECTRUM ANALYZER

Center frequency is determined by multiplying the horizontal scan width by the number of divisions to the spectrum peak. 3 4



WAVEFORM

PULSER RECEIVER SETTINGS:

ENERGY SETTING 1.

RECEIVER ATTENUATION 44 dB

RECEIVER DAMPING 100 OHMS

OSCILLOSCOPE SETTINGS:

1 - Vertical Sensitivity/div.

2 - Horizontal Sweep Rate/div.

SPECTRUM ANALYSIS

3 - Scale Format.

4 - Horizontal Scan Width/div.

5 - Resolution.

6 - Input Attenuation.

TECHNICIAN [signature]

DATE 5/15/82

CP+L

PANAMETRICS 221 CRESCENT STREET, WALTHAM, MASSACHUSETTS 02254 / 617 899-2719 TELEX: 923406

CONTACT TRANSDUCER ANALYSIS

PART NO. A404S SERIAL NO. 56761 FREQUENCY 2.25 MHz

SIZE: .50 " DIAMETER: N/A " by N/A " CABLE: RG- 58/U, LENGTH 4

ECHO FROM BACK SURFACE OF: _____ " THICK FUSED SILICA.

1.0 " THICK LUCITE.

_____ " THICK POLYSTYRENE.

_____ "

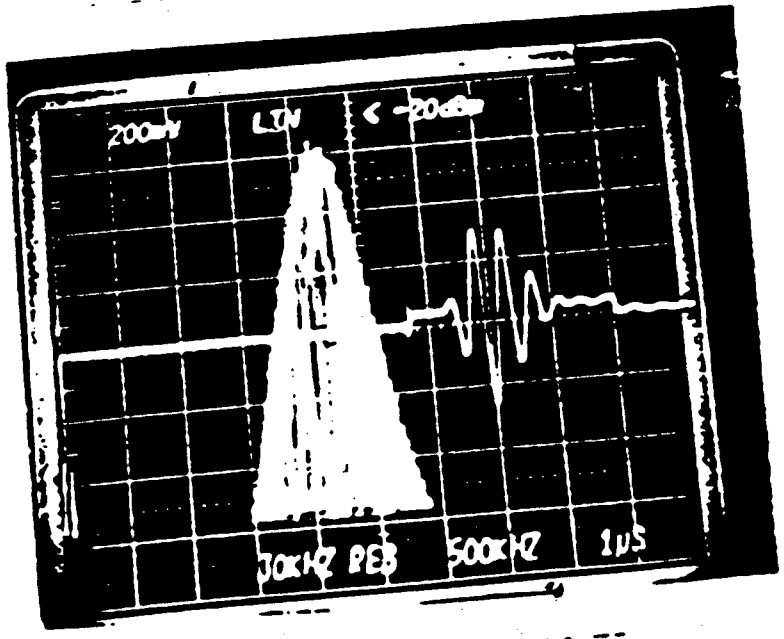
TEST INSTRUMENTATION

_____ PANAMETRICS 5052(PR,G) PULSER AND GATE #_____

✓ PANAMETRICS 5052UA OR 5030A # 3

TRONIX	7704A	OSCILLOSCOPE SYSTEM
with	7A26	DUAL TRACE AMPLIFIER
	7B53A	DUAL TIME BASE
	7L12	SPECTRUM ANALYZER

Center frequency is determined by fultiplying the horizontal scan width (4) by the number of divisions to the spectrum peak. 1 3 6



WAVEFORM

PULSER RECEIVER SETTINGS:

ENERGY SETTING 1

RECEIVER ATTENUATION 46

RECEIVER DAMPING 100 OH

OSCILLOSCOPE SETTINGS:

1 - Vertical Sensitivity/div

2 - Horizontal Sweep Rate/di

SPECTRUM ANALYSIS

3 - Scale Format.

4 - Horizontal Scan Width/d

5 - Resolution.

6 - Input Attenuation.

TECHNICIAN C Anderson

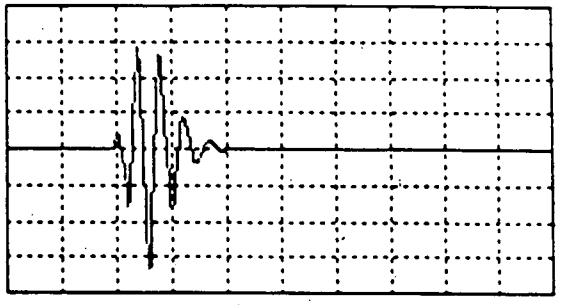
DATE 4/23/82

CP&L

Aerotech

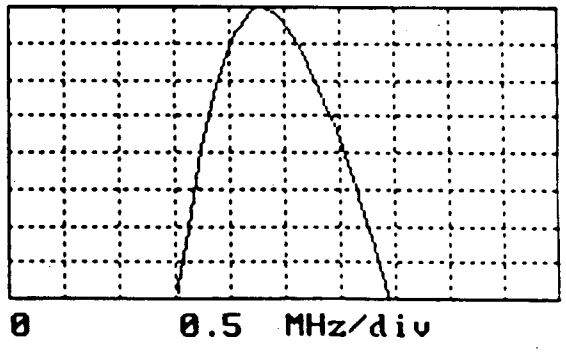
Transducer Certification

DATE: 01-27-1989
MODEL 113-222-580
SERIES: GAMMA STYLE: MSWS
SERIAL #A24932
DIAMETER: .25 in. CONNECTOR: MD
NOMINAL FREQUENCY: 2.25 MHz



TEST SETUP--
TEST BLOCK THICKNESS: 1.0 MATERIAL: PLEX
ENERGY SETTING: 2
IMPEDANCE SETTING: 50 OHMS

TEST DATA--
PEAK FREQUENCY: 2.29 MHz
RELATIVE SENSITIVITY: 23 dB
INSPECTOR: S.DIVEN



EQUIPMENT USED:
UTA-4 (S/N 103 CAL THRU 10-89)
TEK 2430 SCOPE (S/N B012909 CAL THRU 10-89)
TEK PEP301 CONTROLLER
PROCEDURE: WAVEFORM SHOWN IS THE FIRST RETURN ECHO FROM THE INDICATED TARGET

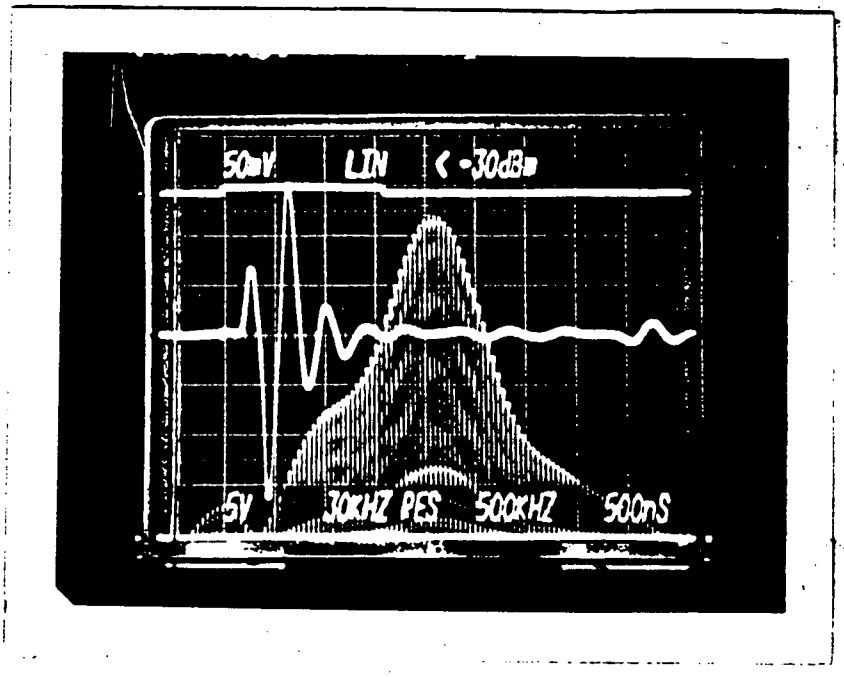
Krautkramer Branson
P.O. Box 350, Lewistown, PA 17044
(717) 242-0327 Fax: 717-242-2606

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: K. B. Aerotech S/N B02122

MARKED FREQUENCY: 2.25 MHz SIZE .25"



RESULTS

Central Scale 2.25 MHz (.5 MHz/Division)

Transducer Central Frequency 2.6 MHz

X Acceptable

_____ Unacceptable

Interpretation By M. Stamm 3/9/81
Date

SHELTER ROCK ROAD, DANBURY, CT 06810 (203) 748-3581

Report No. 551098S

ULTRASONIC SEARCH UNIT QUALIFICATION

SEARCH UNIT DATA

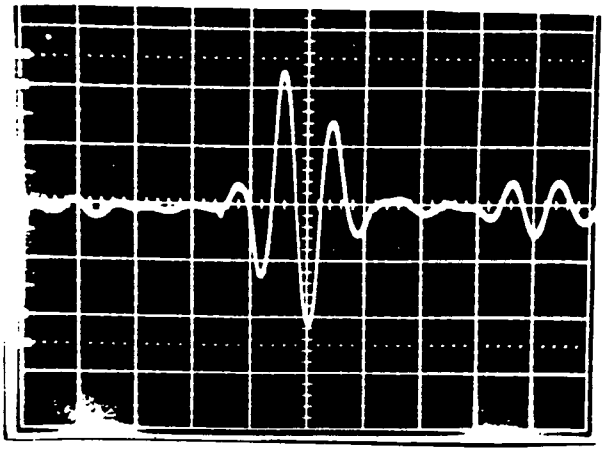
Manufacturer: KB Aerotech
Serial No.: B05236
Mfgr. Designation: Gamma B05-236
Nominal Angle: 0 ° (Check One)
☑ Long. ☐ Shear
Nominal Frequency: 2.25 MHz
Element Dimensions: .5 X .5" total
Element Material: N/A
Tuning: (Check One)
☐ Tuned ☑ Untuned
Intended Use: (Check One)
☑ Contact ☐ Immersion ☐ Other
Connector: Microdot
Peak Distance:
N/A in N/A
(Check One)
Flat Y_o N/A Peak(for dual) N/A
Line Focus N/A Point Focus N/A
Other: N/A

TEST DATA

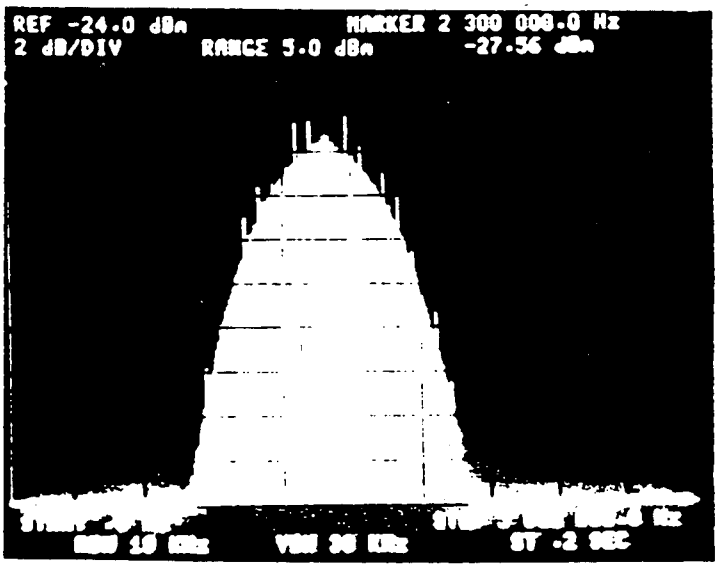
Test Block S/N:
Block Material: Carbon Steel
Block Dimension Used: 1"
Cable Type: RG 174 A/u
Cable Length: 2 (6')
Pulser/Receiver
Gain: 40 Energy: 2
Receiver Attenuation: 18 db
Receiver Damping: 200 Ohms
3 db Limits: Lower 1.81 MHz
Upper 2.77 MHz
Center Freq.: 2.29 MHz
6 db Limits: Lower 1.63 MHz
Upper 2.97 MHz
Measured Peak Freq.: 2.30 MHz
Bandwidth: 1.34 MHz
Measured Angle: 0L ° in CS

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



REMARKS

CERTIFICATION PERFORMED BY: David W Sowers
DATE: 9-26-85 (ACCEPTED) REJECTED
BY: Michael P. Wolcott UT LEVEL III
RECERTIFY BEFORE: N/A

TRANSDUCER CERTIFICATION 2/14/86 III

Transducer Description

Series Gamma S/N B07680

Frequency 2.25 MHz Size .50

Style MSWS Connector M.D.

☑ Contact ☐ Immersion ☑ Nonfocused

Water Path N/A ☐ Spherical

Target 1" Plex ☐ Cylindrical

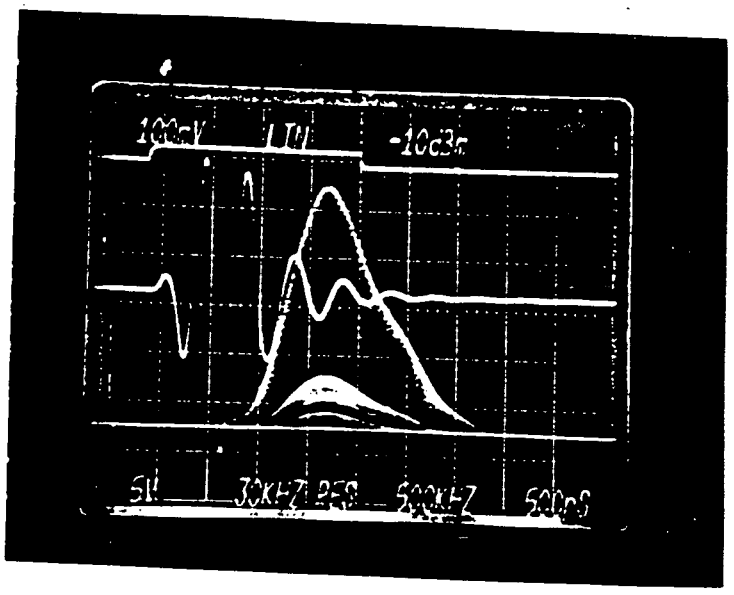
Relative Sensitivity 32.0 dB

Energy Setting 2 Impedance 50Ω

☑ Peak or ☐ Center Frequency 2.2 MHz

Inspector J.R.S. Date 2/14/86

A B



C D E F

Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a flat steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate usin a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

Using an AEROTECH Ultrasonic Transducer Analyzer, Model UTA-4, and a Tektronix 7L12 frequency spectrum analyzer in a 7704A Mainframe, the real time waveform, UTA-4 gate signal, and the frequency spectrum of the gated signal are simultaneously displayed and photographed. Using the linear attenuator in the UTA-4 receiver, the amplitude of the real time waveform is adjusted to a six centimeter amplitude (± 1 dB) on the CRT. With the vertical calibration of Trace II fixed at 100 millivolts per division, the amount of attenuation used provides a relative sensitivity rating for all transducers certified by Krautkramer Branson.

Real Time Waveform - Trace II

Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for Trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

Frequency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B and D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

Report No. 543D985

ULTRASONIC SEARCH UNIT QUALIFICATION

SEARCH UNIT DATA

Manufacturer: Aerotech

Serial No.: B25120

Mfgr. Designation: Gamma

Nominal Angle: 0° (Check One)

☑ Long. ☐ Shear

Nominal Frequency: 2.25 MHz

Element Dimensions: .5" dia

Element Material: N/A

Tuning: (Check One)

☐ Tuned ☑ Untuned

Intended Use: (Check One)

☑ Contact ☐ Immersion ☐ Other

Connector: Microdot

Peak Distance:

N/A in N/A

(Check One)

Flat Y. N/A Peak(for dual) N/A

Line Focus N/A Point Focus N/A

Other: N/A

TEST DATA

Test Block S/N: N/A

Block Material: UVA II

Block Dimension Used: 1"

Cable Type: RG-174 A/U

Cable Length: 6'

Pulser/Receiver

Gain: 40 Energy: 4

Receiver Attenuation: 36 db

Receiver Damping: 100 Ohms

3 db Limits: Lower 1.82 MHz

Upper 2.52 MHz

Center Freq.: 2.17 MHz

6 db Limits: Lower 1.67 MHz

Upper 2.67 MHz

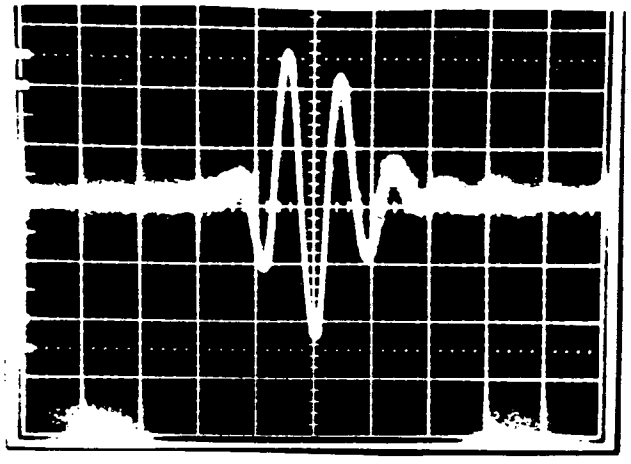
Measured Peak Freq.: 2.17 MHz

Bandwidth: 1.00 MHz

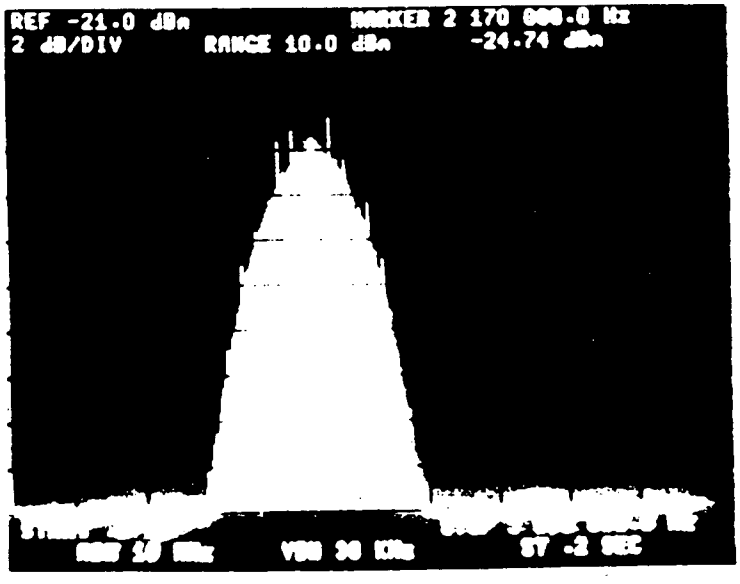
Measured Angle: 0L° in UVA II

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



REMARKS

CERTIFICATION PERFORMED BY: [signature]

DATE: 9-26-85 (ACCEPTED) REJECTED

BY: Michael T. Wolcott UT LEVEL III

RECERTIFY BEFORE: N/A

NDE

ULTRASONIC SEARCH UNIT QUALIFICATION

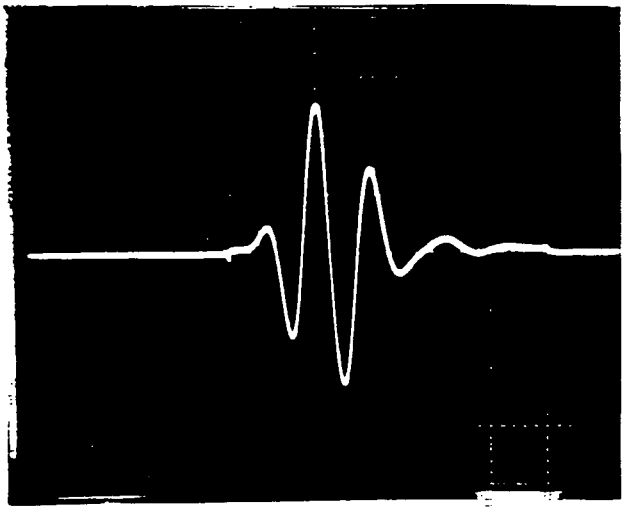
Report No. 9711221

SEARCH UNIT DATA

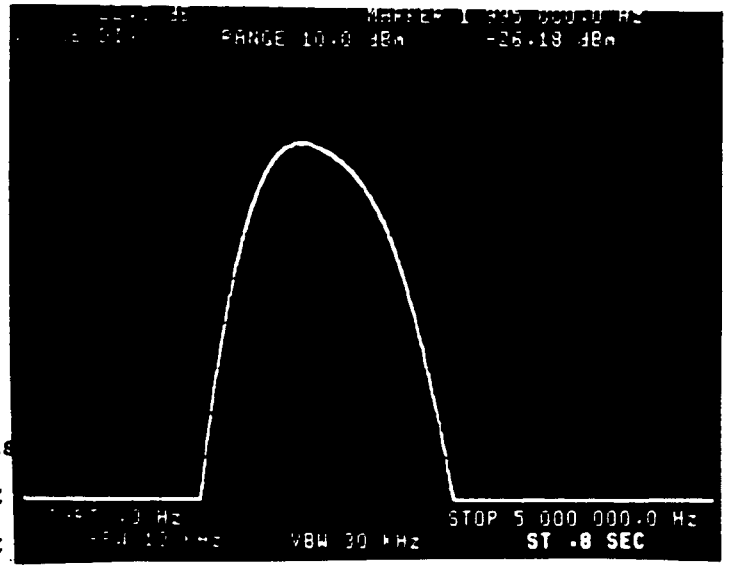
Manufacturer Aerotech
Serial No. C09104
Mfgr. Designation SWS GAMMA
Nominal Angle N/A ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25MHz
Element Dimensions .5 x 1.0
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector BNC

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N N/A
Block Material LUCITE
Block Dimension Used 1.0"
Cable Type RG 58 A/U Length 6'
Pulser/Receiver:
Gain 40 Energy 4
Receiver Attenuation 38 db
Receiver Damping 50 Ohms
3 db Limits: Lower 1.625 MHz
Upper 2.565 MHz
Center Freq. 2.09 MHz
6 db Limits: Lower 1.50 MHz
Upper 2.75 MHz
Measured Peak Freq. 1.995 MHz
Bandwidth 1.25 MHz
Measured Angle N/A ° in N/A

REMARKS

Certification Performed By:

Date 12-18-91 Accepted ✓ Rejected N/A
By _____ UT Level III

Report No. 7160187

ULTRASONIC SEARCH UNIT QUALIFICATION

SEARCH UNIT DATA

Manufacturer: K-B Aerotech

Serial No.: D10657

Mfgr. Designation: Gamma

Nominal Angle: 0 ° (Check One)

☑ Long. ☐ Shear

Nominal Frequency: 2.25 MHz

Element Dimensions: 0.50"

Element Material: N/A

Tuning: (Check One)

☐ Tuned ☑ Untuned

Intended Use: (Check One)

