SHOP
PRE-SERVICE INSPECTION
PROGRAM
for
LOUISIANA POWER & LIGHT
Waterford 3
Steam Electric Station

DOCUMENT No. TR - ESS - 031

THIS IS ▶

VOLUME 1 SHOP PRE-SERVICE INSPECTION PROGRAM - PROGRAM PLAN

VOLUME 2 SHOP PRE-SERVICE INSPECTION PROGRAM - PROCEDURES

VOLUME 3 SHOP PRE-SERVICE INSPECTION PROGRAM - REPORT

VOLUME 4 SHOP PRE-SERVICE INSPECTION PROGRAM - EXAMINATION DATA

VOLUME 5 SHOP PRE-SERVICE INSPECTION PROGRAM - EXAMINATION DATA

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PDR ADOCK 05000382
Q PDR

Prepared By:

SYSTEMS INTEGRITY SERVICES
POWER SYSTEMS GROUP
COMBUSTION ENGINEERING
Windsor, Connecticut

POWER SYSTEMS

PART I

FORM NIS-1 OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS

As required by the Provisions of the ASME Code Rules

1. Owner Louisiana Power & Light, 142 Delaronde St., New Orleans, La. 70174
(Name and Address of Owner)

2. Plant Waterford 3 Steam Electric Station, Taft, Louisiana
(Name and Address of Plant)

3. Plant Unit 3 4. Owner Certificate of Authorization (if required) OWN-122

5. Commercial Service Date N/A 6. National Board Number for Unit See Below

7. Components Inspected

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
RPV and Closure Head	Combusion Engineering	74170	N/A	21694
Steam Generator #1	Combustion Engineering	74270-1	N/A	22156
Steam Generator #2	Combustion Engineering	74270-2	N/A	22157
Pressurizer	Combusion Engineering	74370	N/A	21682

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 data 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.

PART II

FORM NIS-1

8. Examination Dates 8/75 to 5/76 9. Inspection Interval from Shop Preservice Exam

10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval.

Examinations done were most of the volumetric, surface, and visual examinations required on the reactor pressure vessel, reactor pressure vessel closure head, steam generators and pressurizer. For details, see Volume 1 of the Shop Pre-operational Inspection Program, the Program Plan.

11. Abstract of Conditions Noted.

A number of small ultrasonic indications were seen in the components. The reactor pressure vessel had seven (7) small laminar indications and one (1) subsurface elliptical indication, and the pressurizer had one laminar indication. All were within Code acceptance limits. No significant ultrasonic indications were observed in either steam generator. In addition, all components had minor and acceptable visual indications in examination areas which were subjected to visual examinations.

12. Abstract of Corrective Measures Recommended and Taken

On the steam generator #2, liquid penetrant surface examinations of the key lugs and snubber lugs mounted on the secondary side showed porosity indications which were not acceptable. These areas were repaired under the supervision of the fabrication shop's Quality Assurance personnel until the unacceptable indications were removed.

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. 1974 Edition through Summer, 1974 Addenda.

DATE Feb. 7, 1984 Signed Louisiana Power & Light By: Glenn Robin - ISI Coordinator

Certificate of Authorization No. (if applicable) OWN-122 Expiration Date 6/25/85

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Louisiana and employed by Factory Mutual System* of Norwood, Mass. have inspected the components described in this Owner's Data Report during the period Aug.'75 to May '76, 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 Data 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 this Owners' Data 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.

Date 2-24-84 19

*Arkwright-Boston Manufacturers Mutual Insurance Co.

Inspector's Signature

Commissions NB 4122, La. 727, N-I

National Board, State, Province and Co.

INTRODUCTION

The preservice examinations of the reactor vessel, reactor vessel closure head, steam generators and pressurizer for the Waterford 3 Steam Electric Station were performed after their respective hydro tests in the fabrication shops of Combustion Engineering, Inc., the manufacturer of the components, in Chattanooga, Tennessee, during the interval between August 1975 and May 1976. The examinations were conducted in accordance with Section XI of the ASME Boiler and Pressure Vessel Code.

In the performance of this examination, the Combustion Engineering/Automation Industries (C-E/Aii) team operated in the role of examiners, and Factory Mutual Engineering served as inspectors, as defined in IWA-2110 of Section XI. By this arrangement, Factory Mutual Engineering reviewed the applicable procedures, witnessed the examinations, reviewed examiner qualifications and checked for general code compliance, as specified in IWA-2120 of Section XI. The Factory Mutual Engineering representative was continuously informed of the examination schedules so that he could witness any examination or operation which would be required in the performance of his function as inspector.