☑ Contact ☐ Immersion ☐ Other

Connector: Microdot

Peak Distance:

N/A in N/A

(Check One)

Flat Y_o N/A Peak(for dual) N/A

Line Focus N/A Point Focus N/A

Other: N/A

TEST DATA

Test Block S/N: N/A

Block Material: UVA 2

Block Dimension Used: 1"

Cable Type: RG 174 U

Cable Length: 6'

Pulser/Receiver

Gain: 40 Energy: 1

Receiver Attenuation: 34 db

Receiver Damping: 200 Ohms

3 db Limits: Lower 1.75 MHz

Upper 2.69 MHz

Center Freq.: 2.22 MHz

6 db Limits: Lower 1.62 MHz

Upper 2.85 MHz

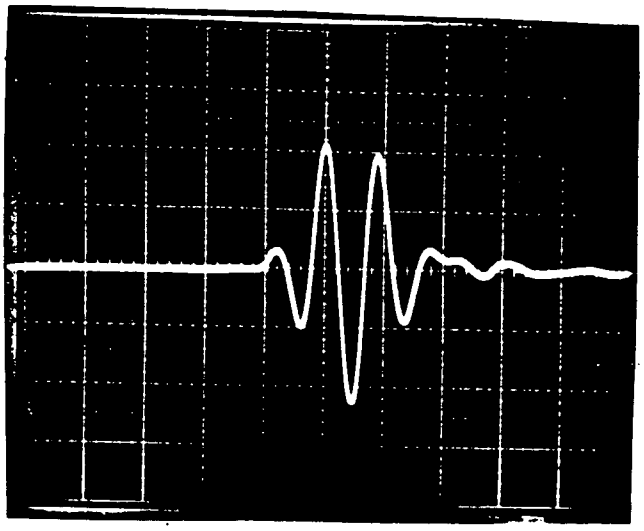
Measured Peak Freq.: 2.18 MHz

Bandwidth: 1.23 MHz

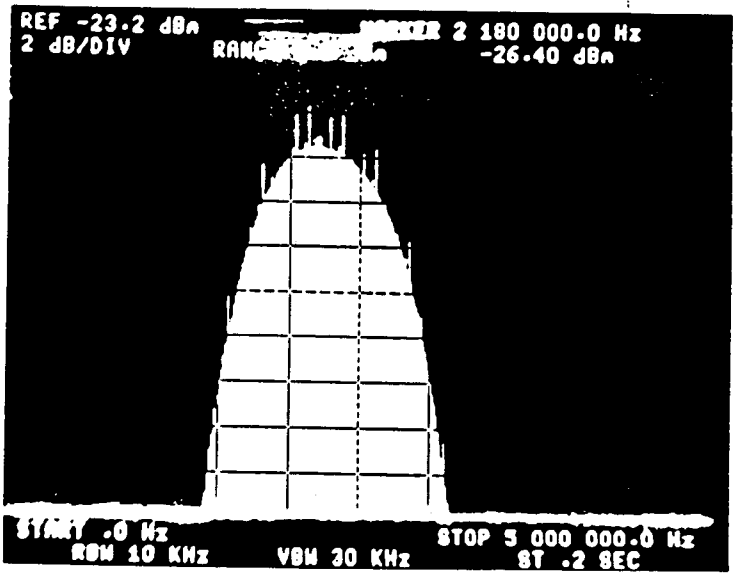
Measured Angle: 0 ° in UVA 2

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



REMARKS

CERTIFICATION PERFORMED BY: John J Hayden

DATE: 1/14/87 ACCEPTED REJECTED

BY: John J Hayden 1/14/87 UT LEVEL III

RECERTIFY BEFORE: N/A

NUCLEAR ENERGY SERVICES

E18404

TRANSDUCER CERTIFICATION

Transducer Description

Type Gamma S/N E18404

Frequency 2.25 MHz Size .50"

Style MSWS Connector M.G.

☑ Contact ☐ Immersion ☐ Nonfocused

Water Path _____ ☐ Spherical

Target 1.0" Plexiglas ☐ Cylindrical

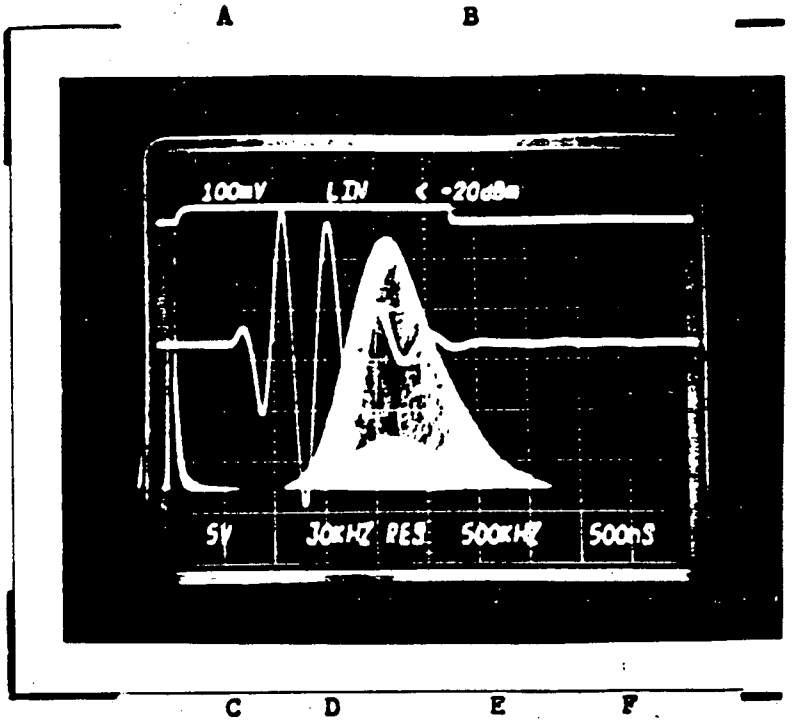
Relative Sensitivity 37 dB

Energy Setting 2 Impedance 50Ω

☑ Peak or ☐ Center Frequency 2.1 MHz

Inspector JCF Date 5-29-84

Approved: [signature] III 7/31/91



Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a flat steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate using a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

Using an AEROTECH Ultrasonic Transducer Analyzer, Model UTA-4, and a Tektronix 7L12 frequency spectrum analyzer in a 7704A Mainframe, the real time waveform, UTA-4 gate signal, and the frequency spectrum of the gated signal are simultaneously displayed and photographed. Using the linear attenuator in the UTA-4 receiver, the amplitude of the real time waveform is adjusted to a six centimeter amplitude (± 1 dB) on the CRT. With the vertical calibration of Trace II fixed at 100 millivolts per division, the amount of attenuation used provides a relative sensitivity rating for all transducers certified by Krautkramer Branson.

Real Time Waveform - **Trace II**

Screen writing figures **A** and **F** provide the vertical and horizontal screen calibration respectively for **Trace II.**

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

Frequency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B and D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810. (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

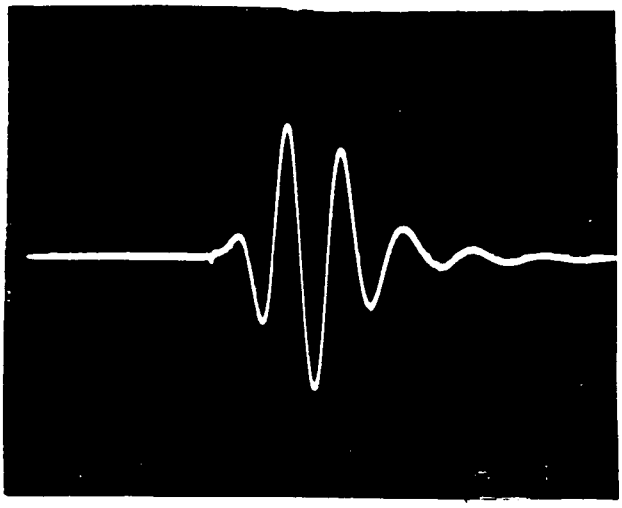
Report No. 9611291

SEARCH UNIT DATA

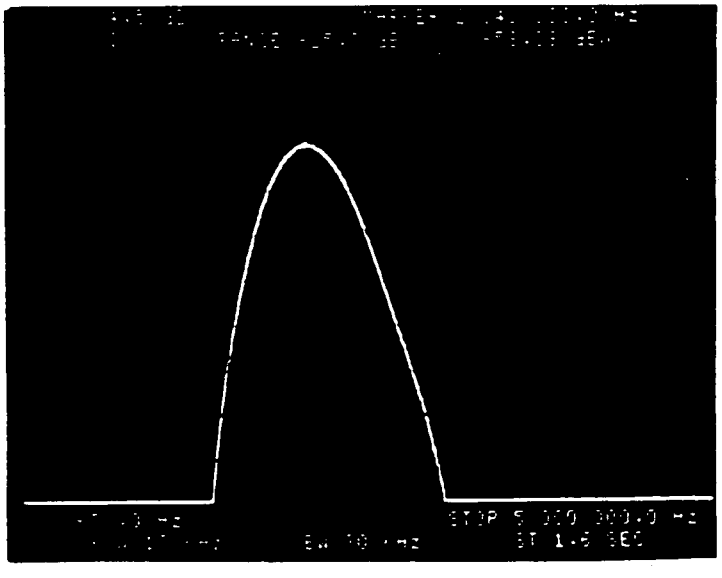
Manufacturer Aerotech
Serial No. E20000
Mfgr. Designation MSWS
Nominal Angle N/A ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25 MHz
Element Dimensions 0.5" Dia
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector MICRODOT

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N N/A
Block Material Lucite
Block Dimension Used 1.0"
Cable Type RG174/U Length 6'
Pulser/Receiver:
Gain 40 Energy 2
Receiver Attenuation 38 db
Receiver Damping 200 Ohms
3 db Limits: Lower 1.71 MHz
Upper 2.415 MHz
Center Freq. 2.0625 MHz
6 db Limits: Lower 1.585 MHz
Upper 2.585 MHz
Measured Peak Freq. 2.04 MHz
Bandwidth 1.00 MHz
Measured Angle N/A ° in N/A

REMARKS

Certification Performed By:
Kenneth Bruce

Date 12-17-91 Accepted ✓ Rejected ___
By _____ UT Level III

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

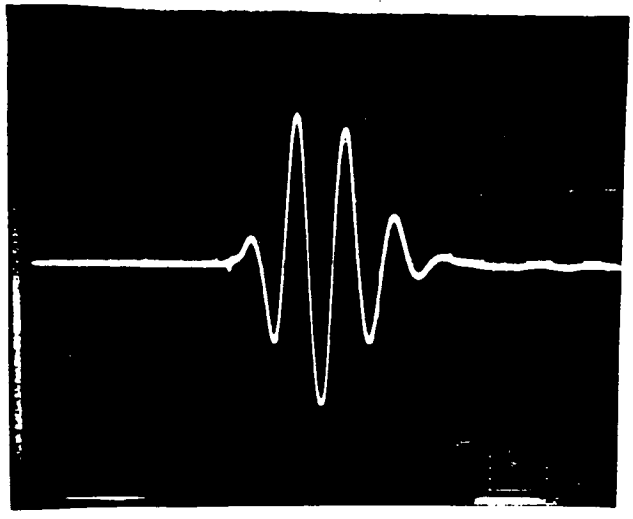
Report No. 9621291

SEARCH UNIT DATA

Manufacturer Aerotech
Serial No. E24700
Mfgr. Designation MSWS
Nominal Angle N/A ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25
Element Dimensions .25" Dia.
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector MICRODOT

REAL TIME WAVEFORM

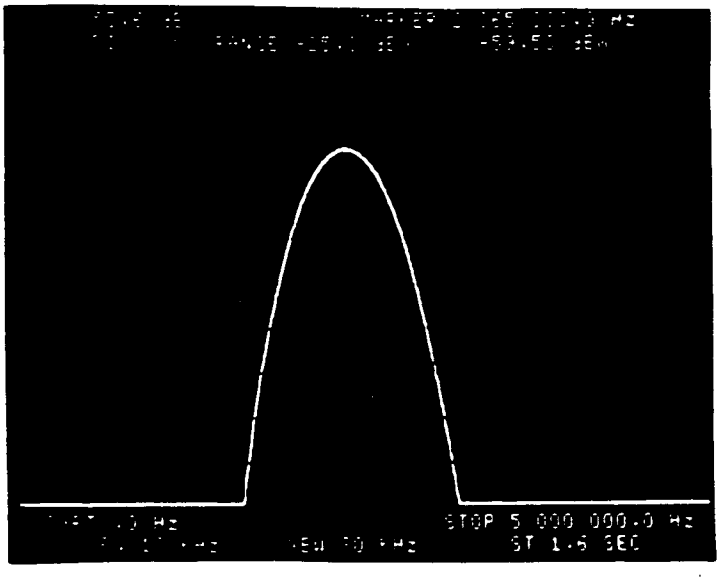
.5 uS/Div. .5 Volts/Div.



TEST DATA

Test Block S/N N/A
Block Material LUCITE
Block Dimension Used 1.0"
Cable Type RG174/U Length 6'
Pulser/Receiver:
Gain 40 Energy 2
Receiver Attenuation 24 db
Receiver Damping 200 Ohms
3 db Limits: Lower 2.010 MHz
Upper 2.735 MHz
Center Freq. 2.3725 MHz
6 db Limits: Lower 1.87 MHz
Upper 2.88 MHz
Measured Peak Freq. 2.365 MHz
Bandwidth 1.01 MHz
Measured Angle N/A ° in N/A

SPECTRUM ANALYSIS



REMARKS

Certification Performed By:
Kenneth Price

Date 12-17-91 Accepted ✓ Rejected N/A
By [signature] UT Level III

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

Report No. 977129/

SEARCH UNIT DATA

Manufacturer KRAUTKRAMER

Serial No. E26683

Mfgr. Designation WSY 70-4 54576

Nominal Angle 70 ° (Check One)

✓ Long. ___ Shear

Nominal Frequency 4.0 MHz

Element Dimensions 10MM SQ.

Tuning: (Check One)

✓ Tuned ___ Untuned

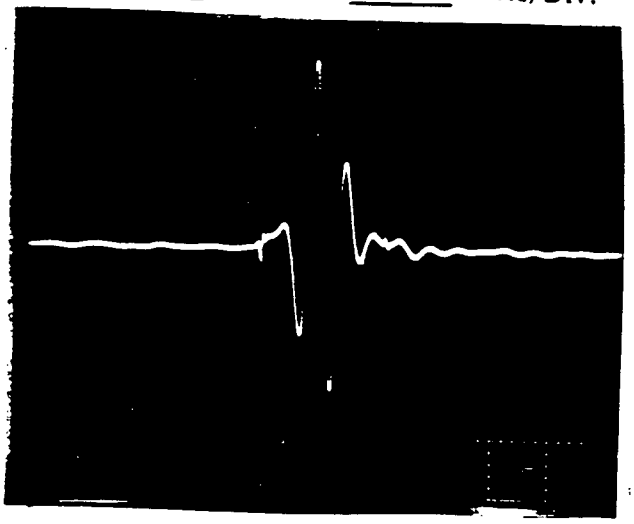
Intended Use: (Check One)

✓ Contact ___ Immersion ___ Other

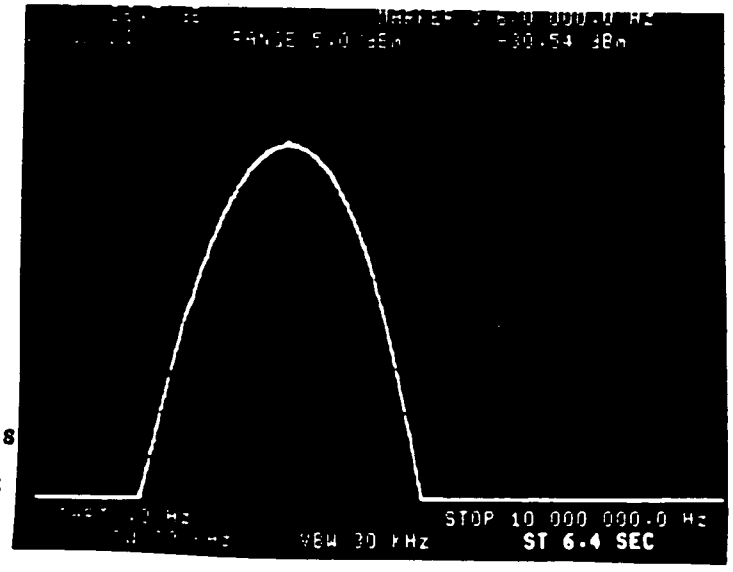
Connector LEMO

REAL TIME WAVEFORM

0.5 uS/Div. 0.2 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N 792221

Block Material CARBON STEEL

Block Dimension Used 1.0" RADIUS

Cable Type RG174/U Length 6'

Pulser/Receiver:

Gain 40 Energy 4

Receiver Attenuation 16 db

Receiver Damping 100 Ohms

3 db Limits: Lower 2.76 MHz

Upper 4.55 MHz

Center Freq. 3.655 MHz

6 db Limits: Lower 2.36 MHz

Upper 4.90 MHz

Measured Peak Freq. 3.67 MHz

Bandwidth 2.54 MHz

Measured Angle N/A ° in N/A

REMARKS

Certification Performed By:

Kenneth Bussin

Date 12-18-91 Accepted ✓ Rejected N/A

By _____ UT Level III

TRANSDUCER CERTIFICATION

Transducer Description

Series GAMMA S/N F11506

Frequency 5.0 MHz Size .25

Style MSW5 Connector MD

☑ Contact ☐ Immersion ☐ Nonfocused

Water Path DA ☐ Spherical

Target 1.0" P/E X ☐ Cylindrical

Relative Sensitivity 27 dB

Energy Setting 2 Impedance 50

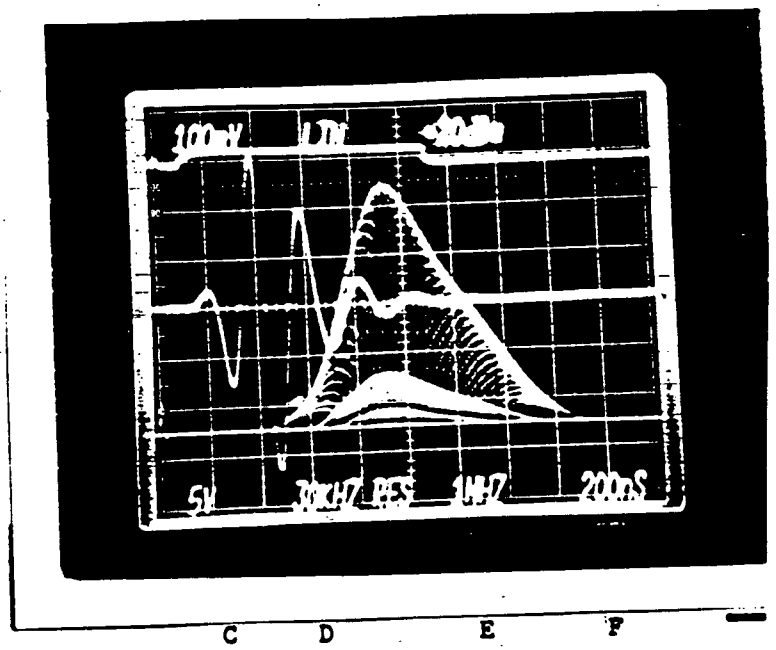
☑ Peak or ☐ Center Frequency 4.6 MHz

Inspector SCD Date 2-24-86

Reviewed by Curt Putman Level III

3-3-86

NUCLEAR ENERGY SERVICES



Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a flat steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate using a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

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Real Time Waveform - Trace II

Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for Trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

Frequency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B and D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

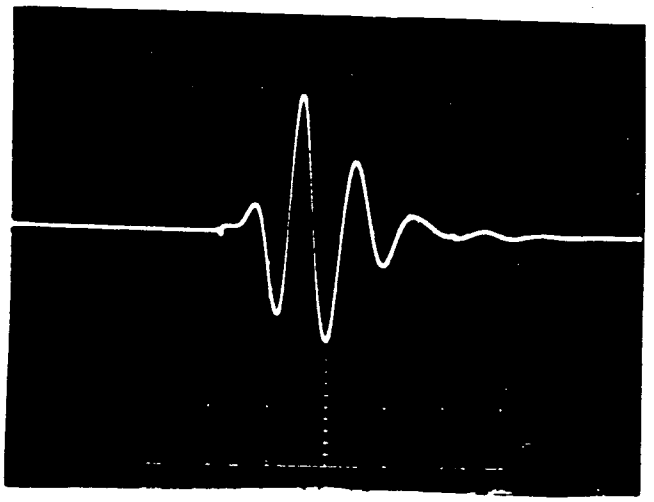
Report No. 8780588

SEARCH UNIT DATA

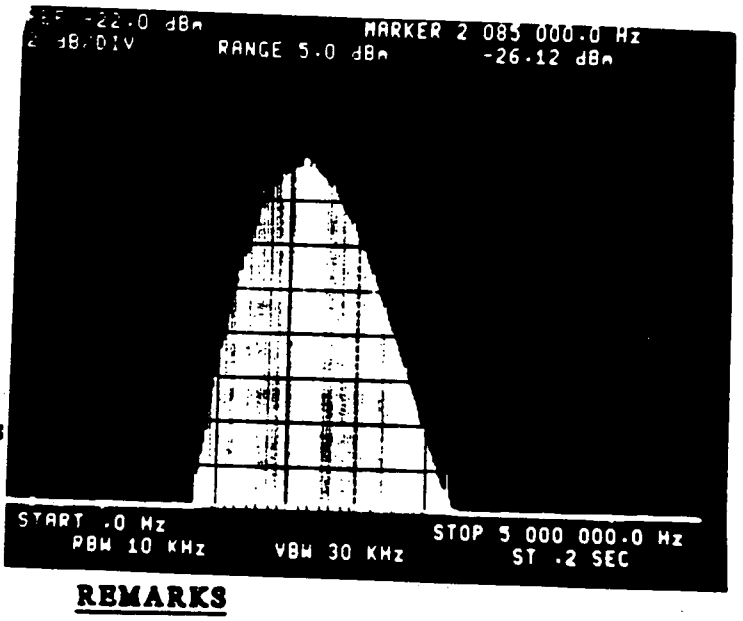
Manufacturer Acutech
Serial No. 6-09014
Mfgr. Designation Gamma HP
Nominal Angle 0 ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25 MHz
Element Dimensions 1.0 dia
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector BNC

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N 6045-83 mini Ramapus
Block Material Carbon Steel
Block Dimension Used 1"
Cable Type RG58 A/U Length 6'
Pulser/Receiver:
Gain 40 Energy 2
Receiver Attenuation 38 db
Receiver Damping 200 Ohms
3 db Limits: Lower 1.71 MHz
Upper 2.48 MHz
Center Freq. 2.09 MHz
6 db Limits: Lower 1.57 MHz
Upper 2.66 MHz
Measured Peak Freq. 2.08 MHz
Bandwidth 1.09 MHz
Measured Angle 0L ° in C. Steel