A number of reportable indications were found during the examinations; all, however, were within the acceptance limits of Section XI.

The Preoperational Examination Program and Report is presented in five volumes:

Volume 1 - Program Plan Book

Volume 2 - Procedures

Volume 3 - Report

Volume 4 - Data

Volume 5 - Data

This volume, Volume 3, reports the results of the examination. All significant indications are reported and discussed herein, and the results for all areas of examination are listed in the tables of Appendix 1.

TABLE OF CONTENTS

I. Introduction i

II. Table of Contents iv

III. Summary and Conclusions 1

IV. Discussion 3

A. General 4

B. Equipment 5

1. Manual 5

2. Mechanical 5

3. Automated Data Acquisition System 7

4. Visual and Surface Examination Equipment 7

C. UT Calibration Standards 10

D. Examination Procedures 30

E. Evaluation Criteria 37

F. General Examination Techniques 38

1. Ultrasonic Examinations 38

2. Surface Examinations 43

3. Visual Examinations 43

G. Examination Details and Results 45

1. Reactor Pressure Vessel 45

2. Reactor Pressure Vessel Closure Head 49

3. Steam Generators 49

4. Pressurizer 50

Appendix 1 Summary Data Tables

Appendix 2 Equipment and Material Certifications

Appendix 3 Personnel Certifications

TABLE OF CONTENTS

(Continued)

List of Figures

Figure 1 Views of Reactor Vessel Flange Examination Track and Device

Figure 2 PaR Model ISI-2 Vessel Examination Device

Figure 3 Control Console for PaR Examination Tool

Figure 4 Nozzle Examination Device and Control Consoles

Figure 5 Shell Side Nozzle Scanner

Figure 6 Nuclear Reflectoscope Data Acquisition System

Figure 7 Sketch of Shell Weld Examination Technique

Figure 8 Sketch of Reactor Vessel Nozzle Radius Examination Technique

Figure 9 Sketch of Steam Generator Nozzle Radius Examination Technique

Figure 10 Sketch of Pressurizer Nozzle Radius Examination Technique

Figure 11 Sketch of Reactor Vessel Flange Ligament Examination Technique

Figure 12 Sketch of Reactor Vessel Flange Weld Examination Technique

Figure 13 Sketch of Reactor Vessel Nozzle Weld Examination Technique

Figure 14 Sketch of Closure Head Instrument Nozzle Weld Examination

Figure 15 Typical Calibration Standards

Figure 16 Precalibration of Reactor Vessel Examination Equipment

Figure 17 Search Unit Fixture for ID Examination of Reactor Vessel Shell Welds

Figure 18 ID Examination Fixture in Use

Figure 19 Search Unit Fixture for Examination of Reactor Vessel Nozzle Welds from Nozzle Bore

SUMMARY AND CONCLUSIONS

The major components of the Waterford 3 Steam Electric Station were subjected to a preservice examination between August 1975 and May 1976. The purpose of this preservice examination was to provide a reference for future inservice examinations and to fulfill the requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Paragraphs IWB-2100 and IWC-2100. All aspects of the program, including the selection of components and the examination procedures, were in accord with the Summer of 1974 Addenda to the 1974 Edition of Section XI.

The examinations of each component were carried out soon after the hydrotest in the fabrication shop of Combustion Engineering, who is the manufacturer of the components and the supplier of the NSSS. The examinations performed were volumetric, using manual and mechanized ultrasonic (UT) techniques, surface, using liquid penetrant (PT) techniques, and visual. The examinations were carried out by personnel from CONAM Inspection, Inc., a subsidiary of Automation Industries, using procedures developed by the Nuclear Energy Services Division of Automation Industries and approved by Combustion Engineering and Factory Mutual. Overall supervisory control of the program was supplied by personnel from the Nuclear Power Systems, Engineering Development and Services Department, and Systems Integrity Services Section, of Combustion Engineering. Operators of mechanical equipment also were supplied from the same department of Combustion Engineering.

The following summarizes the results of these examinations:

Volumetric

(1) Reactor Pressure Vessel

Seven (7) small reportable laminations and one (1) small reportable elliptical indication.

(2) Reactor Pressure Vessel Closure Head

No reportable indications.

(3) Steam Generators

There were reportable geometric indications in each unit, but no other reportable indications.

(4) Pressurizer

One small laminar indication.

Surface

The surface examinations performed on the various components disclosed minor indications such as porosity; these were reported on the data sheets for the examinations and were deemed acceptable by the examiners. On steam generator #2, the surface examinations disclosed unacceptable porosity and gouges on the support lugs on the secondary side. These areas were repaired under the supervision of the fabrication shop's Quality Assurance personnel, and these areas were rendered acceptable when subsequently submitted to further surface examinations.

Visual

The visual examinations also disclosed minor indications such as scratches and gouges. In all cases these were reported and considered acceptable.

All volumetric, surface, and visual indications were within the acceptance limits of the 1974 Edition of Section XI through the Summer of 1974 Addenda. The results are tabulated in Appendix 1 of this volume of the Preservice Examination Program and Report.'

Within the extent of the examinations done, the reactor pressure vessel and closure head, steam generators, and pressurizer of the Waterford 3 Steam Electric Station are acceptable for safe operation to Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

DISCUSSION

This section of the Shop Preservice Examination Program and Report consists of seven distinct areas as follows:

IV-A General

Presents general information concerning the Preservice Examination Program.

IV-B Equipment

Describes the type of equipment used.

IV-C UT Calibration Standards

Provides specific information relative to the UT calibration standards.

IV-D Examination Procedures

Contains a summarized description and listing of the examination procedures used during the conduct of the shop preservice examinations. The procedures themselves are contained in Volume 2 of the preservice examination program and report.

IV-E Evaluation Criteria

Presents a listing of applicable evaluation criteria.

IV-F General Examination Techniques

Briefly describes the examination techniques utilized.

IV-G Examination Details and Results

Provides details regarding indications found during the examinations. The actual data sheets for the examinations can be found in Volume 4, and the calibration sheets for the ultrasonic examinations can be found in Volume 5 of the preservice inspection program and report.

DISCUSSION

A. General

Section IV of this volume outlines the techniques, equipment, and results of the preservice examinations of the components of the Waterford 3 Steam Electric Station. The ultrasonic nondestructive testing was performed using manual and mechanized techniques; these techniques, as well as those used for visual and surface examinations, were in accordance with C-E/NES procedures which were designed to fulfill the intent of the 1974 Edition of Section XI of the ASME Boiler and Pressure Vessel Code, including Appendix I. Copies of the procedures comprise Volume 2 of the Preservice Examination Program and Report. The test data (calibration data and examination results) comprise Volumes 4 and 5 of the Preservice Examination Program and Report and are summarized herein in Appendix 1.

Examination personnel involved in this preservice examination were certified in accordance with established C-E/NES personnel certification procedures and with SNT-TC-1A, the American Society for Non-Destructive Testing document which deals with personnel certification. Copies of the personnel certification for each individual are contained herein as Appendix 3.

The report and data sections of the Shop Preservice Examination and Report is contained in Volumes 3, 4, and 5. This volume, Volume 3, contains the descriptive material concerning the summary of results, examination techniques, equipment, and the certifications of personnel and equipment. Specifically, Appendix 1 contains a listing of the results for a particular area of interest. In addition, Section IV-G of this volume contains a discussion of reportable indications in each examination area where found.

Volumes 4 and 5 contain the examination data sheets for each examination area. Volume 4 contains the scan data sheets which are arranged by component and further subdivided into convenient areas of reference, e.g., reactor vessel shell welds. Volume 5 contains the calibration data sheets for the ultrasonic examinations which are arranged in numerical order.

The following example is provided to illustrate the organization of this report.

Suppose one is interested in reviewing data for the examination of the attachment weld of the pressurizer safety nozzle at 225°. Appendix 1 discloses that this weld is numbered 05-013 and that examination data sheet numbers 242-2,6, and 7 reflect the examination results. In addition, a small lamination was discovered with the 0° beam. Page in Section IV-G of this volume summarizes the significant parameters of this indication. The scan data sheet and evaluation sheet for this weld are found in Volume 4 under Zone 5, Nozzle-to-Head Welds, Scan Sheet Number 242-2, Weld Number 05-013. The calibration data sheet is located in Volume 5 under Procedure NIP-242.

B. Equipment

1. Manual

The ultrasonic equipment used for the manual examinations were Model UJ Reflectoscopes manufactured by Automation Industries and Model 301 Sonoray units manufactured by Krautkramer-Branson. The search units (transducers and shoes, where used) were of varying types manufactured by Automation Industries, Panametrics and Aerotech Laboratories. Details of the particular instrument-search unit combination used to perform a specific examination can be found on the calibration data sheets included in Volume 5 of the Shop Preservice Inspection Program and Report. A listing of the specific transducers and instruments used for the examinations is provided in Table 1, contained in Appendix 2 of this volume of the report.