REMARKS

Certification Performed By:
[signature]
Date 5/27/88 Accepted ✓ Rejected ___
By [signature] UT Level III

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

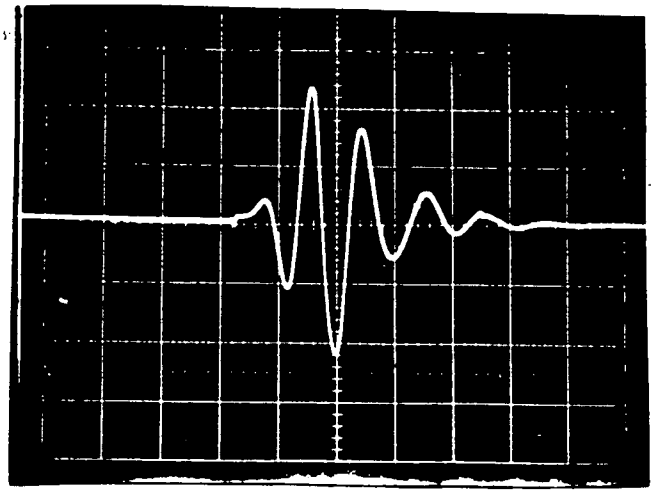
Report No. 8340388

SEARCH UNIT DATA

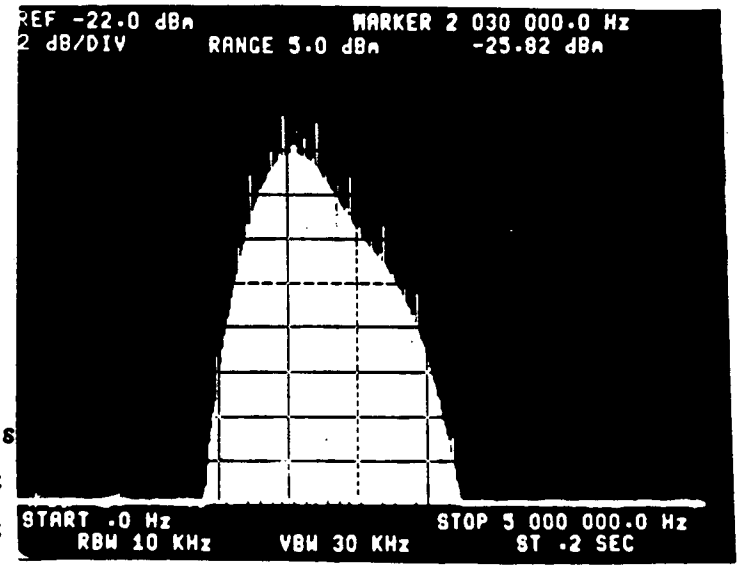
Manufacturer KB Aerotech
Serial No. G-10188
Mfgr. Designation Gamma
Nominal Angle 0 ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25 MHz
Element Dimensions 1/2 X 1"
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector SNC

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N NA
Block Material UVA II
Block Dimension Used 1"
Cable Type RG58 A/U Length 6'
Pulser/Receiver:
Gain 40 Energy 1
Receiver Attenuation 24 db
Receiver Damping 50 Ohms
3 db Limits: Lower 1.69 MHz
Upper 2.43 MHz
Center Freq. 2.06 MHz
6 db Limits: Lower 1.59 MHz
Upper 2.78 MHz
Measured Peak Freq. 2.03 MHz
Bandwidth 1.19 MHz
Measured Angle 0 ° in UVA II

REMARKS

Certification Performed By:

Date 3-21-88 ✓ Accepted ___ Rejected

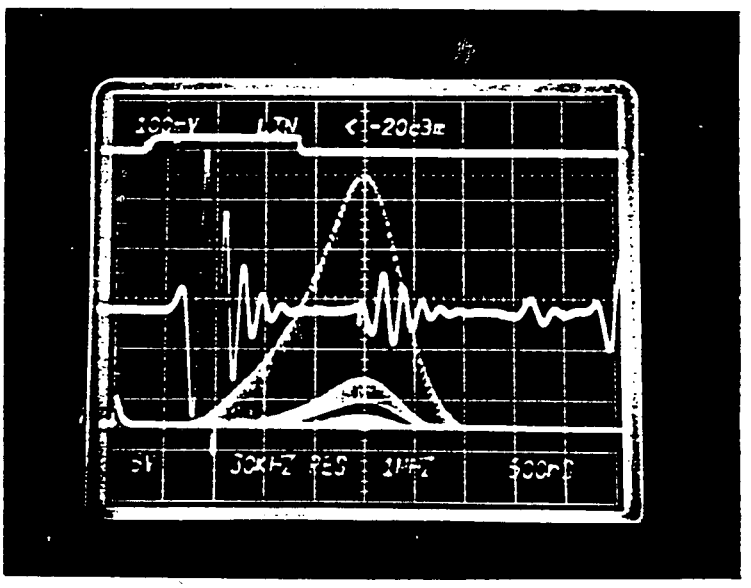
By 3/21/88 UT Level III

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: KRAUTKRAMER BRANSON S/N H26323

MARKED NOMINAL FREQUENCY: 5.0 SIZE .50"



RESULTS

HORIZONTAL SCALE 10 MHz (1 MHz/DIVISION)

TRANSDUCER CENTRAL FREQUENCY 5.0 MHz

XX ACCEPTABLE

_____ UNACCEPTABLE

INTERPRETATION BY S.L. Foote, Level III DATE 10/25/83

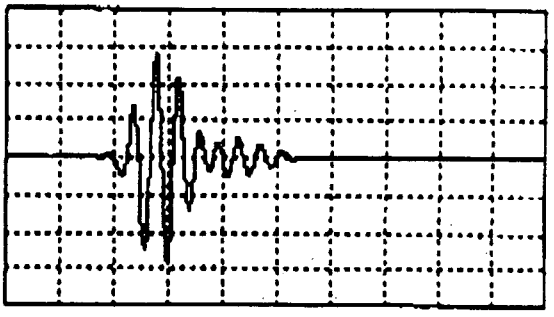
SHELTER ROCK ROAD, DANBURY, CT 06810
WRITER'S DIRECT DIALING NO.

(203) 796-5000
(203) 796-

Aerotech CP+L

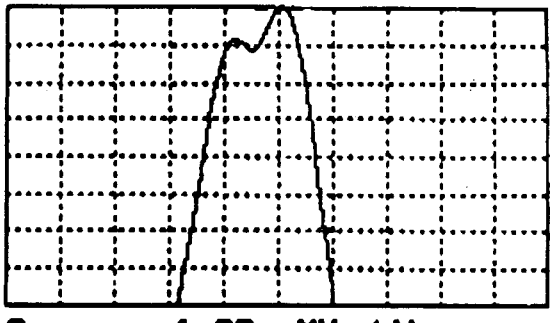
Transducer Certification

DATE: 08-30-1991
MODEL 113-224-700
SERIES: GAMMA STYLE: ADP
SERIAL #H28181
DIAMETER: .25 in. CONNECTOR: BNC
NOMINAL FREQUENCY: 5 MHz



TEST SETUP--
TEST BLOCK THICKNESS: 0.3 MATERIAL: STEEL
ENERGY SETTING: 2
IMPEDANCE SETTING: 100 OHMS

TEST DATA--
PEAK FREQUENCY: 4.99 MHz
RELATIVE SENSITIVITY: 33 dB
INSPECTOR: S.DIVEN



EQUIPMENT USED:
UTA-4 (S/N 103 CAL THRU 10-91)
TEK 2430 SCOPE (S/N B012909 CAL THRU 10-91)
TEK PEP301 CONTROLLER
PROCEDURE: WAVEFORM SHOWN IS THE FIRST RETURN ECHO FROM THE INDICATED TARGET

THE ACCURACY OF THE INSTRUMENT DESCRIBED ABOVE HAS BEEN CONFIRMED BY FACTORY STANDARD TEST EQUIPMENT AND LABORATORY REFERENCE STANDARDS TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

Krautkramer Branson
P.O. Box 350, Lewistown, PA 17044
(717) 242-0327 Fax: 717-242-2606

Report No. 4320486

ULTRASONIC SEARCH UNIT QUALIFICATION

SEARCH UNIT DATA

Manufacturer: KB AEROTECH

Serial No.: JT09185

Mfgr. Designation: Gamma

Nominal Angle: 0 ° (Check One)

☒ Long. ☐ Shear

Nominal Frequency: 2.25 MHz

Element Dimensions: 1/4" Round

Element Material: N/A

Tuning: (Check One)

☐ Tuned ☒ Untuned

Intended Use: (Check One)

☒ Contact ☐ Immersion ☐ Other

Connector: Microdot

Peak Distance:

N/A in N/A

(Check One)

Flat Yo N/A Peak(for dual) N/A

Line Focus N/A Point Focus N/A

N/A Other: N/A

TEST DATA

Test Block S/N: N/A

Block Material: IIW2

Block Dimension Used: 1"

Cable Type: 174 A/U

Cable Length: 6'

Pulser/Receiver

Gain: 40 Energy: 1

Receiver Attenuation: 26 db

Receiver Damping: 500 Ohms

-6 db Limits: Lower 1.99 MHz

Upper 2.80 MHz

Center Freq.: 2.39 MHz

-6 db Limits: Lower 1.87 MHz

Upper 2.94 MHz

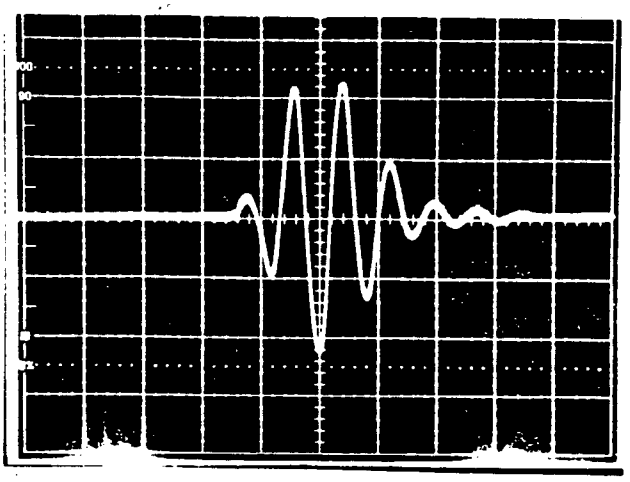
Measured Peak Freq.: 2.41 MHz

Bandwidth: 1.07 MHz

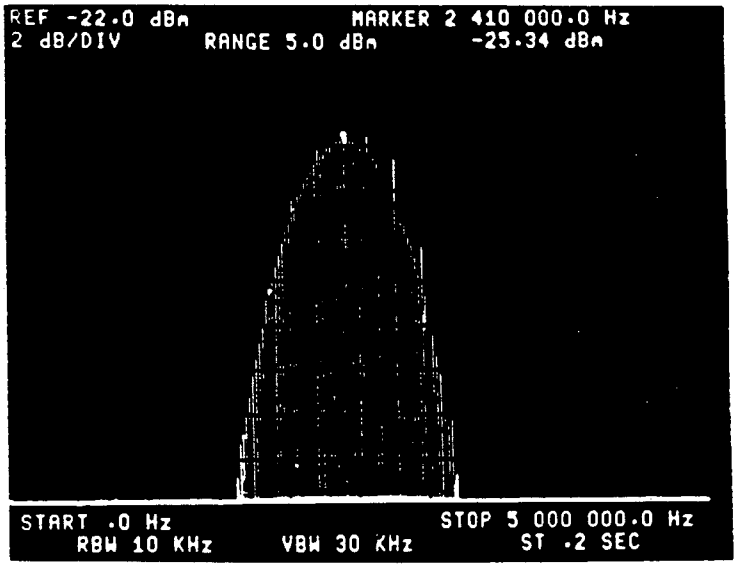
Measured Angle: 0 ° in IIW2

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



REMARKS

CERTIFICATION PERFORMED BY: [signature]

DATE: 4/29/86 ACCEPTED 4/29/86 REJECTED

BY: [signature] UT LEVEL III

RECERTIFY BEFORE: N/A

NES NUCLEAR ENERGY SERVICES, INC.

TRANSDUCER CERTIFICATION

Reviewed - N. MacNamara 1-8-86

Transducer Description

Series GAMMA HP S/N J10523

Frequency 2.25 MHz Size 50

Style F Connector MD

☑ Contact ☐ Immersion ☐ Nonfocused

Water Path NA ☐ Spherical

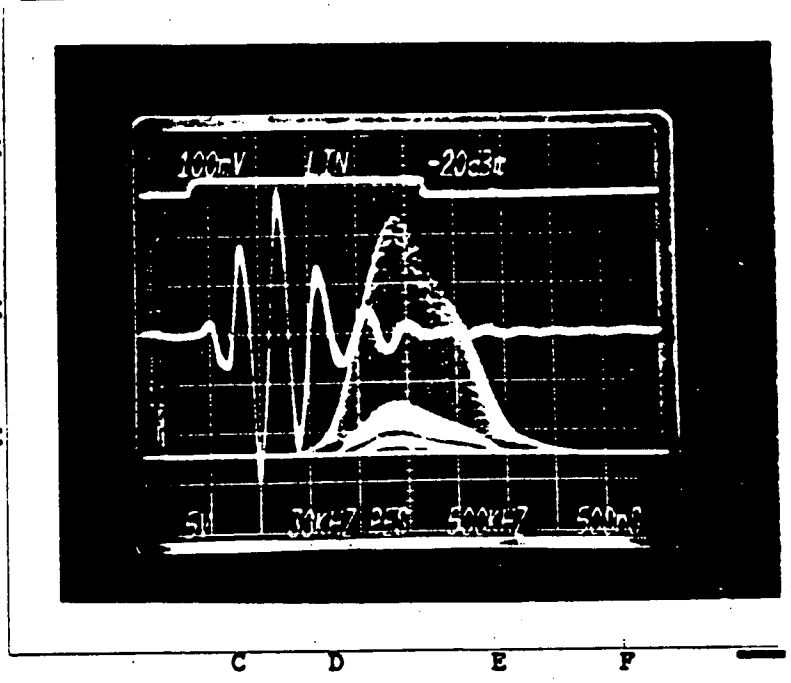
Target 3" STEEL ☐ Cylindrical

Relative Sensitivity 64 dB

Energy Setting 4 Impedance 250

☑ Peak or ☐ Center Frequency 2.4 MHz

Inspector SCD Date 12-20-85



Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a flat steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate using a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

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Real Time Waveform - Trace II

Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for Trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

Frequency Spectrum - Trace III

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KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

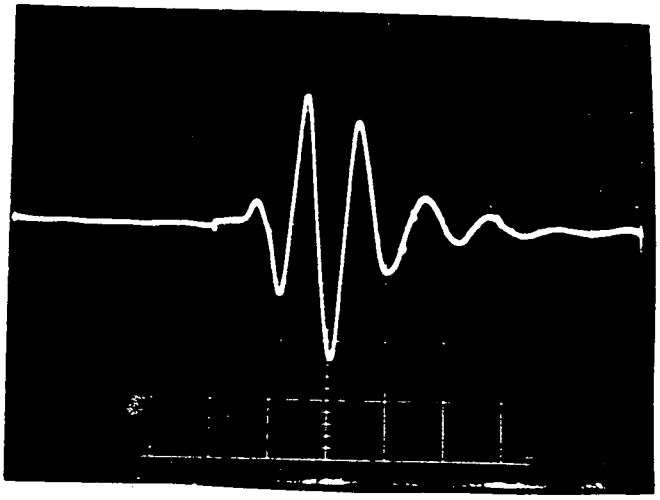
Report No. 8720588

SEARCH UNIT DATA

Manufacturer KB Aerotech
Serial No. KC3904
Mfgr. Designation Gamma
Nominal Angle 0 ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 1.0 MHz
Element Dimensions ½ x 1"
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector BNC

REAL TIME WAVEFORM

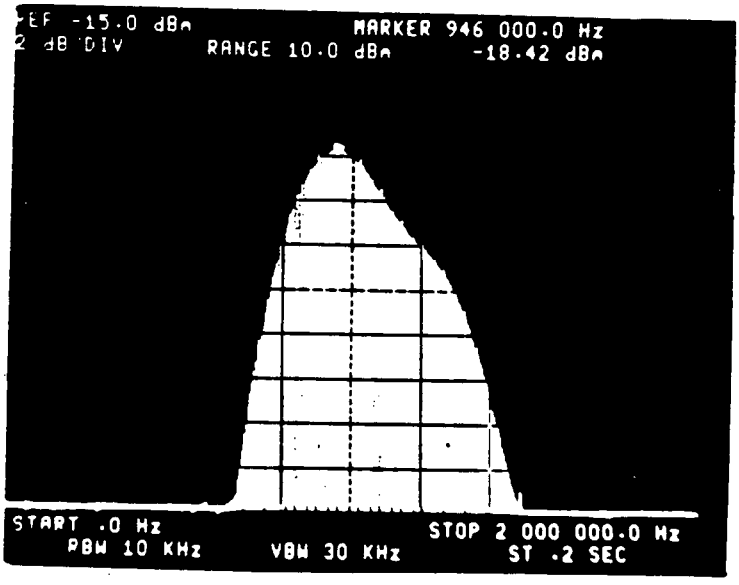
1.0 uS/Div. .5 Volts/Div.



TEST DATA

Test Block S/N NA
Block Material UVA II
Block Dimension Used 1"
Cable Type RG58A/U Length 6'
Pulser/Receiver:
Gain 40 Energy 1
Receiver Attenuation 32 db
Receiver Damping 200 Ohms
3 db Limits: Lower 0.80 MHz
Upper 1.13 MHz
Center Freq. 0.96 MHz
6 db Limits: Lower 0.75 MHz
Upper 1.28 MHz
Measured Peak Freq. 0.95 MHz
Bandwidth 0.53 MHz
Measured Angle 0L ° in UVA II

SPECTRUM ANALYSIS



REMARKS

Certification Performed By:

Date 5/21/88 Accepted ✓ Rejected ___

By _____ UT Level III

NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

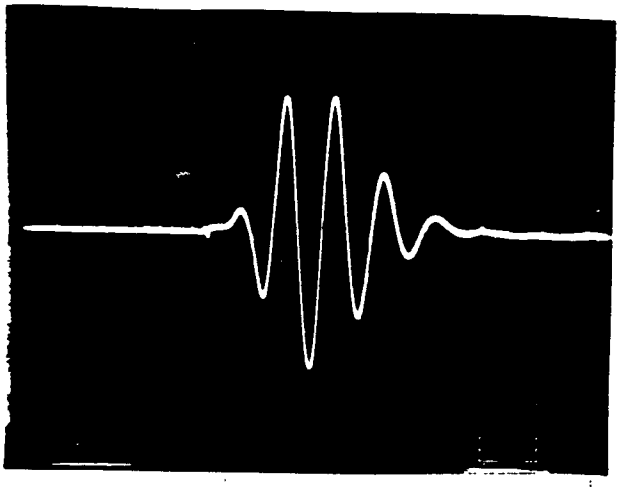
Report No. 9641291

SEARCH UNIT DATA

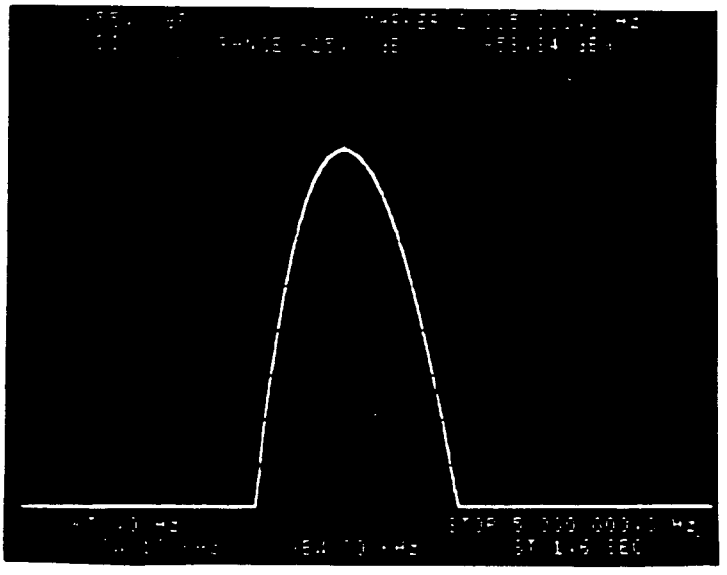
Manufacturer Aerotech
Serial No. K05973
Mfgr. Designation MSWS
Nominal Angle N/A ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25MHz
Element Dimensions .25" Dia.
Tuning: (Check One)
___ Tuned ✓ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector MICRODOT

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N N/A
Block Material Lucite
Block Dimension Used 1.0"
Cable Type RG-174/U Length 6'
Pulser/Receiver:
Gain 40 Energy 1
Receiver Attenuation 20 db
Receiver Damping 200 Ohms
3 db Limits: Lower 2.02 MHz
Upper 2.68 MHz
Center Freq. 2.35 MHz
6 db Limits: Lower 1.90 MHz
Upper 2.83 MHz
Measured Peak Freq. 2.335 MHz
Bandwidth 0.93 MHz
Measured Angle N/A ° in N/A

REMARKS

Certification Performed By:
Kenneth Busse

Date 12-17-91 Accepted ✓ Rejected N/A
By _____ UT Level III

nes NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD, DANBURY, CONNECTICUT 06810, (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

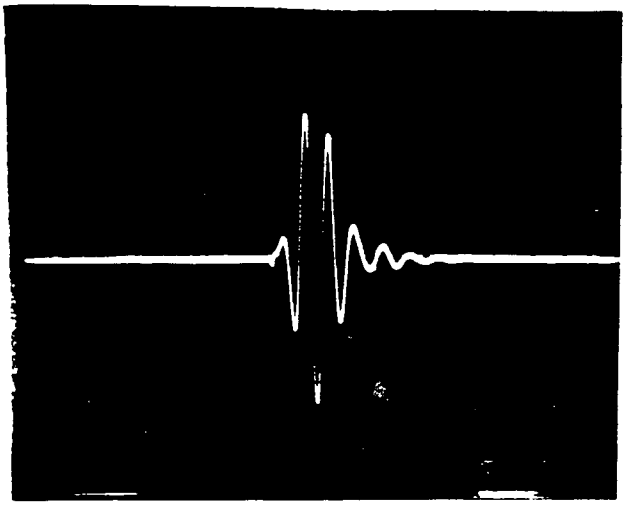
Report No. 965129l

SEARCH UNIT DATA

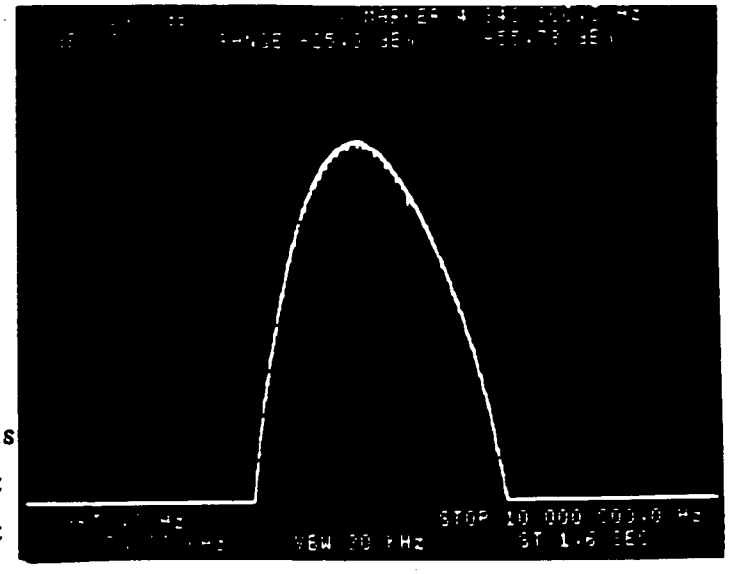
Manufacturer Aerotech
Serial No. K08505
Mfgr. Designation MSWS
Nominal Angle N/A ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 5.0MHz
Element Dimensions .25"Dia.
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector MICRODOT

REAL TIME WAVEFORM

.5 uS/Div. .5 Volts/Div.



SPECTRUM ANALYSIS



TEST DATA

Test Block S/N N/A
Block Material Lucite
Block Dimension Used 1.0"
Cable Type RG174/U Length 6'
Pulser/Receiver:
Gain 40 Energy 3
Receiver Attenuation 26 db
Receiver Damping 200 Ohms
3 db Limits: Lower 4.02 MHz
Upper 5.71 MHz
Center Freq. 4.865 MHz
6 db Limits: Lower 3.74 MHz
Upper 6.17 MHz
Measured Peak Freq. 4.84 MHz
Bandwidth 2.43 MHz
Measured Angle N/A ° in N/A

REMARKS

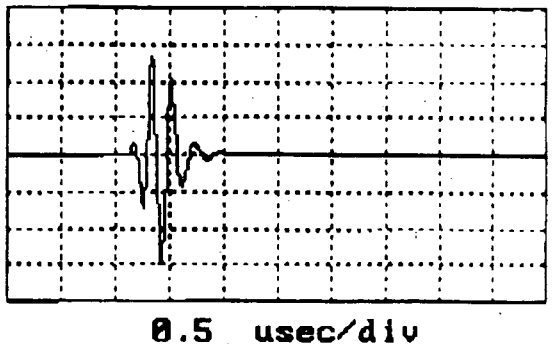
Certification Performed By:
Kenneth Brien
Date 12-17-91 Accepted ✓ Rejected ___
By [signature] UT Level III

Aerotech

CP+L

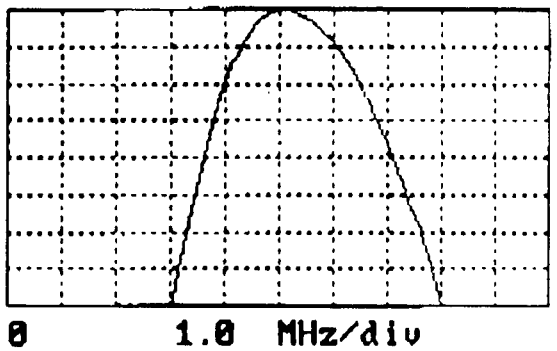
Transducer Certification

DATE: 10-23-1989
MODEL 113-224-580
SERIES: GAMMA STYLE: MSWS
SERIAL #K18989
DIAMETER: .25 in. CONNECTOR: MD
NOMINAL FREQUENCY: 5 MHz



TEST SETUP--
TEST BLOCK THICKNESS: 0.250 MATERIAL: PLEX
ENERGY SETTING: 2
IMPEDANCE SETTING: 50 OHMS

:T DATA--
PEAK FREQUENCY: 5.08 MHz
RELATIVE SENSITIVITY: 45 dB
INSPECTOR: B.BENNETT



EQUIPMENT USED:
UTA-4 (S/N 103 CAL THRU 10-90)
TEK 2430 SCOPE (S/N B012909 CAL THRU 10-90)
TEK PEP301 CONTROLLER
PROCEDURE: WAVEFORM SHOWN IS THE FIRST RETURN ECHO FROM THE INDICATED TARGET

THE ACCURACY OF THE INSTRUMENT DESCRIBED ABOVE HAS BEEN CONFIRMED BY FACTORY STANDARD TEST EQUIPMENT AND LABORATORY REFERENCE STANDARDS TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS.

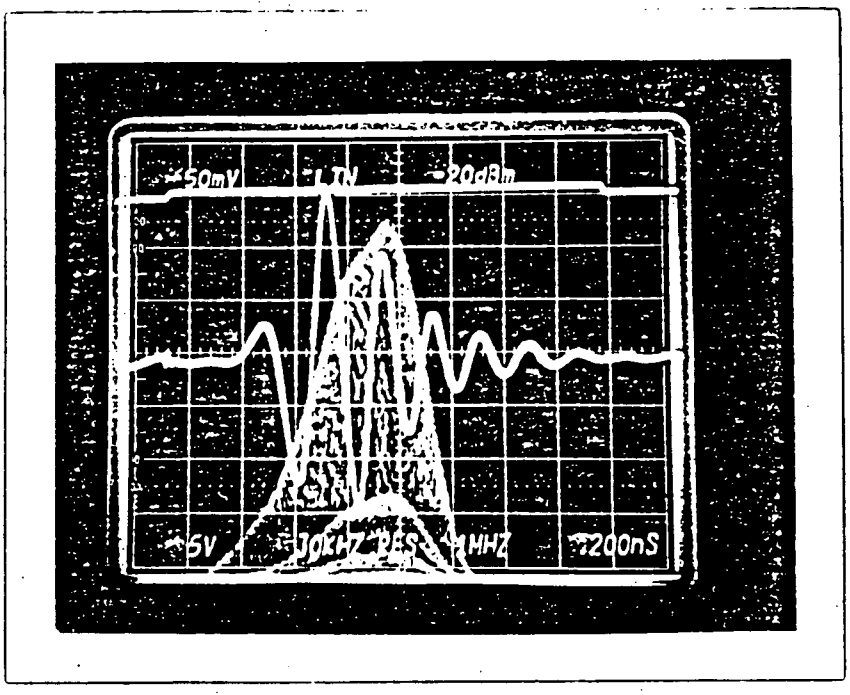
Krautkramer Branson
P.O. Box 350, Lewistown, PA 17044
(717) 242-0327 Fax: 717-242-2606

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: KB AEROTECH S/N KB11403

MARKED FREQUENCY: 5.0 MHz SIZE .375 in.



RESULTS

Central Scale 5 MHz (1 MHz/Division)

Transducer Central Frequency 4.45 MHz

X Acceptable

_____ Unacceptable

Interpretation By M. Stamm 1/20/81 Date

SHELTER ROCK ROAD, DANBURY, CT 06810 (203) 748-3581

CP+L

TRANSDUCER CERTIFICATION

Transducer Description

ies ALPHA S/N L04260

Frequency .75 MHz Size 1.0"

Style SWS Connector BNC

☑ Contact ☐ Immersion ☑ Nonfocused

Water Path NA ☐ Spherical

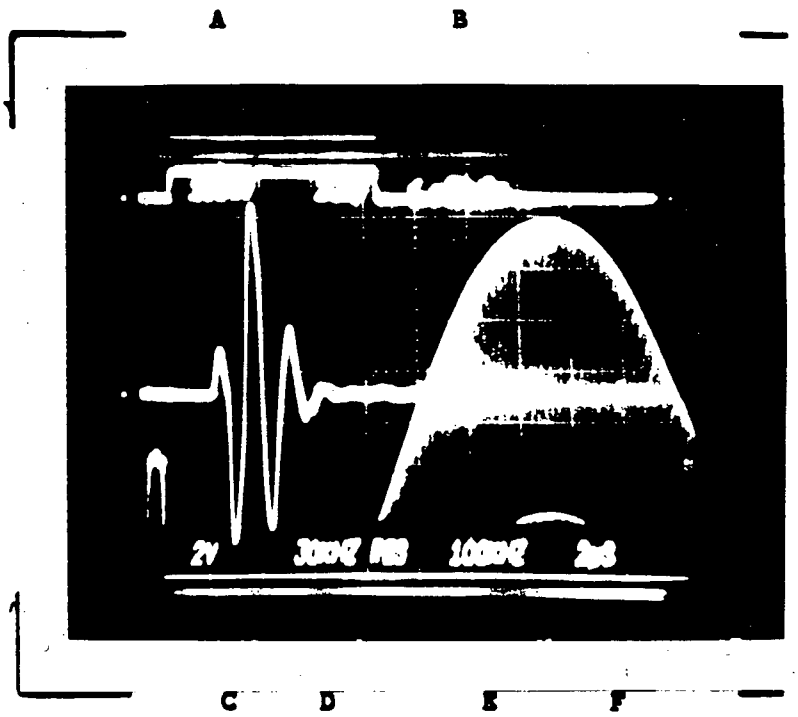
Target 1.0" PLEX ☐ Cylindrical

Relative Sensitivity 46 dB

Energy Setting 4 Impedance 250Ω

☑ Peak or ☐ Center Frequency .75 MHz

Inspector JTM Date 11/12/82



Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector lected with respect to transducer type. All contact (wearplate) transducers are tested on a at steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate using a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

Using an AEROTECH Ultrasonic Transducer Analyzer, Model UTA-4, and a Tektronix 7L12 frequency spectrum analyzer in a 7704A Mainframe, the real time waveform, UTA-4 gate signal, and the frequency spectrum of the gated signal are simultaneously displayed and photographed. Using the linear attenuator in the UTA-4 receiver, the amplitude of the real time waveform is adjusted to a six centimeter amplitude (± 1 dB) on the CRT. With the vertical calibration of Trace II fixed at 100 millivolts per division, the amount of attenuation used provides a relative sensitivity rating for all transducers certified by Krautkramer Branson.

Real Time Waveform - Trace II

Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for Trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

equency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B an D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

CP+L

TRANSDUCER CERTIFICATION

Transducer Description

as ALPHA S/N L04261

Frequency .75 MHz Size 1.0"

Style SWS Connector BNC

☑ Contact ☐ Immersion ☑ Nonfocused

Water Path NA ☐ Spherical

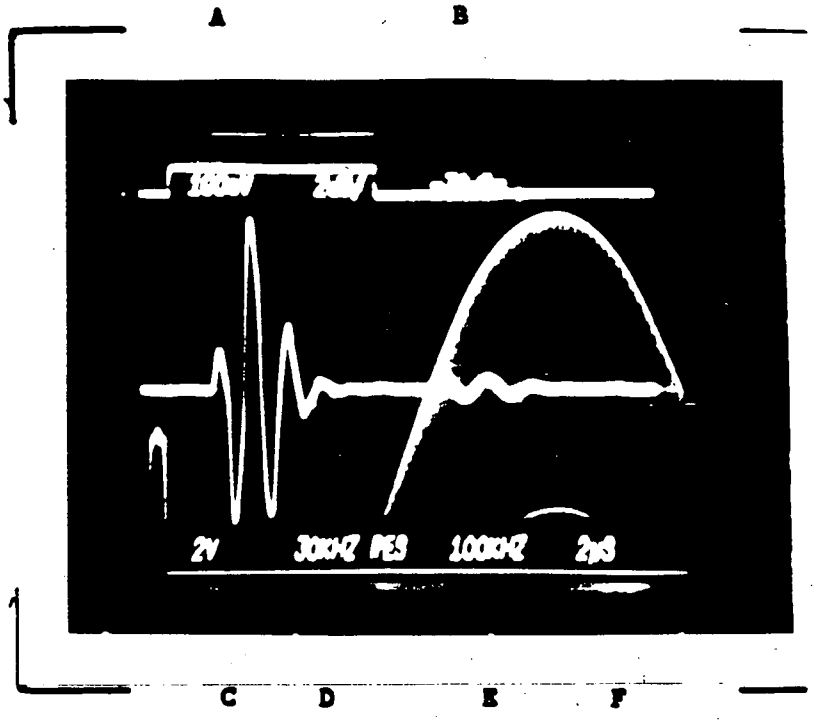
Target 1.0" PLEX ☐ Cylindrical

Relative Sensitivity 47 dB

Energy Setting 4 Impedance 250Ω

☑ Peak or ☐ Center Frequency .77 MHz

Inspector JTM Date 11/12/92



Testing Procedure

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quency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B and D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

Transducer Description

Series GAMMA

Frequency 2.25 MHz Size .25"

Serial No. L29324

[X] Contact [ ] Immersion [ ] Nonfocused
Water Path [ ] Spherical
_____ [ ] Cylindrical

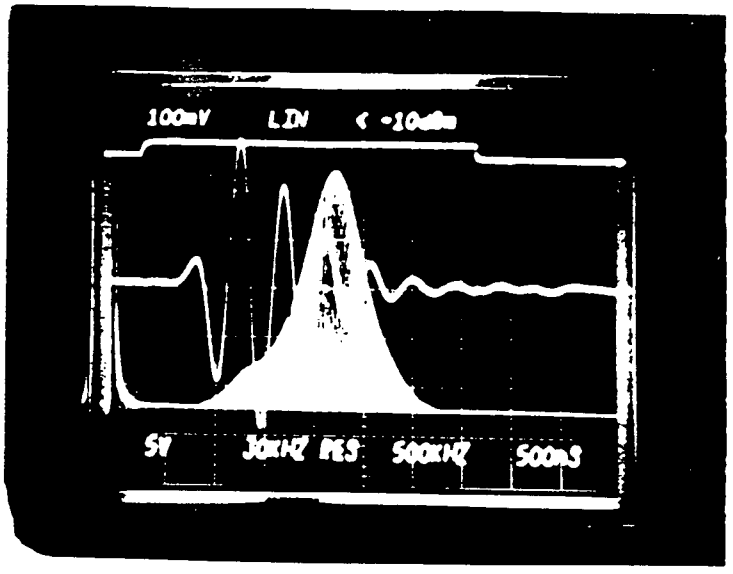
Style DUFP Connector BNC

Relative Sensitivity 12 DB

Energy Setting 2 Impedance 250Ω

Inspector JEF Date 3-7-84

A B



TRACE I

TRACE II

TRACE III

C D E F

Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a 1.0" flat steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate using a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

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Real Time Waveform - Trace II

Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for trace I is the same as that for trace II. The portion of trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

Frequency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for trace III. Figures B and D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

TRANSDUCER CERTIFICATION

Transducer Description

Series GAMMA HP S/N M12411

Frequency 5.0 MHz Size .50

Style F Connector MD

☑ Contact ☐ Immersion ☐ Nonfocused

Water Path DA ☐ Spherical

Target 3.0" STEEL ☐ Cylindrical

Relative Sensitivity 63 dB

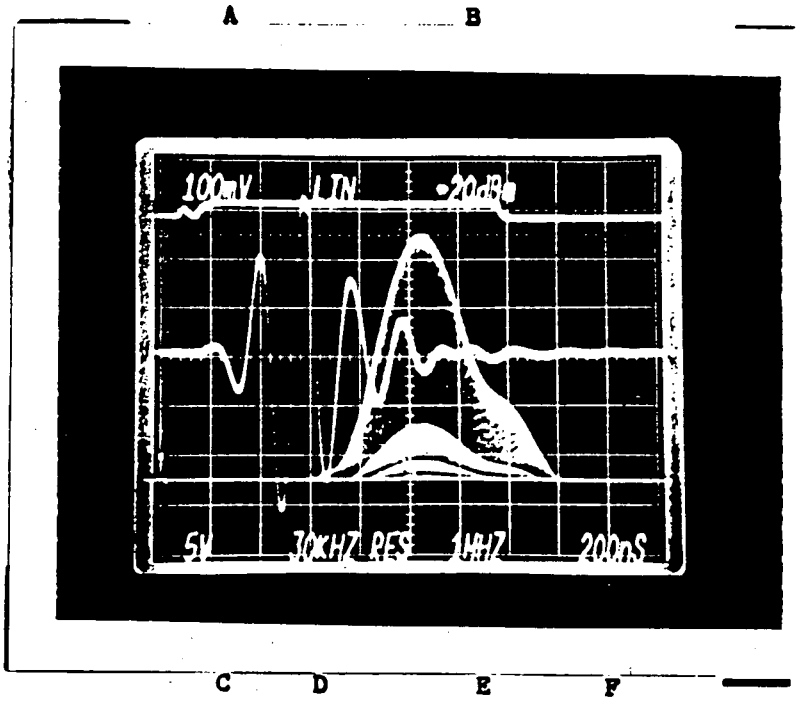
Energy Setting 4 Impedance 250

☑ Peak or ☐ Center Frequency 5.3 MHz

Inspector SAO Date 2-24-86

REVIEWED BY G.T. Rumsey LEVEL III 3-3-86

NUCLEAR ENERGY SERVICES



Testing Procedure

The real time waveform shown in the photo above is the first return echo from a reflector selected with respect to transducer type. All contact (wearplate) transducers are tested on a steel (4340) plate while epoxy-faced shear wave transducers are tested on a flat polymer block. Dual contact transducers are tested on a flat polymer block unless otherwise specified. Delay fingertip removable (Style DFR) transducers are tested off of the tip of the delay line. Nonfocused immersion transducers are tested in water over a flat steel plate using a water path as specified above. Focused immersion transducers are tested the same as nonfocused transducers except that the water path used is equal to the actual focal length.

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Screen writing figures A and F provide the vertical and horizontal screen calibration respectively for Trace II.

Gate Marker - Trace I

Screen writing figure C provides the vertical amplitude of the gate marker and is an inconsequential figure. The horizontal calibration for Trace I is the same as that for Trace II. The portion of Trace II that falls within the gate time period is the signal fed to the frequency spectrum analyzer.

Frequency Spectrum - Trace III

Screen writing figure E provides the horizontal calibration for Trace III. Figures B and D show the spectrum analyzer's attenuator and resolution settings respectively.

KRAUTKRAMER BRANSON
P. O. Box 350
Lewistown, PA 17044

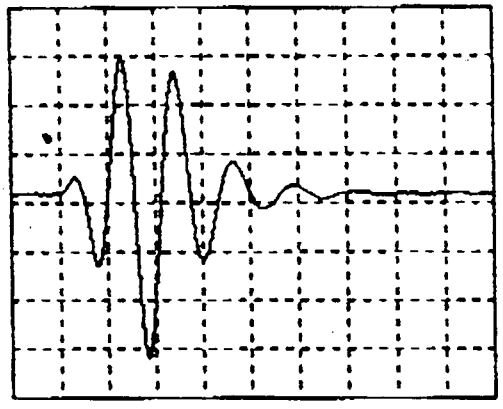
CP+L

AEROTECH

TRANSDUCER CERTIFICATION

DATE: 10-07-1993
MODEL 113-242-580
SERIAL m14135
SERIES: MSWS STYLE: GAMMA
ELE. SIZE: .500
NOMINAL FREQUENCY: 2.2 MHz

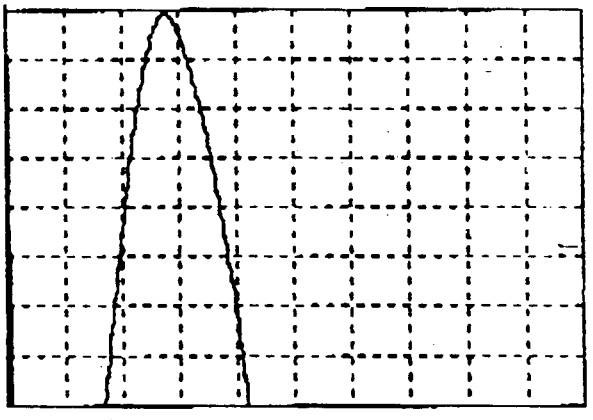
Test Setup--
Test Block : 1.0" PLEXI GLASS
Energy Setting: 2
Impedance Setting: 50 ohms



Test Data--

Peak Frequency: 2.0375 MHz
Relative Sensitivity: 34 db
Inspector: bp

Equipment Used:
UTA-4: SN 0233
UTA-4 Cal Due Date: 02/10/94
O-Scope SN:B022065
Cal Due Date:10/26/93
Software: FNT-0040 Rev. C



Procedure: Waveform shown is the first Return Echo from the indicated target.