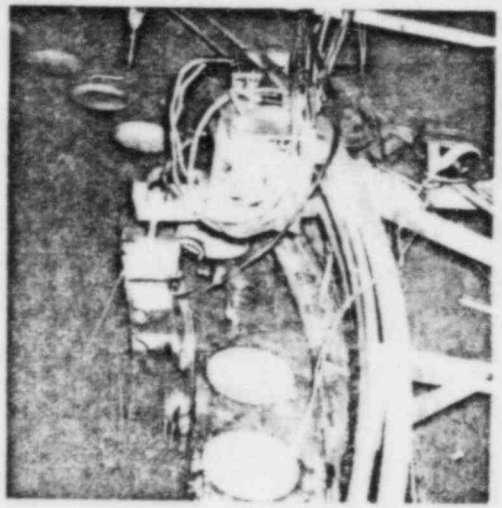
The ultrasonic couplant used for these examinations was Trim Regular, manufactured by the Master Chemical Corporation, Perrysburg, Ohio, and certification for this material will be found in Appendix 2 of this volume.

2. Mechanical

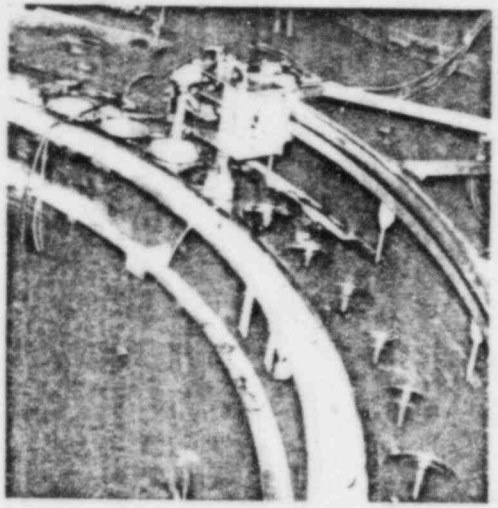
The flange-to-shell weld and the flange ligament areas of the reactor pressure vessel were examined from the top surface of the flange. Because of the high radiation in this area during any inservice examination, mechanized equipment was used for the preservice examination. A track was mounted on a frame that was concentric with and slightly larger than the stud hole circle. It was long enough to cover slightly more than one quadrant and was supported and located by alignment pins in stud holes beyond the examination area and by a trusswork extending away from the vessel: A carriage moved along the track carrying either a three-transducer search unit along the closure mating surface to examine the flange weld or a single-transducer search unit which could be rotated around each stud hole to examine the ligament areas. Photographs of this mechanism are shown in Figure 1.

The shell welds, nozzle-to-shell welds, and nozzle radius sections were examined by means of the PaR Model ISI-2 positioning device, shown in Figure 2. The device was mounted on the flange of the vessel and positioned the search unit fixtures within the vessel. An electric hoist atop the mast provided the vertical movement along the vessel centerline by actuating a multisection telescoping tube. An inspection boom was mounted at the bottom of the tube and could be rotated through 360° by means of an electric motor. The end of the boom could be extended outward by a hydraulic mechanism. At the end of the boom was a rotator upon which the various UT examination devices were mounted. In this way, complete flexibility of motion was provided to carry out the required Code examinations.

The control console of the PaR device contained digital readouts for the hoist, rotation and extension motions, and the control module for the rotator contained a digital readout for its rotational position. The control consoles for both devices are shown in Figures 3 and 4. The initial alignment of the device was provided by its mounting on three guide pins located in predetermined stud holes in the reactor pressure vessel flange. Reference locations on the reactor vessel shell which were used to locate the