The accuracy of the instrument described above has been confirmed by factory standard test equipment and laboratory reference standards traceable to the National Institute of Standards and Technology. This facility's Quality System is registered to ISO 9001 - ANSI/ASQC Q91. AT&T QR Certificate No. 930101

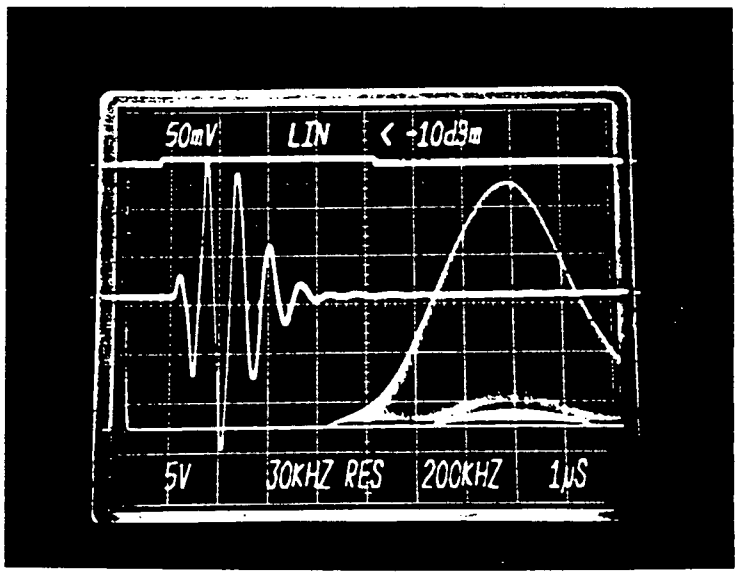
Krautkramer Branson
P.O. Box 350, Lewistown, PA; 17044
(717)242-0327 Fax:(717)242-2606

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Aerotech S/N M15116

MARKED FREQUENCY: 1.5 MHz SIZE .50



RESULTS

Central Scale 1.0 MHz (.2 MHz/Division)

Transducer Central Frequency 1.56 MHz

X Acceptable

_____ Unacceptable

Interpretation By M. Stamm 1/13/88
M. Stamm Date

SHELTER ROCK ROAD, DANBURY, CT 06810 (203) 748-3581

NES NUCLEAR ENERGY SERVICES SHELTER ROCK ROAD. DANBURY. CONNECTICUT 06810. (203) 796-5000

ULTRASONIC SEARCH UNIT QUALIFICATION

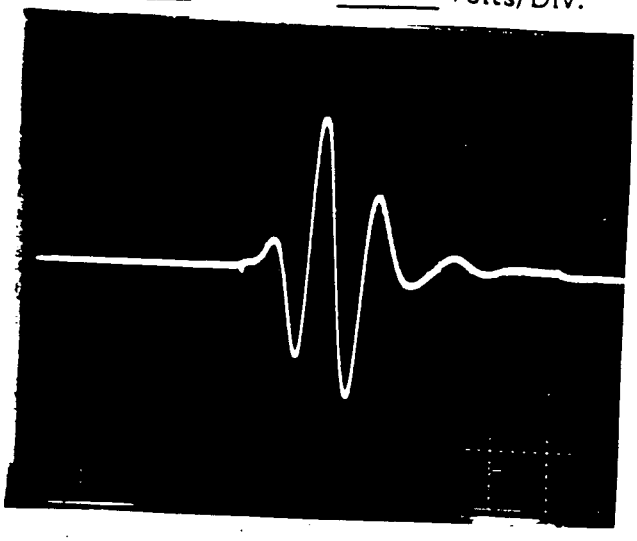
Report No. 9721291

SEARCH UNIT DATA

Manufacturer Aerotech
Serial No. M20226
Mfgr. Designation GAMMA
Nominal Angle N/A ° (Check One)
✓ Long. ___ Shear
Nominal Frequency 2.25MHz
Element Dimensions .5 x 1.0
Tuning: (Check One)
✓ Tuned ___ Untuned
Intended Use: (Check One)
✓ Contact ___ Immersion ___ Other
Connector BNC

REAL TIME WAVEFORM

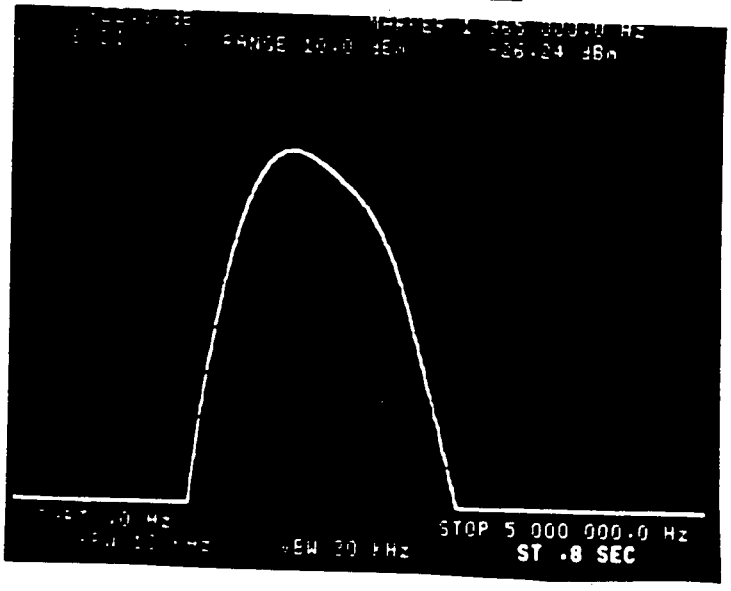
.5 uS/Div. .5 Volts/Div.



TEST DATA

Test Block S/N N/A
Block Material Lucite
Block Dimension Used 1.0"
Cable Type RG58A/U Length 6'
Pulser/Receiver:
Gain 40 Energy 3
Receiver Attenuation 34 db
Receiver Damping 50 Ohms
3 db Limits: Lower 1.595 MHz
Upper 2.56 MHz
Center Freq. 2.0775 MHz
6 db Limits: Lower 1.47 MHz
Upper 2.77 MHz
Measured Peak Freq. 1.965 MHz
Bandwidth 1.30 MHz
Measured Angle N/A ° in N/A

SPECTRUM ANALYSIS



REMARKS

Certification Performed By:
Kenneth Bries

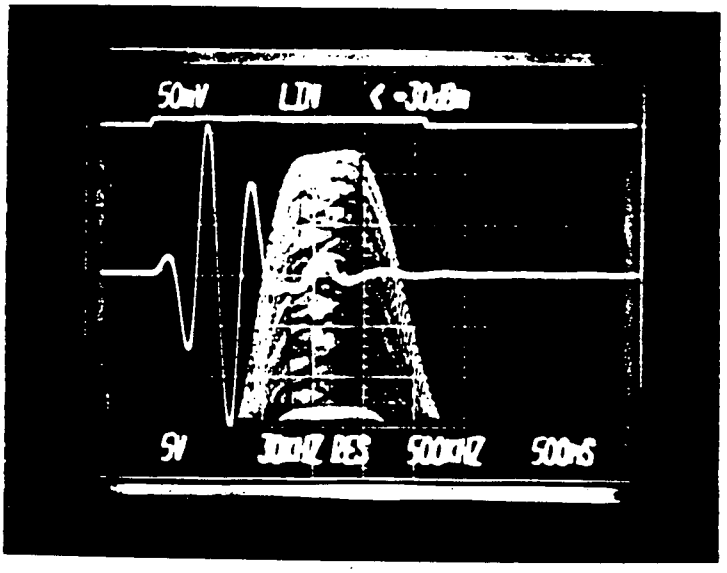
Date 12-18-91 Accepted ✓ Rejected N/A
By [signature] UT Level III

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: K. B. AEROTECH S/N M20225

MARKED NOMINAL FREQUENCY: 2.25 SIZE .5 x 1.0



RESULTS

HORIZONTAL SCALE 5 MHz (.5 MHz/DIVISION)

TRANSDUCER CENTRAL FREQUENCY 2.18 MHz

X ACCEPTABLE

_____ UNACCEPTABLE

INTERPRETATION BY R. T. Foote DATE 6/1/83

R. S. L. Foote, Level III

SHELTER ROCK ROAD, DANBURY, CT 06810
WRITER'S DIRECT DIALING NO.

(203) 796-5000
(203) 796-____

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Harisonic S/N W11025

MARKED NOMINAL FREQUENCY: 60MHz SIZE .325" de-focused
70° Fwd.

Illustrations Attached

RESULTS

HORIZONTAL SCALE 10 MHz (1 MHz/DIVISION)

TRANSDUCER CENTRAL FREQUENCY 7.4 MHz

✓ ACCEPTABLE

_____ UNACCEPTABLE

INTERPRETATION BY [signature] DATE 12-1-83

SHELTER ROCK ROAD, DANBURY, CT 06810
WRITER'S DIRECT DIALING NO.

(203) 796-5000
(203) 796-____

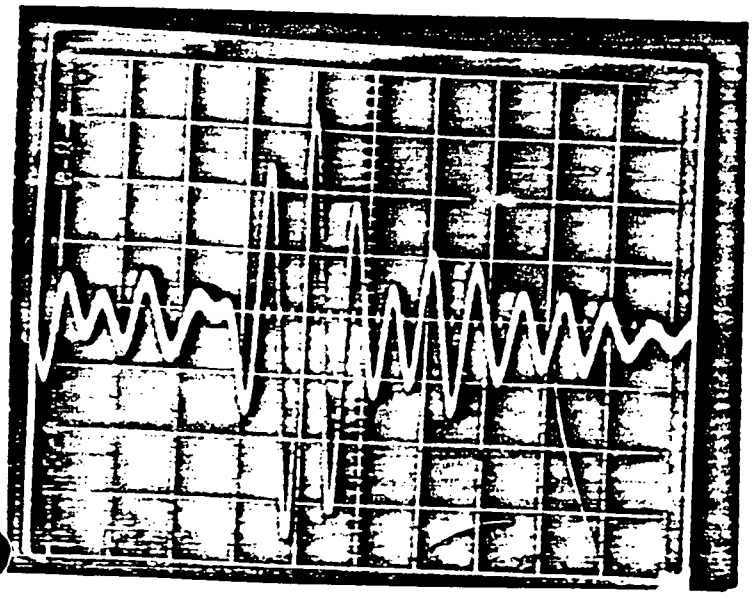
harisonic
HARISONIC LABORATORIES, INC.

7 Hyde Street
Stamford, Conn. 06907
Tel: (203) 324-3301

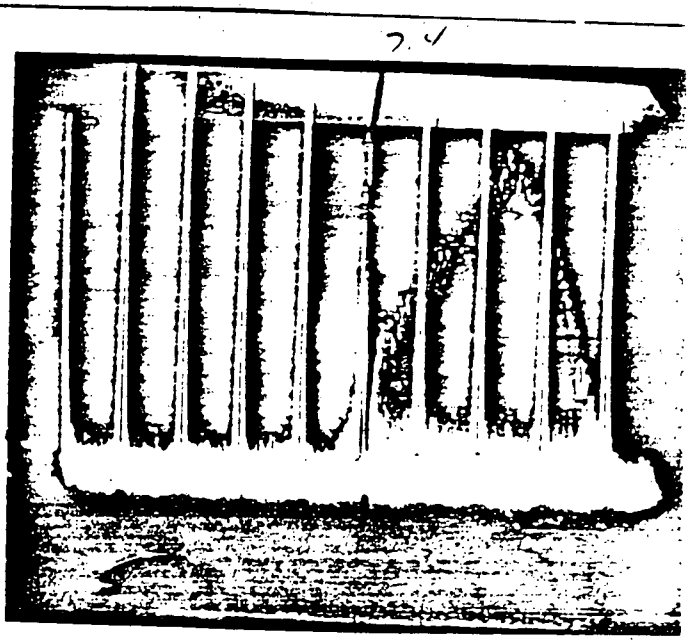
S/N W11025

Pulser: Panametrics Model 5052UA
50 ohm termination Energy level 3.
.005v/div. .2usec/div.

Markers @ 1 MHz intervals



70 deg. FWD
.5 mv/div.



Spectrum

NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Harisonic S/N W11025

MARKED NOMINAL FREQUENCY: 6.0MHz SIZE .325" de-focused
70° BKw.

Illustrations Attached

RESULTS

HORIZONTAL SCALE 10 MHz (1 MHz/DIVISION)

TRANSDUCER CENTRAL FREQUENCY 7.0 MHz

✓ ACCEPTABLE

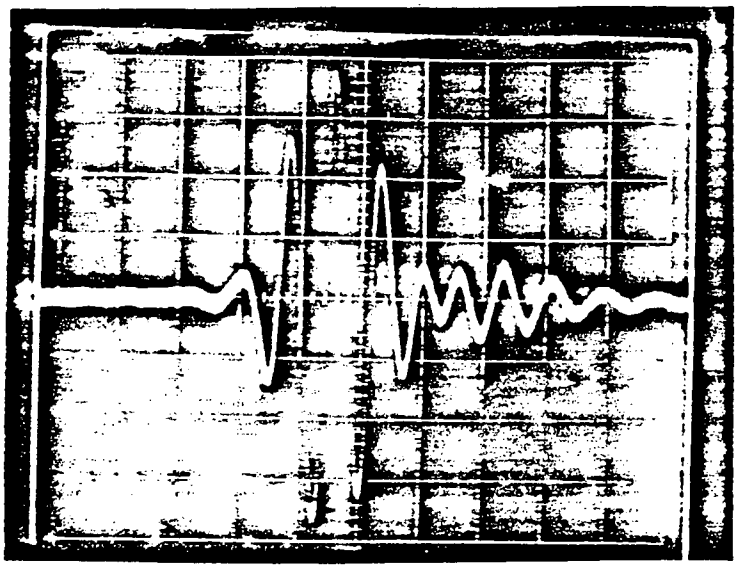
_____ UNACCEPTABLE

INTERPRETATION BY Peter P. Cuyler L III DATE 12-1-83

SHELTER ROCK ROAD, DANBURY, CT 06810
WRITER'S DIRECT DIALING NO.

(203) 796-5000
(203) 796-____

S/N W11025



70 deg. BKW

Spectrum

NES
NUCLEAR
ENERGY
SERVICES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Harisonic S/N W11025

MARKED NOMINAL FREQUENCY: 5.0 MHz SIZE 1/4" x 1/4"

90° Fwd.

Illustrations Attached

RESULTS

HORIZONTAL SCALE 10 MHz (1 MHz/DIVISION)

TRANSDUCER CENTRAL FREQUENCY 4.5 MHz

✓ ACCEPTABLE

______ UNACCEPTABLE

INTERPRETATION BY [signature] DATE 12-1-83

SHELTER ROCK ROAD, DANBURY, CT 06810 (203) 796-5000
WRITER'S DIRECT DIALING NO. (203) 796-_____

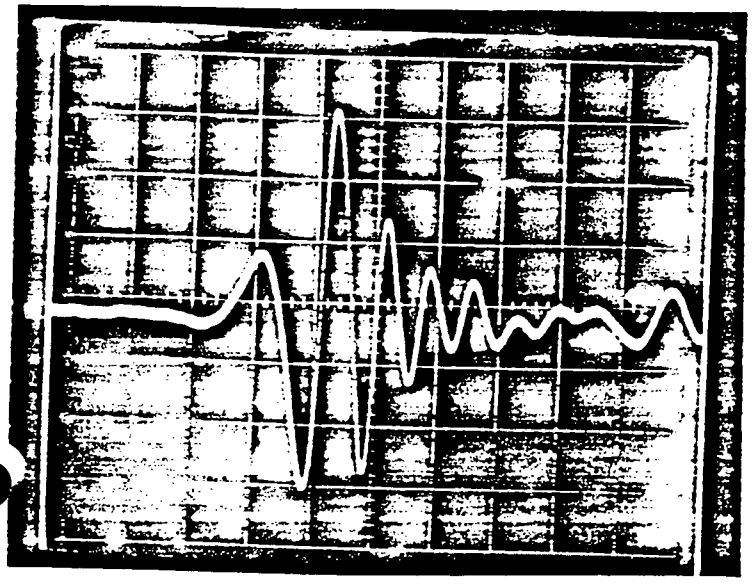
harisonic
HARISONIC LABORATORIES, INC.

7 Hyde Street
Stamford, Conn. 06907
Tel: (203) 324-3301

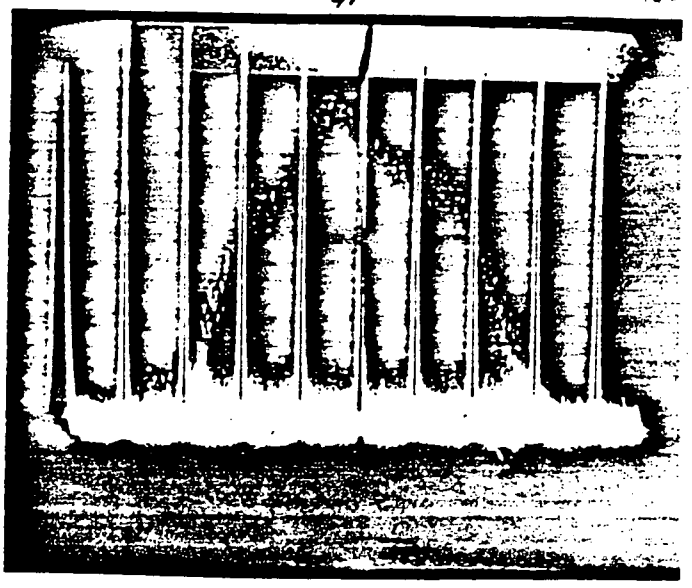
S/N W11025

Pulser: Panametrics Model 5052UA
50 ohm termination Energy level 3
.005v/div. .2usec/div.

Markers @ 1 MHz intervals



90 deg. FWD



Spectrum

Block ID	CP&L Part No.	Size/Schedule	Material Spec	HeatNo.	Comp/Sys
CPL/24	715-035-69	4" S/160	A-376 316	M9290	Pipe
CPL/31	715-918-12	10" S/120	A-312 304	6-448	Pipe
CPL/34	715-035-51	12" S/140	A-312 304	F0959	Surge
CPL/35	715-917-96	14" S/40	A-358 316	14085	Pipe
CPL/36	718-038-86	14" S/140	A-312 304	1762	Pipe
CPL/40	715-918-61	32" 1.203"	SA-516 GR	70802N67160	Pipe
CPL/44	718-177-53	5.0" T"	SA-533	D8366-5	Press.
CPL/45	718-177-61	3 1/2""T"	A-508	123P118	F/W Nozz.
CPL/47	726-997-9	8" "T"	SA-533	D8366-5	RV Head
CPL/48	726-998-46	8" S/160	A-106	50465	M/S Nozz.
CPL/51	726-997-54	5.0" "T"	A-508	122P169	S/Gs
CPL/56	726-998-79	26" 1.042"	A-155	3G6735	M/S
CPL/57	726-998-87	18" S/100	SA-508	128097	F/W
CPL/54	726-999-11	16" S/100	A-106	82565	F/W
CPL/50a	726-999-37	3 1/2""T"	A-533	D8366	S/Gs
CPL/58	731-689-32	8" S/160	A-376	316M0035	Pipe
CPL/59	731-688-82	10" S/160	SA-376 316	2543-4-1	Pipe
CPL/62	735-701-11	3.30"DIA.	SA-540	SPARE	RCP Stud
CPL/63	737-412-33	IRREGULAR	SA-508	6-5858	F/W I.R.
CPL/64	737-413-65	IRREGULAR	SA-508	31-3212	M/S I.R.
CPL/65	739-858-55	6"SCH 10	S/S	81547	Pipe
CPL/66	739-858-89	6"SCH 40	S/S	90190	Pipe
CPL/67	739-858-97	8"SCH 10	S/S	A030501	Pipe
CPL/65A	738-546-06	31"2.6" T	SA-376	K2980	Wroght SS
CPL/66A	738-545-98	31" 3" T	SA-351	5160C-1	Cast EL
ACCUM 1		2"	A182		Fitting
ACCUM 2		1"	A182		Fitting
ACCUM 3		3/4"	A182		Fitting
BSEP 2P4518		3" SCH 80	SA-312 304	2P4518	Pipe
UT 8 TURKEY POINT BLOCK		5.5"T	SA-216 WCC	5.5-CSCL-8-TKY	Spray IR

NES, INC.

September 4, 1993

H. B. ROBINSON 1993 OUTAGE
IIW/ROMPAS BLOCK INVENTORY

SERIAL NO.

86-3253 (SS)

86-3254 (SS)

794861 (SS)

6086-83 (CS)

6088-83 (CS)

1035-83 (CS IIW)

DETEK, INC. · 6805 COOLRIDGE DR. · TEMPLE HILLS, MARYLAND 20748
NONDESTRUCTIVE TESTING EQUIPMENT
TEL. (301) 449-7300 · TELEX: 89-2517

CERTIFICATION OF COMPLIANCE
ULTRASONIC TEST BLOCK

CUSTOMER Nuclear Energy Services

c/o Carolina Power & Light
Shearon Harris Nuclear Plant
State Road 1134
New Hill, N.C. 27562

PURCHASE ORDER #

DATE March 9, 1983

ITEM	TEST BLOCK	S/N	MATERIAL	SPECIFICATION
1	IIW Type I	1035-83	Steel	AWS D1.1-81

The above test block (s) have been certified by the manufacturer to have been manufactured in accordance with applicable specifications and have been inspected and found to be dimensionally accurate using measuring equipment traceable to the National Bureau of Standards.

RAY - CHECK MANUFACTURING INC.

RCM / Omni Tool

Ultrasonic Reference Blocks

Telephone (209) 299-6834
P.O. Box 8
Clovis, CA 93613

Precision Products

CERTIFICATE OF COMPLIANCE
ULTRASONIC TEST BLOCK

CUSTOMER J.M. DEVINE CO.

73 NORMANDY DR.

CRANSTON, RHODE ISLAND

DATE 8/16/83

PURCHASE ORDER NO. 3738

ITEM	TEST BLOCK	SER. NO.	MATERIAL	SPEC.
1	ANGLE BEAM	6081-83	A 36 Steel	
	" "	6082-83	A 36 Steel	
	" "	6083-83	A 36 Steel	
	" "	6084-83	A 36 Steel	
	" "	6085-83	A 36 Steel	
	" "	6086-83	A 36 Steel	
	" "	6087-83	A 36 Steel	
	" "	6088-83	A 36 Steel	
	" "	6089-83	A 36 Steel	
	" "	6090-83	A 36 Steel	
2	ANGLE BEAM	6091-83	304 Stainless St.	
	" "	6092-83	304 Stainless St.	
	" "	6093-83	304 Stainless St.	
	" "	6094-83	304 Stainless St.	
	" "	6095-83	304 Stainless St.	
	" "	6096-83	304 Stainless St.	
	" "	6097-83	304 Stainless St.	
	" "	6098-83	304 Stainless St.	
	" "	6099-83	304 Stainless St.	
	" "	6100-83	304 Stainless St.	

These blocks have been manfactured in accordance with applicable specs. a inspected in accordance with MIL-I-45208A, with instruments calibrated in accordance with MIL-C-45662 and traceable to the National Bureau of Standards.

These blocks were found to be within dimensional tolerances specified.

Fred Hoffman

AUTOMATION / SPERRY
SHELTER ROCK ROAD
DANBURY, CONN. 06810-7095
(203) 796-5000 TELEX: 221970 AIND UR

CERTIFICATE OF COMPLIANCE

TO: Nuclear Energy Services
Danbury, CT.

DATE: May 21, 1985
P.O.#: N54575
AUTOMATION ORDER#: 11-4498-5

ITEM	QUANTITY	MODEL	DESCRIPTION	SERIAL
1	3	57A4248 304SST	Angle Beam Calibration Block	794859 794860 794861

These blocks are certified to have been manufactured in accordance with Automation Industries drawings and meet these specifications. Inspection has been performed with equipment traceable to the National Bureau of Standards.

Andrew Siebern

Andrew Siebern
Quality Assurance Manager

RAY · CHECK MANUFACTURING INC.

Telephone (209) 299-6834
P.O. BOX 8
Clovis, CA 93613

RCM TEST STANDARDS
ULTRASONIC REF. BLKS.
EDDY CURRENT, MAG. PARTICLE
RADIOGRAPHIC
EDM CAPABILITIES

P.O. # N60310

[redacted]

CERTIFICATE OF COMPLIANCE

CUSTOMER J. M. Devine Co.
49 Libera Street
Cranston, R.I. 02920

DATE 2/13/86

PURCHASE ORDER NO. 8998

TEST BLOCK	SER. NO.	MATERIAL	SPECIFICATION
Angle Beam	86-3252	304 Stainless Steel	Bur. of Public Roads
	86-3253	"	"
	86-3254	"	"
	86-3255	"	"

These blocks have been manufactured in accordance with applicable specs. are inspected in accordance with MIL-I-45208A. with instruments calibrated in accordance with MIL-STD-45662 and traceable to the National Bureau of Standards.

These block were found to be within dimensional tolerances specified. N.B.S. Certificate No. 79577-A; 74974-A

Fred Hoffman

RP

NUCLEAR

United States Steel Corporation

ELLWOOD, WORKS

METALLURGICAL DEPT.

STANDARD SWORN TEST REPORT
TUBULAR PRODUCTS

DATE 4/2/71

CUSTOMER: CAPITOL PIPE & STEEL PRODUCTS INC	CUSTOMER'S ORDER NUMBER: 58146 0011	INVOICE NO.: 42312	U.S. STEEL ORDER NO.: KC 27420
ADDRESS: PO BOX 471	MATERIAL: SMLS STAINLESS PRESSURE PIPE		GRADE: * SEE BELOW
CITY STATE: BALA CYNWYD, PA. 19004	HEAT TREATMENT:	SIZES: 3.500"OD X .300"AW	
SPECIFICATION OR PRODUCT DESCRIPTION: *ASTM A 312 AND ASME SA 312 - TP 304 & AS NOTED ON ORDER		3" sch 80	

HEAT NUMBER	CODE, ITEM OR LOT	CHEMICAL ANALYSIS (%) C	MN	P	S	SI	NI	CR	MO	HYDRO. TEST PRESSURE P.S.I.	MECHANICAL PROPERTIES: YIELD STRENGTH POINT P.S.I.	ULTIMATE STRENGTH P.S.I.	ELONG. IN 2" %	RED. OF A. OR HARDNESS	OTHER DATA
2P4328	LADLE	.045	1.52	.027	.015	.52	10.12	18.58		2500	46850	82480	63.0		
	CHECK	.055	1.48	.028	.014	.59	10.41	18.76							
	CHECK	.050	1.48	.028	.013	.59	10.41	18.76							
1-B 2P4518	LADLE	.049	1.50	.028	.023	.48	10.48	18.54		2500	58760	87140	57.0		
	CHECK	.051	1.49	.028	.024	.54	10.41	18.71							
	CHECK	.051	1.49	.028	.022	.58	10.41	18.71							

M. W. Kellogg Co. PO# 11-P564-10 Item# 70

FLATTENING TESTS SATISFACTORY

MATERIAL COVERED BY THIS DOCUMENT WAS HEAT TREATED BY HEATING IN A CONTINUOUS TYPE FURNACE CONTROLLED AT 2000 DEG. F. MINIMUM AND COOLING RAPIDLY BY MEANS OF A WATER SPRAY CURTAIN POSITIONED AT EXIT OF FURNACE

STATE OF PENNSYLVANIA)
COUNTY OF LAWRENCE) SS

Subscribed and sworn to before me this 2ND day of APRIL 19 71

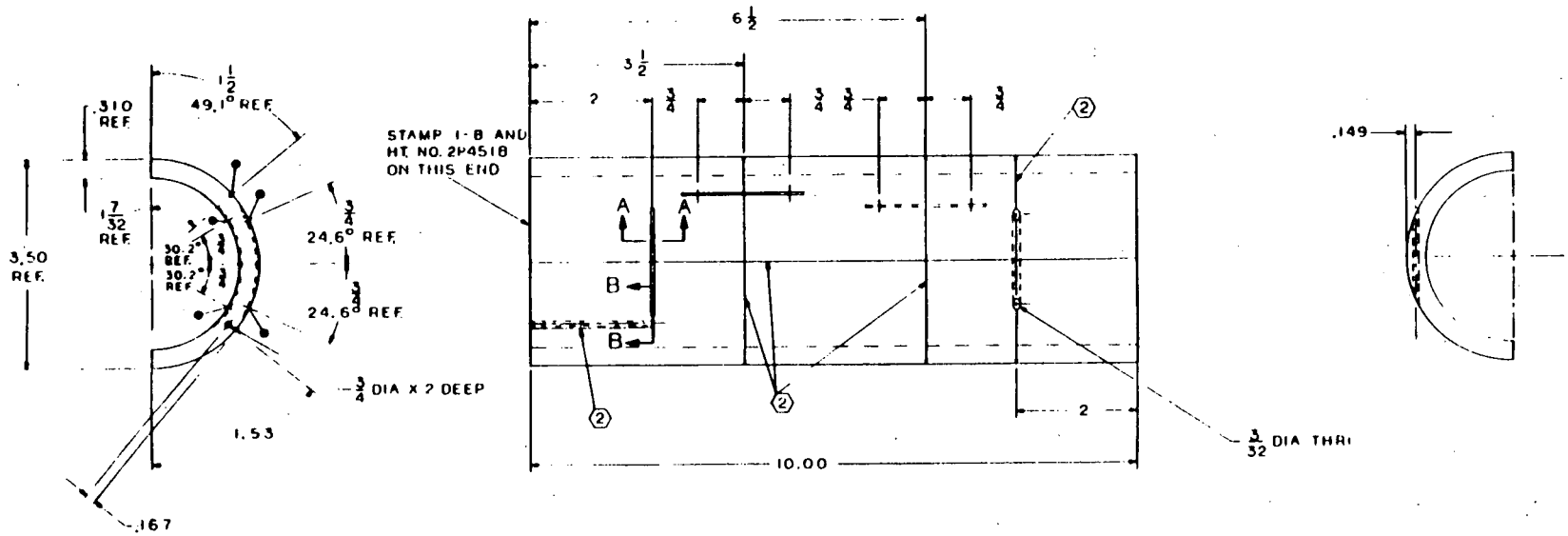
Notary Public

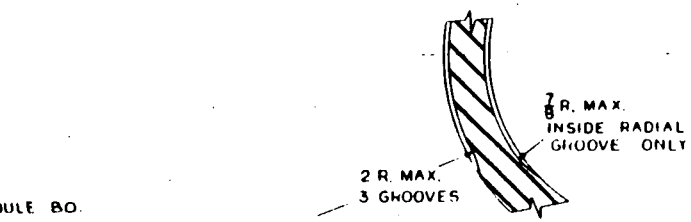
My Commission expires

M E SCHLENNER, being duly sworn according to law, deposes and says that the figures set forth above are correct, as contained in the records of the company.

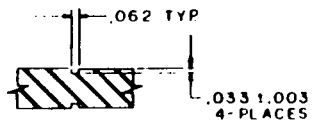
M E Schlenner
(SIGNATURE OF DEPONENT)

(DEPARTMENT HEAD)





SECTION B-B
SCALE 2/1



SECTION A-A
SCALE 2/1

NOTES:

1. PIPE SIZE 3" DIA SCHEDULE 80.
2. SCRIBE CENTERLINE .003 TO .005 WIDE AND DEEP WHERE NOTED. STEEL STAMP OR MILL CUT AN INDEX MARK AT ENDS OF EACH CENTERLINE AS SHOWN 1/32 X 1/32 X 1/4 LONG.
3. DIMENSIONS ARE AS-BUILT.
4. THIS DWG SUPERSEDES SWRI DWG D-2371-093 REV C.

1-B

	A. PEREZ	3" PIPE [illegible]	
		BRUNSWICK	D-23

CP&L
Carolina Power & Light Company
ROBINSON NUCLEAR PLANT
POST OFFICE BOX 790
HARTSVILLE, SOUTH CAROLINA 29551

Serial: RNP/93-2068

Mr. L. W. Pearce
Plant General Manager
Florida Power & Light
Turkey Point Station
Post Office Box 029100
Miami, Florida 33102-9100

RE: Calibration Block 5.5-CSCL-8-TKY

Dear Mr. Pearce:

Carolina Power & Light Company's H. B. Robinson Unit 2 is requesting the use of ultrasonic testing Calibration Block 5.5-CSCL-8-TKY from Florida Power and Light's Turkey Point Nuclear Station. Personnel from our staff have been discussing this loan with Mr. Michael Blew of your ISI staff.

It is understood that Carolina Power & Light Company will be responsible for the calibration block while it is in our possession, or should it be lost for some unforeseen reason during shipment.

Additionally, it is understood that prior to the block being shipped back to Florida Power and Light Company, the Health Physics personnel at Turkey Point will be notified so that they will be prepared to receive it.

This block is for use on the Pressurizer Spray Nozzle, as required by ASME Section XI, at H. B. Robinson Unit 2 during the upcoming refueling outage.

Thank you for your cooperation by loaning the use of this specialty piece of ISI equipment.

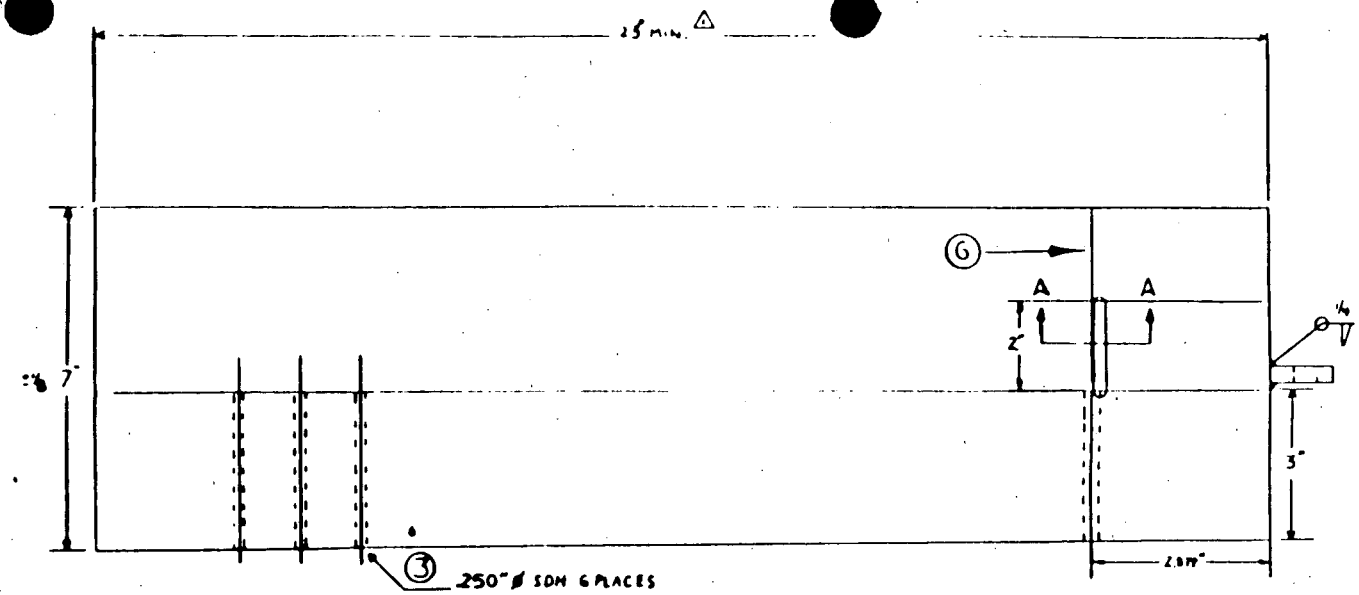
Very truly yours,

F. L. Lowery for

William J. Flanagan, Jr.
Acting Plant General Manager
Robinson Nuclear Plant

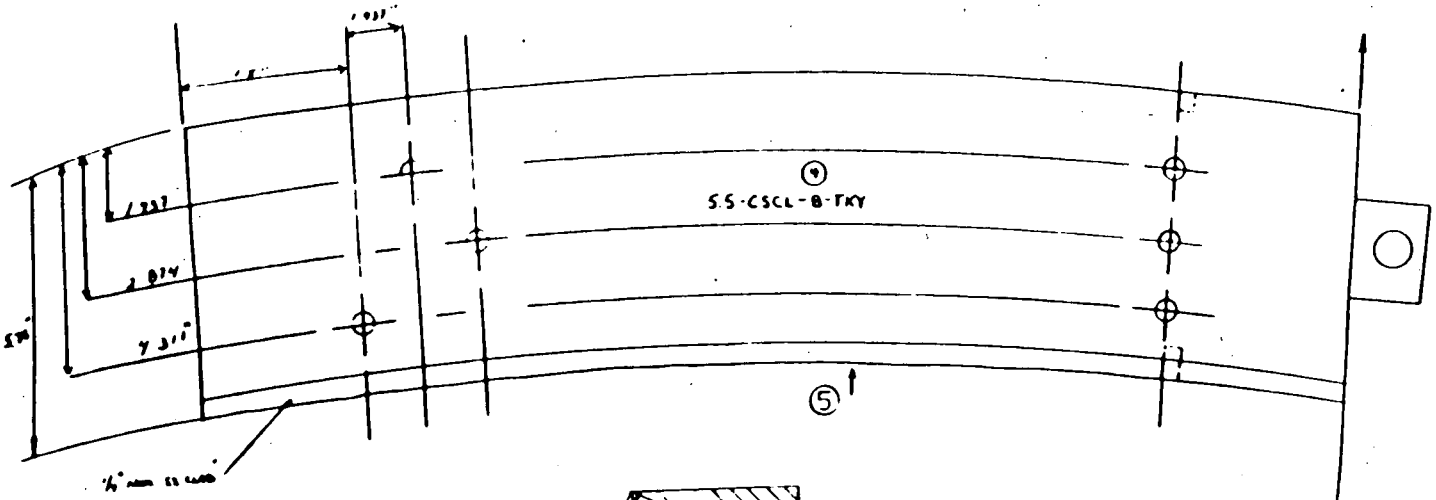
RDW:lst

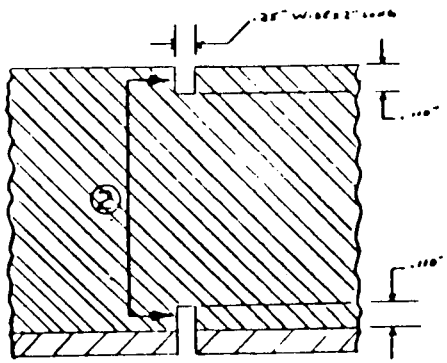
FAX'd 8/24/93 @9:34am



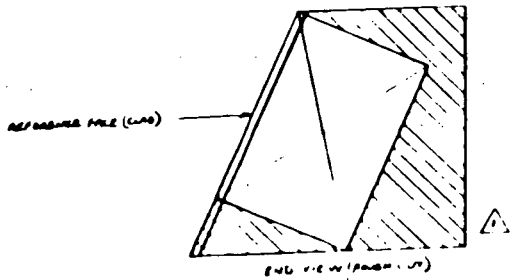
NOTES:

1) UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:
   HOLE LENGTH ±1/8" -0"
   HOLE DIAMETER ± 1/32"
   NOTCH DEPTH +5% -10%
2) NOTCH SIDES SHALL BE PERPENDICULAR TO ENTRY SURFACE WITH A FINISH OF 64 RMS OR BETTER
3) REAM ALL HOLES 64 RMS
4) STAMP FPL IDENT. WITH 1/4" HIGH LETTERS ON THIS FACE
5) LEAVE SURFACE "AS RECEIVED"
6) SCRIBELINE APPROX .005" DEEP
7) FABRICATED FROM 3 G. CHANNEL HEAD PROLONGATION
8) BREAK ALL CORNERS 1/64 APPROX. R





VIEW A-A



SCALE NONE

ASME SECTION V ARTICLE 4 1980 EDITION

REVISIONS	SYSTEM DESCRIPTION A 216 WCC
0	ULTRASONIC CALIBRATION BLOCK
1	FLORIDA POWER & LIGHT COMPANY 5.5-CSCL-8-TKY

DRAWN BY [illegible] DATE [illegible] SHEET 1 OF 1
CHECKED BY DATE
APPROVED BY DATE C-ISF007

FLORIDA POWER & LIGHT COMPANY

INTER-OFFICE CORRESPONDENCE

LOCATION PTP

DATE 11-15-82

TO FILE (5.5-CSCL-9-TKY)

FROM F.T. CARR, NDE ENGR.

COPIES TO CH-CSCL-9-TKY FILE

SUBJECT: CALIBRATION BLOCK MATERIAL ORIGN

AS A PART OF THE UNIT-3 STEAM GENERATOR REPLACEMENT PROGRAM, THE CHANNEL HEADS OF THE REPLACEMENT GENERATORS WERE CUT OFF AND SCRAPPED. TWO (2) PIECES OF THE CHANNEL HEAD MATERIAL WERE SALVAGED FROM THE CUT EDGE TO BE FABRICATED INTO CALIBRATION BLOCKS.

MESSRS. M. MOBRAY AND G. MCKENZIE OF FPL ENG. SUPERVISED THE CUTTING AND I SUPERVISED THE FINAL MACHINING OF THESE TWO BLOCKS. THEY WERE CUT FROM GENERATOR NO. 3003.

F.T. Carr

FSGT 3003

5.5-CSCC-8-TKY

QUANTITY	DESCRIPTION	TEST NUMBER
1	Channel Head Casting	TO7255
1	Center Drain Tube	TO7342-6
1	Coupling	TO8361-3
1	Partition Plate	TO7293
1	Manway Inzert "Z"	TO7926-23
1	Manway Insert "W"	TO7926-24
1	Manway Cover "Z"	TO7941-17
1	Manway Cover "W"	TO7941-9
32	Manway Cover Bolts	TO8368, TO7834
1	Closure Ring "U"	TO7765-7
1	Closure Ring "V"	TO7765-8
1	Tube Plate	TO6656
1	Partition Stub	TO6419-3
1	Boss (1.00) Shell Drain	TO5374
1	Boss (2.50)	107183
1	Stub Barrel	TO6526-1
1	Boss (.75) Level Indicator	TO6753-17
1	Inspection Opening Cover (3.00)	TO7922
8	Inspection Opening Cover Bolts	TO6816
1	Handhole Cover (6.00)	TO7920-220
1	Handhole Cover (6.00)	TO7920-221
1	Handhole Cover (6.00)	TO7920-222
1	Handhole Cover (6.00)	TO7920-223
1	Handhole Cover (6.00)	TO7235-13
1	Handhole Cover (6.00)	TO3362-1
48	Handhole Cover Bolts	TO8658
		TO8136
1	Lower Shell Barrel "A"	TO6522
1	Lower Shell Barrel "B"	TO6752
1	Trunnion "W"	TO6296
1	Trunnion "Y"	TO6296
1	Transition Cone (Seg. 1)	TO6713-2
1	Transition Cone (Seg. 2)	TO7205-2
1	Transition Cone (Seg. 3)	TO7205-1
3214	U-Tubes	TO8286
	Tube Plugs	TO5269-1,2,3,
		TO7752

Certification No. TRC-062
Date 9/8/1978
Page 4 of 127

APPENDIX B, REV. 1

CHECK LIST FOR SA216 GRADE WCC

Identification:

(A) Description — See attached Identification Mark printed matter.
(B) P.O. Number — 545-5743-F259
(C) Supplier — Japan Casting and Forging Corporation
(D) Casting Number — Test No. 1NHE53
(E) ASME Material Specification — ASME SA216 Gr. WCC
(F) A-Drawing Number — 6524D18 CHG. 1

Heat Treatment - Casting:

(A) ~~Normalizing~~ Annealing
(1) Holding Time (Hours) — 15
(2) Holding Temperature (°F) — 1800
(3) Final Temperature (°F) — 554
(4) Mode of Cooling — Furnace Cooling
(5) Date Performed — Jul. 20~24, 1977

(B) If Second Normalize, repeat above N/A
(1) Holding Time (Hours) N/A
(2) Holding Temperature (°F) N/A
(3) Final Temperature (°F) N/A Not Applicable
(4) Mode of Cooling N/A
(5) Date Performed N/A

(C) Austentitizing and Quenching
(1) Holding Time (Hours) — 10
(2) Holding Temperature (°F) — 1670
(3) Final Temperature (°F) — 230
(4) Mode of Quenching — Water Cooling
(5) Date Performed — Jul. 31~Aug. 1, 1977

(D) Tempering

(1) Holding Time (Hours) — 15
(2) Holding Temperature (°F) — 1220
(3) Mode of Cooling — FURNACE COOLING
(4) Date Performed — Aug. 1 ~ 5, 1977

(E) Stress Relieve

	(1ST.)	(2ND.)
(1) Holding Time (Hours)	10	5
(2) Holding Temperature (°F)	1130	1130
(3) Mode of Cooling	FURNACE COOLING	
(4) Date Performed	Feb. 3 ~ 5, 1978	Feb. 23 ~ 25, 1978

Heat Treatment - Test Specimen:

Each set of specimens consist of one (1) bend, one (1) tensile, and three (3) Charpy.

	("X" COUPONS)	("Y" COUPONS)
(1) Furnace Charge Temperature (°F)	140	104
(2) Rate of Heating (°F/Hour)	104	104
(3) Holding Time (Hours)	48	63
(4) Holding Temperature (°F)	1.130	1.130
(5) Rate of Cooling (°F/Hour)	122	96
(6) Discharge Temperature (°F)	464	356
(7) Date Performed	8/10 ~ 8/13/1977	9/2 ~ 9/6/1977

Chemical Composition (%)	(LADLE)	(CHECK FOR "X" COUPONS)	(CHECK FOR "Y" COUPONS)
(1) Carbon	0.23	0.22	0.21
(2) Manganese	0.94	0.88	0.88
(3) Phosphorus	0.005	0.004	0.004
(4) Sulfur	0.004	0.003	0.004
(5) Silicon	0.42	0.40	0.40
(6) Copper	0.03	0.02	0.03
(7) Nickel	0.24	0.23	0.23
(8) Chromium	0.22	0.23	0.23
(9) Molybdenum	0.19	0.18	0.18
(10) Aluminum	0.018	0.021	0.011
(11) Titanium	0.0020	0.002	0.001
(12) Vanadium	0.005	0.004	0.004

Certification No. TRC-062
Date 3/1/1978
Page 6 of 127

Material Properties - Data:

(A) Projection - One value each except where noted ('X')

(1)	Tensile Strength (psi)	72,400
(2)	Yield Strength at 0.2% off set (psi)	44,900
(3)	Elongation in 2-inch (%)	30.5
(4)	Reduction in area (%)	66.9
(5)	Bend Test (90°)	Good
(6)	Three (3) Charpy Values (ft-lb)	80.3, 97.6, 78.1
(7)	Two (2) Drop Weight Tests	at +10°F No break

(B) Nozzle Prolongation - One value each except where noted ('Y')

(1)	Tensile Strength (psi)	76,300
(2)	Yield Strength at 0.2% off set (psi)	48,300
(3)	Elongation in 2-inch (%)	31.3
(4)	Reduction of Area (%)	66.9
(5)	One Bend Test (90°)	Good
(6)	Three (3) Charpy Values (ft-lb)	83.9, 88.2, 92.5
(7)	Two (2) Drop Weight Tests	at +10°F No break

Nondestructive Examination:

(A)	Radiographic Inspection	See attached sheet Page 18 ~ 72 of 127
(B)	Magnetic Particle Inspection	Page 73 of 127
(C)	Ultrasonic Inspection	Page 80 ~ 81 of 127

Repair Welds:

(A) Quantity - Location - Dimension of Cavity

(B) Cavity Photographs

See attached sheet Page 83 ~ 114 of 127

CASTING & FORGING CORPORATION

RESULT OF CHEMICAL ANALYSIS

(LADLE)

ustomer WESTINGHOUSE ELECTRIC CORPORATION/TAMPA
ustomer O. No. 545-5743-F259
ifg. Ord. No. CET0259A
est No. 1NHE53
eat No. 17436, 27256
ame of Article Coolant Channel Head Casting

Certification No. IRC-062
Date 3/8/1978
Page 7 of 127

. No. MTP-NC-1004 Rev. 0
Prod. Seq. No. 3

Sheet No. E53-CH-01
Date of Report July 4, 1977
Test Procedure -
Customer Material ASME SA216 Gr.WCC
Customer Spec.No. 398A006 Rev.10

Element / Requirement / Heat No.	C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu	Al	Ti	(%)			
	max. 0.25	max. 0.60	max. 1.20	max. 0.040	max. 0.045	max. 0.50	max. 0.40	max. 0.25	max. 0.03	max. 0.50	-	-				
17436	0.23	0.42	0.93	0.005	0.004	0.24	0.23	0.19	0.004	0.03	0.018	0.002				
27256	0.23	0.43	0.95	0.005	0.003	0.23	0.21	0.19	0.007	0.02	0.017	0.002				
Average	0.23	0.42	0.94	0.005	0.004	0.24	0.22	0.19	0.005	0.03	0.018	0.002				

ote

Melting Date : July 1, 1977
Melting Process : Electric Arc Furnace
Analysis Method : Photoelectric Emission Spectroscopic Analysis

We certify that the above tests have been performed in accordance with the order requirements and that the test results are true and accurate as reported.

(113)

R. Kawakatsu
for Manager of Quality ~~Control~~ Assurance

H. B. ROBINSON 1993 OUTAGE
MAGNETIC PARTICLE INVENTORY LIST

MFG.	SERIAL NO.	MODEL	BATCH NO.
PARKER	423	DA-400	N/A
PARKER	88-012 (CPL)	B-300	N/A
NES	SRO-MT-OO1	TEST WEIGHT	10.76 LBS
SPECTROLINE	810082	UV METER	N/A

5

CALIBRATION CERTIFICATE OF
MAGNETIC PARTICLE EXAMINATION EQUIPMENT

Agency performing the check: NES

Equipment Make Parker Model DA-400 S/N 423

Calibration Date 8-3-93 Next Cal. Due Date 8-3-94

Units with Ammeters:

Full Scale Reading _____ 10% of Full Scale: _____

Control Meter Make _____ Model _____ S/N _____

Next Cal. Due Date _____

Is documentation available showing traceability to NBS? Yes ___ No ___

AMMETER READINGS

	Control Meter	Unit Meter	Difference	Adjusted	Difference
1.					
2.					
3.					
4.					
5.					

Was the test unit's meter adjusted to obtain these readings? Yes ___ No ___

Magnetic Yoke Units:

Alternating current type unit was able to lift 10 lbs.? Yes ✓ No ___

Direct current type unit was able to lift 40 lbs? Yes ✓ No ___

Record the pole spacing: 6 inches

Calibration Check Performed by Scott Lam MT LIII

CALIBRATION CERTIFICATE OF MAGNETIC PARTICLE EXAMINATION EQUIPMENT

Agency performing the check: NES

Equipment Make Packer Model B-300 S/N 88-012 (CP&L)

Calibration Date 9-29-93 Next Cal. Due Date 9-29-94

Units with Ammeters:

Full Scale Reading _____ 10% of Full Scale: _____

Control Meter Make _____ Model _____ S/N _____

Next Cal. Due Date _____

Is documentation available showing traceability to NBS? Yes ___ No

AMMETER READINGS

	Control Meter	Unit Meter	Difference	Adjusted	Difference
1.					
2.					
3.					
4.					
5.					

Was the test unit's meter adjusted to obtain these readings? Yes ___ No

Magnetic Yoke Units:

Alternating current type unit was able to lift 10 lbs.? Yes ✓ No

Direct current type unit was able to lift 40 lbs? Yes N/A No N/A

Record the pole spacing: 8 inches

Calibration Check Performed by Scott Lawson Lvl II 9-29-93

nes

OS2

Sheet 1 of ___

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
CALIBRATION DATA FORM

Tool Description Weight ID No. SRO-MT-001
Temperature 73°F Humidity 65%
Controlled Tool Maintenance Instruction No. N/A
Instrument was found within calibration prior to adjustment Yes ✓ No ___ *
Calibration meets required accuracy: Yes ✓ No ___
Calibration performed by: Robert P. Krueger Date 10-19-89
Calibration reviewed by: James D. Wilhelm Date 10-19-89
Reference Standards: Weight CPL 4301-A-9 Weight CPL 4301-A-1 Temp Rec
Standard ID number: RS119 RS119 RS 49
Cal. Due Date: 12-1-90 12-1-90 2-14-90

* If the instrument is found out of calibration, follow the instructions outlined in MMM-006.

STANDARD READING	AS FOUND		ALLOWABLE ERROR	AS LEFT	
		ACTUAL ERROR			ACTUAL ERROR
10.00 Lbs. 11.00 Lbs.	10.76 Lbs	+ .76 Lb.	+1 Lb. -0 Lb.		

COMMENTS: SRO-MT-001 VERIFIED AGAINST STANDARD WEIGHTS RS119

Figure 1

RS119

NORTH CAROLINA DEPARTMENT OF AGRICULTURE

STANDARDS DIVISION

P.O. BOX 27647/Dept.SD, RALEIGH, N.C. 27611
(919)733-4411

N. DAVID SMITH, DIRECTOR

JAMES A. GRAHAM
COMMISSIONER OF AGRICULTURE

WILLIAM G. PARHAM, JR.
DEPUTY COMMISSIONER

STATEMENT OF TRACEABILITY

SUBMITTED BY: Carolina Power & Light
Shearon Harris Nuclear Plant
P. O. Box 165
State Road 1134
New Hill, NC 27562

DATE OF TEST: December 1, 1988
STATE TEST NUMBER: NC 002315L
TOLERANCE: NBS CLASS F

One Set of Stainless Steel Weights in Wooden Box - SHNPP RS119, Containing:

3 - 10 lb weights - #4301-A-7, 4301-A-8, and 4301-A-9

3 - 5 lb weights - #4301-A-4, 4301-A-5, and 4301-A-6

2 - 2 lb weights - #4301-A-2, 4301-A-3

1 - 1 lb weight - #4301-A-1

he items described above have been compared with the standards of the State f North Carolina, and are traceable to The National Bureau of Standards, via . B. S. Report No.: 523/236653.

L. F. Eason

METROLOGIST

L. F. Eason

SHERRY TEACHEY

Grumman Aircraft Systems
Bethpage, New York 11714-3582

QUALITY ASSURANCE DEPARTMENT
MEASUREMENT STANDARDS SECTION

REPORT OF CALIBRATION

SUBMITTED BY : NUCLEAR ENERGY SERVICE
SHELTER ROCK RD
DANBURY CT 06810-7095

PURCHASE ORDER:	N20835	CAL DATE :	3-15-93
NOMENCLATURE :	RADIOMETER ULTRAVIOLET	MODEL :	DM-365N
MANUFACTURER :	SPECTROLINE	SERIAL NO:	810082
PROCEDURE NO. :	C1570008 REV: --	CUST IDEN:	NONE

THE ABOVE ITEM WAS CALIBRATED IN ACCORDANCE WITH GRUMMAN AIRCRAFT CALIBRATION PROCEDURES AND MIL-STD-45662A, UTILIZING STANDARDS TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

ACTUAL VALUES AND STANDARDS USED ARE LISTED ON THE ATTACHED DATA SHEETS.

NOTE: AS FOUND - "B" RANGE IN TOLERANCE, AS LEFT - LIMITED USE.

LIMITED USE: CALIBRATED ON 'B' RANGE ONLY

JOHN E. BROWER
ENGINEERING SUPERVISOR

GRUMMAN AEROSPACE AND ELECTRONICS
MEASUREMENT STANDARDS
BETHPAGE, NEW YORK 11714-3582

ULTRAVIOLET INTENSITY METER CALIBRATION

MANUFACTURER : SPECTRONICS CORPORATION

MODEL NUMBER : DM-365N

IDENT NUMBER : NONE

SERIAL NUMBER : 810082

CUSTOMER : NUCLEAR ENERGY SERVICE

CALIB DATE : 03-15-93

PROCEDURE : 1570008

ACCURACY : +/-5% rdg

CERTIFIED BY : MS 256

******* CALIBRATION RESULTS *******

TRANSFER STANDARD (uW/cm^2)	METER TOLERANCE		AS RECEIVED DATA (uW/cm^2)	AS ADJUSTED DATA (uW/cm^2)
	MIN	MAX		
800	760	840	780	
1000	950	1050	990	
1200	1140	1260	1204	
1400	1330	1470	1418	

ENVIRONMENTAL CONDITIONS DURING THE CALIBRATION

TEMPERATURE : 68 Degrees F

HUMIDITY : 32 % R.H.

CALIBRATION TRANSFER STANDARD USED FOR THIS CALIBRATION

IDENT NUMBER : 362308M

CALIB DUE DATE : 06-15-93

THE CALIBRATION ABOVE CONFORMS TO MIL-STD-45662A AND IS TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST).

NES, INC

H. B. ROBINSON 1993 OUTAGE
THERMOMETER INVENTORY

SERIAL NO.
962
JL 91-03
MR 92-04
MR 92-03
CCHBR 16016 (CPL)

INSTRUMENT CERTIFICATION

DUKE POWER COMPANY
GENERATION SERVICES DEPARTMENT
13339 HAGERS FERRY ROAD
HUNTERSVILLE, N.C. 28078

THIS IS TO CERTIFY THAT THE INSTRUMENT LISTED BELOW WAS CALIBRATED IN COMPLIANCE WITH APPROVED LABORATORY METHODS AS DOCUMENTED IN THE DUKE POWER COMPANY STANDARDS LABORATORY OPERATIONS MANUAL. THROUGH THE USE OF THESE METHODS, TRACEABILITY IS MAINTAINED TO THE UNITED STATES NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY OR TO A NATURAL PHYSICAL CONSTANT.

OWNER'S ID # CCHBR 16016

INSTRUMENT ID NO:----------CCHBR16016

INSTRUMENT DESCRIPTION:-----THERM,DIG TC

INSTRUMENT MODEL NUMBER:-----873F

INSTRUMENT SERIAL NO:-----T06016

THIS INSTRUMENT WAS FOUND IN **SATISFACTORY** CONDITION

REMARKS:_____

_____

_____

_____

CALIBRATION DATE:---------- 93-08-18

CALIBRATION EXPIRATION DATE:-----94-08-18

TEST NUMBER:----------930818CCHBR16016

APPROVED BY: R E Lindsay

CAROLINA POWER & LIGHT
PO NUMBER: 594330
R058

TEST REPORT COVER SHEET

Previous Test Report Number---------- 921110CCHBR16016

Reference Procedure Number---------- KEG-870.04

Instrument Identification Number------ CCHBR16016

Instrument Serial Number------------- T06016

Instrument Manufacturer-------------- OMEGA

Instrument Model Number-------------- 873F

Instrument Description--------------- DIGITAL THERMOMETER T/C

STATUS AT RECEIPT [X] Satisfactory [ ] Out-of-Tolerance [ ] Inoperable

[ ] Test Only - No Calibration Performed

[X] Calibration ACCEPTED [ ] Accepted 'One Time Calibration

[ ] Calibration Restricted

[ ] Limited Use - Limits as Follows:

[ ] Corrections Must Be Used

[ ] Relative Calibration

[ ] Rejected - Unacceptable For Use

CALIBRATION DATE 930818

DUKE POWER

GENERATION SERVICES DEPARTMENT

STANDARDS LABORATORY

Prepared By _____
TJ.RICHARD

Checked By _____

Function Tested: Temperature
Range Tested: -35 to 1990 °F (type K)
Job No. 300749 AMB Temp. 21°C AMB Humidity 55%RH

TEST EQUIPMENT USED

Test Equipment	I.D. Number	Cal. Exp. Date
DATA LOGGER	SLIAC10818	940308.
SENSOR-AMBIENT	SLIAC11117	930904.
ICE BATH	SLIAC10513	NCR .
FLUKE 2205A SWCH.CNTR.	SLIAC11305	NCR .
SOLARTRON 7081 DMM	SLIAC11222	931001.
HART OIL BATH	SLIAC11335	NCR .
HART SALT BATH	SLIAC11376	NCR .
ECTRON 1120 SIM.	SLIAC10008	930819.
PRT	SLIAC11259	940617.

Remarks

T.I. TOLERANCE = See attached data sheets.

ACCURACY RATIO ≥ 4:1 via simple summation.

PRT notes: SLIAC11259.....ICE POINT = 25.5576Ω.....SHIFT = +3m°F

Note: CP&L tolerance is : ±5% of F.S. (± 30°F).

Enclosure 5.5

DATA SHEET
Keithley Digital Thermometer
MODEL NO: 871

* = (OOT)

Nominal Temp.(°F)	TI Range	mV "K" Input	Tol. (°F)	As Found (°F)	As Left (°F)
−35	200	−1.424	−33.1 to −36.9	−34.7	−35.2
−20	200	−1.114	−18.1 to −21.9	−19.7	−20.1
0	200	−0.692	−1.8 to +1.8	0.6	0.3
20	200	−0.262	18.1 to 21.9	20.5	20.2
32	200	0.000	30.1 to 33.9	32.5	32.2
40	200	0.176	38.1 to 41.9	40.4	40.0
60	200	0.619	58.0 to 62.0	60.2	59.8
80	200	1.068	78.0 to 82.0	80.2	79.7
100	200	1.520	98.0 to 102.0	100.3	99.8
120	200	1.977	117.9 to 122.1	120.7	120.1
140	200	2.436	137.8 to 142.2	140.7	140.1
160	200	2.896	157.8 to 162.2	160.6	159.9
180	200	3.358	177.7 to 182.3	180.5	179.7
195	200	3.704	192.7 to 197.3	195.4	194.6

*TI Tolerance: ± (0.25% of Reading + 1.8°F)

Enclosure 5.6

DATA SHEET
Keithley Digital Thermometer
MODEL NO: 871

Nominal Temp.	TI Range	mV "K" Input	Tol. (°F)	As Found (°F)	As Left (°F)
-35	2000	-1.424	-33 to -37	-34	-34
0	2000	-0.692	-2 to +2	0	0
200	2000	-3.819	198 to 202	201	201
400	2000	8.314	397 to 403	400	400
600	2000	12.854	597 to 603	600	600
800	2000	17.523	796 to 804	801	800
1000	2000	22.251	996 to 1004	1000	1000
1200	2000	26.975	1195 to 1205	1201	1200
1400	2000	31.629	1395 to 1405	1401	1400
1600	2000	36.166	1594 to 1606	1600	1600
1800	2000	40.575	1794 to 1806	1800	1799
1990	2000	44.645	1983 to 1997	1990	1990
°C	–	–	°C	°C	°C
1000	1370	41.269	997 to 1004	N/A	N/A

* Tolerance: ± (0.25% of Reading + 1.8°F)
(0.25% of Reading + 1.0°C)

Enclosure 5.17

DATA SHEET
Keithley Digital Thermometer
Probe Calibration

Check one

✓ °F	
°C	

ALL READINGS BELOW ARE IN :

PROBE #	NOMINAL TEMP.	ACTUAL TEMP.	** TI R/O	*T.I. CORR.	****TOL. (Probe)	Probe Error ***	
						As Found	As Left
1	200.0	200.242	202	0.00	±4.0	1.8	Same as
1	400.0	398.027	400	0.00	±4.0	2.0	"As Found"
1	600.0	599.861	600	0.00	±4.5	0.1	↓

* Note: TI Correction from Display Data Sheet (sign is opposite of error).
** Note: TI Range to, High Range /°F.
*** Probe Error = TI corrected for display error (−) Actual Test Temp.
**** Keithley Probe Tolerance is ± 4°F or 3/4% whichever is greater or per MFG Tol's.

REV.: 1 900606
SSQU155

nes

THERMOMETER CHECK RECORD

USE FOR CONTROL THERMOMETER(S)
CONTROL THERMOMETER DATA

SERIAL NUMBER	LOW°	HIGH°	ACCEPTANCE CRITERIA	ACCEPT	REJECT
1.		N	Differential of 2% between #1 and #2 high & low readings		
2.		A			

USE FOR FIELD THERMOMETERS
Check Readings
at > 50°Δ

	CHECK DATE	VOID DATE	LOW°	HIGH°	SERIAL NO.	ACCEPT/ REJECT
CONTROL	7-16-93	7-16-94	50	104	7N362	
FIELD	8-3-93	11-3-93	52	100	MR 92-03	Acc
	8-3-93	11-3-93	54	106	MR 92 04	Acc
	8-3-93	11-3-93	51	102	MR 92 06	Acc
	8-3-93	11-3-93	49	101	962	Acc
	8-3-93	11-3-93	49	102	JL 91 05	Acc

INSTRUCTIONS:

1) Place Control Thermometer in a can of water.

2) Place a Field Thermometer(s) on side of the can.

3) Wait a minimum of ten minutes, then record low readings.

4) Warm the water in the can at least 50° higher than the temperature of the reading in (3).

5) Wait a minimum of ten minutes, then record high readings.

NOTE: ENSURE THAT THE WATER TEMPERATURE DOES NOT DROP BELOW THE DIFFERENTIAL MINIMUM OF 50°F.

6) The temperature readings of the Field Thermometers must be within 5% of the Control Thermometers or 5°F, whichever is greater.

7) Retain a copy of this form for your records, mail a copy to the equipment technician for filing at the Home Office.

TEST CONDUCTED BY: Scott Larson — SIGNATURE

8-3-93 — DATE

NEWCO, INC.

Post Office Box 4013, Florence, South Carolina 29502-4013

Material Test Equipment

(803) 669-2988
(803) 664-0197 (Fax

CERTIFICATE OF CONFORMANCE

P.O. NUMBER: 7F5456BJ

DATE OF ORDER: March 15, 1993

PART NUMBER: 2 each ULTRAGEL II (BATCH # 093001)

THIS IS HEREBY CERTIFIED THAT ALL MATERIALS HEREWITH FURNISHED AGAINST THE ABOVE PURCHASE ORDER NUMBER CONFORM TO ALL SPECIFICATION REQUIREMENTS.

NEWCO, INC.
COMPANY

Dax Williams
SIGNATURE

OFFICE MANAGER
TITLE

MARCH 15, 1993
DATE

ECHO
ULTRASOUND

March 11, 1993

NEWCO
301 Second Loop Road
Florence, SC 29502

CERTIFICATE OF CONFORMANCE

This letter is to certify that the material shipped 3-11-93, against your Purchase Order 7496, to be ULTRAGEL II, Batch Number 093001.

ULTRAGEL II is tested in accordance to ASTM-D-808 and D-129 to have less than 50 ppm Halogen (Chloride) and Sulphur. Total Fluorine was tested to have less than 50 ppm. Copies of these certifications are enclosed.

Lead, mercury, cadmium, tin, zinc, antimony, bismuth, arsenic, gallium, silver, indium, their alloys and or their compounds are not been deliberately added to this product.

The shelf life has been approved for a period of two years from date of shipment. The temperature operating range is -10° to 325°F.

If you require additional information, please call me at 800-233-0261.

Best Regards,

David J. Szczupakowski
Quality Assurance Engineer

jr

Enclosures:
Certs
MSDS
Total Fluorine Test

R.R. 2, BOX 118, REEDSVILLE, PA 17084-9772 USA
TELEPHONE 800-233-0261, 717-667-3266, FAX 717-667-6843, TELEX 9103806749

APPLIED TECHNICAL SERVICES, INCORPORATED

Branch Office
1218 Donaldson Road
Greenville, South Carolina 29605
(803) 299-0525
Fax # (803) 277-5824

Main Office
1190 Atlanta Industrial Drive
Marietta, Georgia 30066
(404) 423-1400
Fax # (404) 424-6415

Branch Office
108-A Castle Drive
Madison, Alabama 35758
(205) 837-7777
Fax # (205) 830-4474

CERTIFIED TEST REPORT

REF C24232 DATE January 14, 1992 PAGE 1 OF 1

CHEMICAL ANALYSIS

CUSTOMER: Echo Ultrasound, P. O. Box 118, Reedsville, Pennsylvania 17084-9772

Attention: Scott Walters

ORDER NO.: 40331 SJK PART NO /NAME: Ultragel II, Batch 092031

MATERIAL DESIGNATION: Ultrasonic Couplant

SPECIAL REQUIREMENT: N/A

LAB COMMENT: Analyzed by (ICP) atomic emission and wet chemical techniques.

TEST RESULTS

	COMPOSITION Parts per Million										
IDENTIFICATION	S	Cl									
ALLOY OR SPEC. REQ. (1)	(1)	(2)									
Batch # 092031	2	17									
			Analysis Guidelines								
			ASTM-D129-64								
			ASTM-D808-81								
			ASTM-D512-81								
			**** LAST ITEM ****								

Patricia L. DuBose
Notary Public, Cobb County, Georgia
My Commission Expires Jan. 29, 1996

(1) ASTM D129/ICP-AE (Total Sulfur)
(2) ASTM D808/D512 $Hg(NO_3)_2$ Method (Total Chlorine)

Prepared by W. M. Katter
Chemist

Approved by P. E. Rogers
Manager

APPLIED TECHNICAL SERVICES INC.

APPLIED TECHNICAL SERVICES, INCORPORATED

[illegible] Atlanta Industrial Drive, Marietta, Georgia 30066 • (404)423-1400

CHEMICAL TEST REPORT

Ref. C43225-1 Date September 20, 1992 Page 1 of 1

Customer: Echo Ultrasound, R. D. Box 118 Reedsville, Pennsylvania 17084-9772

Attention: Scott Walters

Purchase Order #: 45247 SJK Part #/Name: Ultragel II (Batch 093051)

Material Designation: Ultrasonic Couplant

Special Requirement: N/A

Lab Comment: Analyzed by (ICP) atomic emission, electrometric, wet chemical techniques

Test Results

Composition: (Parts per Million)

Identification	S	Cl
Allot or Spec. Req. (1)	(1)	(2)
[illegible]gel II (Batch 093051)	3	15

Analysis Guidelines

ASTM-D129-64

ASTM-D808-91

ASTM-D512-89

****LAST ITEM****

(1) ASTM D129/ICP-AE (Total Sulfur)
(2) ASTM D808/D512 Hg $(NO_3)_2$ Method (Total Chlorine)

Prepared by W. M. Katter
Senior Chemist

Approved by P. E. Roger
P. E. Roger
Manager

Notary Public, Cobb County, Georgia
My Commission Expires March 22, 1997

APPLIED TECHNICAL SERVICES, INCORPORATED

Branch Office
1218 Donaldson Road
Greenville, South Carolina 29605
(803) 299-0525
Fax # (803) 277-5824

Main Office
1190 Atlanta Industrial Drive
Marietta, Georgia 30066
(404) 423-1400
Fax # (404) 424-6415

Branch Office
108-A Castle Drive
Madison, Alabama 35758
(205) 837-7777
Fax # (205) 830-4474

CERTIFIED TEST REPORT

REF C34744-1 | DATE January 13, 1993 | PAGE 1 OF 1

CHEMICAL ANALYSIS

CUSTOMER: Echo Ultrasound, P.O. Box 118, Reedsville, Pennsylvania 17084-9272

ORIGINAL

Attention: Scott Walters

ORDER NO.: 43640 PART NO /NAME: Ultragel II (batch 093001)

MATERIAL DESIGNATION: Ultrasonic Couplant

SPECIAL REQUIREMENT: N/A

LAB COMMENT: Analyzed by (ICP) atomic emission and wet chemical techniques.

TEST RESULTS

IDENTIFICATION	COMPOSITION Parts per Million S	Cl	
ALLOY OR SPEC. REQ. (1)	(1)	(2)	
Ultragel II (batch 093001)	7	28	
			Analysis Guidelines
			ASTM-D129-64
			ASTM-D808-81
			ASTM-D512-81
			**** LAST ITEM ****

Nancy Putnam, Cobb County, Georgia
My Commission Expires August 29, 1996

ORIGINAL

(1) ASTM D129/ICP-AE (Total Sulfur)
(2) ASTM D808/D512 Hg(NO3)2 Method (Total Chlorine)

Prepared by W. M. Kaczar, Chemist

Approved by T. E. Rogers, Manager

MAGNAFLUX®

DATE: July 28, 1993

PURCHASE ORDER NO. 719867AV

We hereby certify that the Magnetic Particle Inspection Material type 14AM Prepared Magnaglo Bath, Batch No. 93G02P meets the requirements of the following specifications:

A. ASME Boiler and Pressure Vessel Code, Section V, 1989 & 1992 Edition, Nondestructive Examination, Paragraphs T-723,T-726(b) and Article 25 as applicable.

B. ASTM E-709-80, Paragraphs 6.1, 6.2, 6.4, 6.4.2, 6.4.4.2, and 6.4.5.1.

C. MIL-STD-1949A, 15 May, 1989, Paragraphs 4.9.1, 4.9.1.2, and 4.9.2.

D. MIL-STD-271F(SH), 27 June 1986, Paragraphs 4.3.2.1, 4.3.2.3, and 4.3.2.4.

E. MIL-STD-2132A(SH), 15 March 1985, Paragraphs 6.2.1.3, 6.2.2.3, 6.2.2.4, 6.2.2.5, 6.2.2.6, 6.2.2.7.

F. The flash point of the material is over 200 F when tested by the Pensky-Marten's Closed Cup Method(ASTM D-93).

G. The vehicle meets the requirements of DOD-F-87935, 12 January 1984 and Amendment 3, 27 February 1987.

H. The vehicle meets the requirements of AMS 2641, 1 January 1988. The vehicle is classified as Type I according to Paragraph 1.3.

We further certify that this material does not contain mercury as a basic element and no mercury bearing equipment was used in its manufacture.

Batch numbers appear on labels of bulk containers.

MAGNAFLUX®

M. Plamoottil

M. Plamoottil - Manager, Quality Assurance
Kim Maschmann - Documents Clerk

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Form No. 1565C R-193

MAGNAFLUX®

TO:

Date: December 5, 1983

Purchase Order No. _____

We hereby certify that the Magnetic Particle Inspection Material type

No. 8A Red Powder, Batch No. 831067

meets the requirements of the following specifications:

A. ASME Boiler and Pressure Vessel Code, 1980 Edition, Section V, Nondestructive Examination, with Summer 1980 through Winter 1982 Addenda, Paragraph T-753(a), and Article 25 as applicable.

B. ASTM E 709-80, Paragraphs 6.1, 6.2, and 6.3.

C. NAVSEA 250-1500-1, Rev. 10 June 1979, Paragraph 12.4.1.6.

D. MIL-I-6868E, 27 February 1976, Paragraphs 5.1, 5.2 and 5.3.

E. MIL-STD-271E (SHIPS), ACN-1, 24 October 1980, Paragraphs 4.2.6, 4.3.2.3 and 4.3.3.1.

F. MIL-STD-271E, NTR-1E, June 16, 1978, Paragraph 4.3.2.3.

G. MIL-STD-2132, 16 January 1981, Paragraph 4.2.1.3 and Appendix A, Paragraph 50.4.

We further certify that this material does not contain mercury as a basic element and no mercury bearing equipment was used in its manufacture.

Batch numbers appear on labels of bulk containers.

MAGNAFLUX CORPORATION

A. S. Britton

R. W. Gathman - Director of Quality Assurance
A. S. Britton - Supervisor, Quality Control

Form No. 1565A R-5/83 (1,3A,8A)

MAGNAFLUX A Division of Illinois Tool Works Inc.
306 Industrial Drive DeWitt, Iowa 52742 Telephone: 319 659-8143 Fax: 319 659-9713

FM 312-86: 6

MAGNAFLUX

DATE 5/7/89

TO:

Purchase Order No. 360Y6NI-CC

We hereby certify that the Magnaflux Particle Inspection Material type No. 8A Red Powder, Batch No. 89D040 meets the requirements of the following specifications:

A. ASME Boiler and Pressure Vessel Code, Section V, 1986 Edition, Nondestructive Examination, Paragraphs T-723, T-726(A) and Article 25 as applicable.

B. ASTM E 709-80 Paragraphs 6.1, 6.2, and 6.3.

C. NAVSEA 250-1500-1, Rev. 10 June 1979 and Rev. 11, May 1983, Paragraph 12.4.1.6.

D. MIL-STD-1949, 1 August 1985 Paragraphs 4.10.1 and 4.10.1.1.

E. MIL-STD-271F(SH), 27 June 1986, Paragraphs 4.2.7, 4.3.2.3, and 4.3.3.1

F. MIL-STD-1312A(SH), 6 March 1981, Paragraph 6.2.1.3.

We further certify that this material does not contain mercury as a basic element and n mercury bearing equipment was used in its manufacture.

Batch numbers appear on labels of bulk containers.

MAGNAFLUX CORPORATION

Cheri A. Zeleznik

M. Plamoottil - Manager, Quality Assurance
Cheri A. Zeleznik---Project Manage

Form No. 1565A R-1/89

MAGNAFLUX

DATE: July 6,1993

PURCHASE ORDER NO. 7H7966AV

SUBJECT: Spotcheck Cleaner/Remover TYPE: SKC-S BATCH No. 93F03K

We hereby certify that when tested at the time of manufacture, the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

   (a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

   (b) ASME Boiler and Pressure Vessel Code, 1986,1989, & 1992 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (c) ASTM E-165-80, Paragraph 7.1.

   (d) NAVSEA 250-1500-1 (Rev. 10 June 1979, Rev. 11 May 1983, Rev. 12 December 1987) Paragraphs 12.5.1.1 and 12.5.1.1.1.

   (e) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1.

   (f) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

The following test results were obtained:

Sulfur: 0.0160 wt. % of residue. Halogen: 0.0020 wt. % of residue

Cleaner residue (see Note 3) 0.0066 g/100g. 0.0050 g/100 ml.

2. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX®

Kim Maschmann

M. Piamoottil - Manager, Quality Assurance
Kim Maschmann - Documents Clerk

NOTES:1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3.The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

MAGNAFLUX

DATE: May 14, 1993

PURCHASE ORDER NO. 7R1678AV

SUBJECT: Spotcheck Penetrant TYPE: SKL-SP BATCH No. 93E01K

We hereby certify that when tested at the time of manufacture, the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

   (a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

   (b) ASME Boiler and Pressure Vessel Code, 1986,1989, & 1992 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (c) ASTM E-165-80, Paragraph 7.1.

   (d) NAVSEA 250-1500-1 (Rev. 10 June 1979, Rev. 11 May 1983, Rev. 12 December 1987) Paragraphs 12.5.1.1 and 12.5.1.1.1.

   (e) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1.

   (f) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

The following test results were obtained:

Sulfur: 0.0167 wt. % of residue. Halogen: 0.0078 wt. % of residue

Cleaner residue (see Note 3) NA g/100g. NA g/100 ml.

2. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX®

M. Plamoottil

M. Plamoottil - Manager, Quality Assurance

Kim Maschmann - Documents Clerk

NOTES:1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3. The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

Form No. 1500 R-2/93

MAGNAFLUX A Division of Illinois Tool Works Inc.
306 Industrial Street | DeWitt Iowa 52742 | Telephone 319-659-8143 | Fax 319-659-9713

MA

DATE: May 14, 1993

PURCHASE ORDER NO. 71167/A

SKI-SP

BATCH No. 93E01K

SUBJECT: Spotchek Penetrant

We hereby certify that [illegible] manufacture the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

(a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, Including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

(b) ASME Boiler and Pressure Vessel Code, 1986,1989, & 1992 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

(c) ASTM E-165-80, Paragraph [illegible]

(d) NAVSEA 250-1500-1 (Rev. 1 to June 1979, Rev. 11 May 1983, Rev. 12 December 1
Paragraphs 12.5.1.1 and 12.5.1.1.1

(e) MIL-STD-271F(SH) 27 June 1986, Paragraphs 5.3 and 5.3.1.

(f) MIL-STD-2132A(SH) 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

The following test results were obtained:

Sulfur: 0.0167 wt. % of residue Halogen: 0.0078 wt. % of residue

Cleaner residue (see Note 3) NA g/100g. NA g/100 ml.

2. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX

M. Plamoottil - Manager, Quality Assuran
Kim Aeschmann - Documents Clerk

NOTES: 1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3. The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

MAGNAFLUX

May 14, 1993

PURCHASE ORDER NO. 78167/AA

We hereby certify that the Spotcheck Penetrant, Type SKL-SP

Batch No. 93E01K [illegible] Requirements of MIL-I-25135E, and is approved by the U.S. Air Force.

When tested according to paragraph 4.5.2 of MIL-I-25135E the following results were obtained:

(a) Flash Point (PMCC), 4.5.3	220 F
(b) Viscosity, (3.4 cs Nominal), 4.5.4	3.23 cs @ 38 C
(c) Developer Fluorescence, 4.5.14	NA
(d) Water Content, 4.5.21	NA %
(e) Penetrant Removability, 4.5.17 (MIL-I-25 Standard)	PASSES
(f) Water Tolerance, 4.5.12	NA %
(g) Fluorescent Brightness of Penetrants, 4.5.7 (L Standard)	NA %
(h) Surface Wetting, 4.5.6	PASSES
(i) Thermal Stability, 4.5.9	NA %
(j) Redispersibility, 4.5.13	NA
(k) Valve Leakage, 4.5.20	PASSES
(l) Net Content, 4.5.19	240-270 gm.

We further certify that this material meets the requirements of MIL-STD-6866 (29 November 1985), Paragraph 4.4.1 and where applicable, 5.8.4.

MAGNAFLUX

M. Piemontese - Manager, Quality Assurance

Kim Maschmann - Documents Clerk

MAGNAFLUX PROVIDED

THE SUPPLIES COVERED BY CONTRACT NUMBER H1678AV VIA

UPS ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS FOR

SHIPMENT THESE SUPPLIES ARE OF THE QUALITY SPECIFI

AND ARE IN ALL RESPECTS IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS,

INCLUDING SPECIFICATION AND/OR DRAWING, PRESERVATION, PACKAGING, AND

PACKING AND MARKING REQUIREMENTS, PHYSICAL ITEM IDENTIFICATION, AND IN

THE QUANTITY SHOWN ON THIS OR THE ATTACHED DOCUMENT. THE MATERIAL

SUPPLIED WAS PROCESSED ACCORDING TO QUALITY ASSURANCE MANUAL DATED

1/9/89, REV 5

Spotcheck Penetrant, Type SKL-SP
B/N 93E01K, P/N 01-5149-68
Manufacture Date: May 1993
Expiration Date: 2 Years
Quantity: 6 aerosol cases

DATE: May 14, 1993

NAME & TITLE: Kim Maschmann

Mathew J. Scottil, Quality Assurance Manager

Kim Maschmann, Documents Clerk

PURCHASE ORDER NO. [illegible]

SUBJECT: Spotcheck Developer TYPE: SKD-NF BATCH No. 93B04K

We hereby certify that when tested at the time of manufacture, the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

   (a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

   (b) ASME Boiler and Pressure Vessel Code, 1986 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (c) ASME Boiler and Pressure Vessel Code, 1989 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (d) ASTM E-165-80, Paragraph 7.1.

   (e) NAVSEA 250-1500-1 (Rev. 10 June 1979, Rev. 11 May 1983, Rev. 12 December 1987) Paragraphs 12.5.1.1 and 12.5.1.1.1.

   (f) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1.

   (g) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

The following test results were obtained:

Sulfur: 0.0091 wt. % of residue. Halogen: 0.0073 wt. % of residue

Cleaner residue (see Note 3) NA g/100g. NA g/100 ml.

2. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX®

M. Piamoottil - Manager, Quality Assurance
Kim Maschmann - Documents Clerk

NOTES:1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3.The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

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Form No. 1569 R-1/91

MAGNAFLUX A Division of Illinois Tool Works Inc
306 Industrial Drive DeWitt, Iowa 52742 Telephone 319 659-8143 Fax 319 659-9713

Purchase Order/Contract No. N/A

We hereby certify that the [redacted] Developer, Type SKD-NF

Batch No. 92A01P [redacted], supplied meets the requirements of MIL-I-25135E, and is approved by the U.S. Air Force.

When tested according to paragraph 4.4.1.2., Sampling Plan A, the following results were obtained:

(a)	Flash Point (PMCT), 4.5.3	NONE °F
(b)	Viscosity, (_____ cs Nominal), 4.5.4	NA cs @ 100°F
(c)	Developer Fluorescence, 4.5.14	PASSES
(d)	Water Content, 4.5.21	NA %
(e)	Penetrant Removability, 4.5.17 (_____ Standard)	NA
(f)	Water Tolerance, 4.5.12	NA %
(g)	Fluorescent Brightness of Penetrants, 4.5.7 (_____ Standard)	NA %
(h)	Surface Wetting, 4.5.6	NA
(i)	Thermal Stability, 4.5.9	NA %
(j)	Redispersibility, 4.5.13	PASSES
(k)	Valve Leakage, 4.5.20	PASSES
(l)	Net Content, 4.5.19	400-420 gm.

We further certify that this material meets the requirements of MIL-STD-6866 (29 November 1985), Paragraph 4.4.1 and where applicable, 5.8.4.

MAGNAFLUX®

M. Plamoottil

M.J. Plamoottil - Manager, Quality Assurance

Form No. 15798
Rev 10/89

4009 - 1823

11

Item [redacted] Batch [redacted] 92 01

We hereby certify that [redacted] is in accordance with the requirements of [redacted] Mod [redacted] and tests and inspections according to:

(a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

(b) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

(c) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

(d) ASTM E165-80, Paragraph 7.1

(e) NAVSEA 250-1500-1 (Rev. 0, Jun 1978) (Rev. 1, May 1983, Rev. 2 December 1987 Paragraphs 12.5.1 and 12.5.1.1

(f) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1

(g) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30

The following test results were obtained:

Sulfur: 0.0090 wt. % of residue Halogen: 0.0283 wt. % of residue

Cleaner residue (see Note 3) NA g/100g NA g/160 ml

2. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in the manufacture.

[redacted]

M. Plamondon

M. Plamondon, Manager, Quality Assurance

NOTES: 1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert a percent figure to parts per million, move the decimal four places to the right.
3. The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

PO: [illegible]

Item	Qty	Description	Source Inspect	Sample	Document	Date	Release Inspect	Release Blanket	Receiving Inspect	Physical Prop	ID & Marking	Physical Damage	Cleanliness	Workmanship	Lubrication	Coat & Press	Dimensions	Weld Prep	Cover & Seal
01	7	CLEVIS, TYP SPOTCHECK P/N SKC-NF			X						X	X	X						

Inspections Required
Inspections Performed A=Accept R=Reject

ID#	Manufacturer	ID#	Manufacturer
BATCH 92D02P	MAGNAFLUX		

Calibrated Tools Used N/A Model No. ____ SN ____ Mfg ____

Remarks:

INSPECTED BY: Gary Beasley Rec. Insp 6/9/92 Date

REVIEWED BY: [signature] 6/10/92 Date

Corrective Action/Disposition Details:

COMPLETED BY: ____ Rec. Insp. ____ Date

REVIEWED BY: ____ Date

[redacted]

PURCHASE ORDER NO. [redacted]

SUBJECT: Spotcheck Cleaner/Remover [redacted] TYPE: SKC-NF BATCH No. 92D02P

We hereby certify that when tested at the time of manufacture, the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

   (a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

   (b) ASME Boiler and Pressure Vessel Code, 1986 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (c) ASME Boiler and Pressure Vessel Code, 1989 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (d) ASTM E-165-80, Paragraph 7.1.

   (e) NAVSEA 250-1500-1 (Rev. 10 June 1979, Rev. 11 May 1983, Rev. 12 December 1987) Paragraphs 12.5.1.1 and 12.5.1.1.1.

   (f) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1.

   (g) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

2. The following test results were obtained:

   Sulfur: NA wt. % of residue. Halogen: NA wt. % of residue

   Cleaner residue (see Note 3) 0.0014 g/100g. 0.0018 g/100 ml.

3. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX®

M. Plamoottil

M. Plamoottil - Manager, Quality Assurance

NOTES: 1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3. The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

Form No. 1569 R-1/91

[redacted] 5, 1992

Purchase Order/Contract No. [redacted]

We hereby certify that the Spotcheck Cleaner/Remover, Type SKC-NF
Batch No. 92D02P, supplied meets the requirements of MIL-I-25135E, and is approved by the U.S. Air Force.

When tested according to paragraph 4.4.1.2., Sampling Plan A, the following results were obtained:

(a) Flash Point (PMCT), 4.5.3	NONE °F
(b) Viscosity, (_____ cs Nominal), 4.5.4	NA cs @ 100°F
(c) Developer Fluorescence, 4.5.14	NA
(d) Water Content, 4.5.21	NA %
(e) Penetrant Removability, 4.5.17 (R-1 Standard)	PASSES
(f) Water Tolerance, 4.5.12	NA %
(g) Fluorescent Brightness of Penetrants, 4.5.7 (_____ Standard)	NA %
(h) Surface Wetting, 4.5.6	NA
(i) Thermal Stability, 4.5.9	NA %
(j) Redispersibility, 4.5.13	NA
(k) Valve Leakage, 4.5.20	PASSES
(l) Net Content, 4.5.19	397-420 gm

We further certify that this material meets the requirements of MIL-STD-6866 (29 November 1985), Paragraph 4.4.1 and where applicable, 5.3.4.

MAGNAFLUX®

M. Plamoottil

M.J. Plamoottil - Manager, Quality Assurance

Form No. 15793
Rev 10/89

[redacted]

PURCHASE ORDER NO. [redacted]

SUBJECT: Spotcheck Cleaner/Remover [redacted] TYPE: SKC-NF BATCH No. 92D02P

We hereby certify that when tested at the time of manufacture, the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

   (a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

   (b) ASME Boiler and Pressure Vessel Code, 1986 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (c) ASME Boiler and Pressure Vessel Code, 1989 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (d) ASTM E-165-80, Paragraph 7.1.

   (e) NAVSEA 250-1500-1 (Rev. 10 June 1979, Rev. 11 May 1983, Rev. 12 December 1987) Paragraphs 12.5.1.1 and 12.5.1.1.1.

   (f) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1.

   (g) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

2. The following test results were obtained:

   Sulfur: NA wt. % of residue. Halogen: NA wt. % of residue

   Cleaner residue (see Note 3) 0.0014 g/100g. 0.0018 g/100 ml.

3. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX®

M. Piamoottil

M. Piamoottil - Manager, Quality Assurance

NOTES: 1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3. The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

PURCHASE ORDER NO. [redacted]

SUBJECT: Spotcheck Cleaner/Remover [redacted] TYPE: SKC-NF BATCH No. 92D02P

We hereby certify that when tested at the time of manufacture, the above material:

1. Meets the requirements of and has been tested for sulfur and halogens according to:

   (a) ASME Boiler and Pressure Vessel Code, 1983 Edition, Section V, Nondestructive Examination, including all Addenda though Winter 1983 Addendum, Paragraph T-625 and Article 24 as applicable.

   (b) ASME Boiler and Pressure Vessel Code, 1986 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (c) ASME Boiler and Pressure Vessel Code, 1989 Edition, Section V, Nondestructive Examination, Paragraph T-625 and Article 24 as applicable.

   (d) ASTM E-165-80, Paragraph 7.1.

   (e) NAVSEA 250-1500-1 (Rev. 10 June 1979, Rev. 11 May 1983, Rev. 12 December 1987) Paragraphs 12.5.1.1 and 12.5.1.1.1.

   (f) MIL-STD-271F(SH), 27 June 1986, Paragraphs 5.3 and 5.3.1.

   (g) MIL-STD-2132A(SH), 15 March 1985, Paragraphs 7.1.1, 7.1.2, and 7.1.3 and Appendix C, Paragraph 30.

2. The following test results were obtained:

   Sulfur: NA wt. % of residue. Halogen: NA wt. % of residue

   Cleaner residue (see Note 3) 0.0014 g/100g. 0.0018 g/100 ml.

2. We further certify that this material does not contain mercury as a basic element, and no mercury bearing equipment was used in its manufacture.

MAGNAFLUX®

M. Piamoottil

M. Piamoottil - Manager, Quality Assurance

NOTES: 1. Our batch number appears on the bottom of all aerosol cans and on the label of all bulk containers.
2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to "parts per million" move the decimal four places to the right.
3. The above certification gives the results obtained at the time of manufacture. Age and use may alter the properties of any material.

I HEREBY CERTIFY THAT ON May 1992 MAGNAFLUX PROVIDED THE SUPPLIES CALLED FOR BY CONTRACT NUMBER 602186AV VIA UPS IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS FOR SHIPMENT. I FURTHER CERTIFY THAT THE SUPPLIES ARE OF THE QUALITY SPECIFIED AND ARE IN ALL RESPECTS IN CONFORMANCE WITH THE CONTRACT REQUIREMENTS, INCLUDING SPECIFICATIONS AND/OR DRAWING, PRESERVATION, PACKAGING, AND PACKING AND MARKING REQUIREMENTS: PHYSICAL ITEM IDENTIFICATION, AND IN THE QUANTITY SHOWN ON THIS OR THE ATTACHED DOCUMENT.

Spotcheck Cleaner/Remover, Type SKC-NF
B/N 92D02P, P/N 01-5719-68
Manufacture Date: April 1992
Expiration Date: 2 Years
Quantity: 7 aerosol cases

DATE: May 20,1992

NAME & TITLE: Mathew Plamoottil

Mathew Plamoottil, Quality Assurance Manager