Flange Weld Examination



Flange Ligament Examination

Figure 1 - Views of Reactor Vessel Flange Examination Device

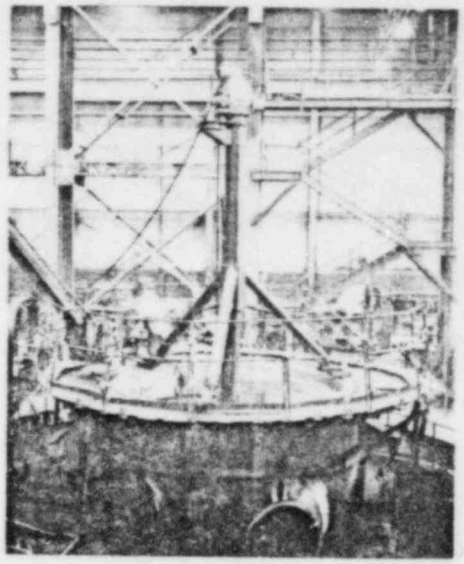


Figure 2
PaR Model ISI-2 Vessel
Examination Device

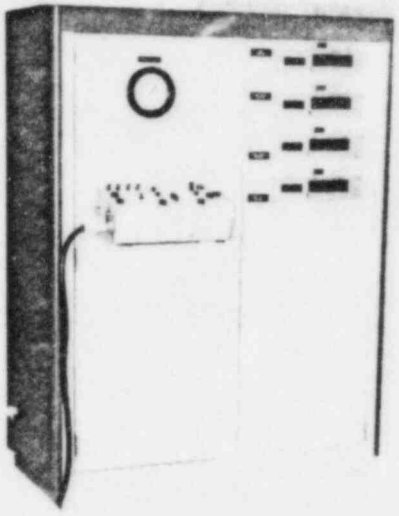


Figure 3
Control Console for
PaR Examination Tool

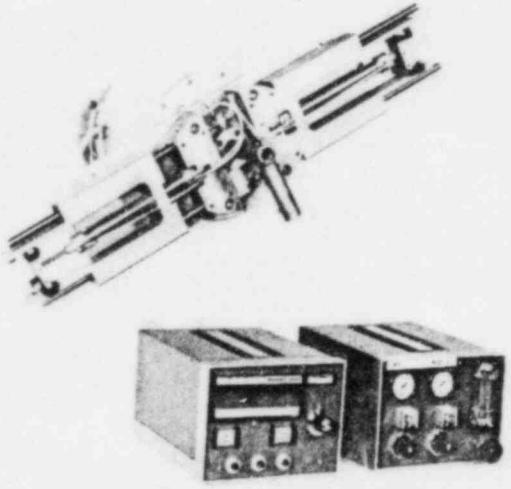


Figure 4
Nozzle Examination
Device and Control Consoles

Figure 5
Shell-Side Nozzle
Scanner in Operation

weld seams were provided by accurately located weld buildup index pads on the outside of the vessel, adjacent to the intersections of the longitudinal and circumferential welds and which were located ultrasonically. Details can be found in C-E Procedure 00000-NLE-061 and its appendix and data sheets, which are contained in Volume 2 of this Preservice Examination Program and Report.

The examination of the vessel nozzle-to-shell welds from the vessel ID was performed using the shell side nozzle scanner. This scanner was mounted on the end of the PaR boom and was aligned on each nozzle centerline by means of the PaR controls. It was rotated about the nozzle centerline by the rotator on the end of the PaR boom, and had an independent mechanism for radial motion which was controlled by the Nuclear Reflectoscope. Provision was also made for keeping the search units in contact with the vessel wall as the fixture was rotated around the compound curvature of the vessel ID. In this way flexibility of motion was provided to carry out the necessary examinations. A photograph of this device in operation is provided in Figure 5.

3. Automated Data Acquisition System

Both the flange examination device and the PaR device operated in conjunction with the Nuclear Reflectoscope, which is an instrument containing five multiplexed UT channels and common control, data acquisition, and printing systems; each channel can operate one UT transducer, meaning that up to five different transducers giving five different examinations can be run simultaneously. The channels are sequentially pulsed at a rate chosen in conjunction with the scan speed to give at least 25 percent overlap between pulses for each transducer, and all returning signals are examined. If an echo is observed, its amplitude is compared electronically with the calibration curve for the examination being performed. If the amplitude is a large enough fraction of the calibration curve (this fraction being set by the operator during the calibration), a printout is produced giving the coordinates of the fixture being used, the channel (and therefore the search unit) receiving the signal, and amplitude of the signal, and the approximate depth in the material from which the echo originated. The Nuclear Reflectoscope is shown in Figure 6. Incorporated into the unit is a cathode-ray screen which can be switched manually to display the signal seen by any of the channels. Details of the printout and its interpretation are contained in the introduction to Volume 4 of the Preservice Examination Program and Report.

4. Visual and Surface Examination Equipment

The visual examinations of the reactor vessel clad patches, snubber lugs and core stop lugs were performed using a closed-circuit television system. A specially equipped underwater television camera was mounted on a boom which pivots from the bottom of the PaR device mast and also rotates through the PaR device rotation mechanism. The examinations were recorded on video tape with appropriate audio commentary by the Level II visual examiner.

Visual examinations of areas on the closure head, steam generators and pressurizer were conducted using direct visual techniques. Resolution was proven by use of an 18% neutral gray card with a 1/32 inch line for both direct and remote visual techniques.

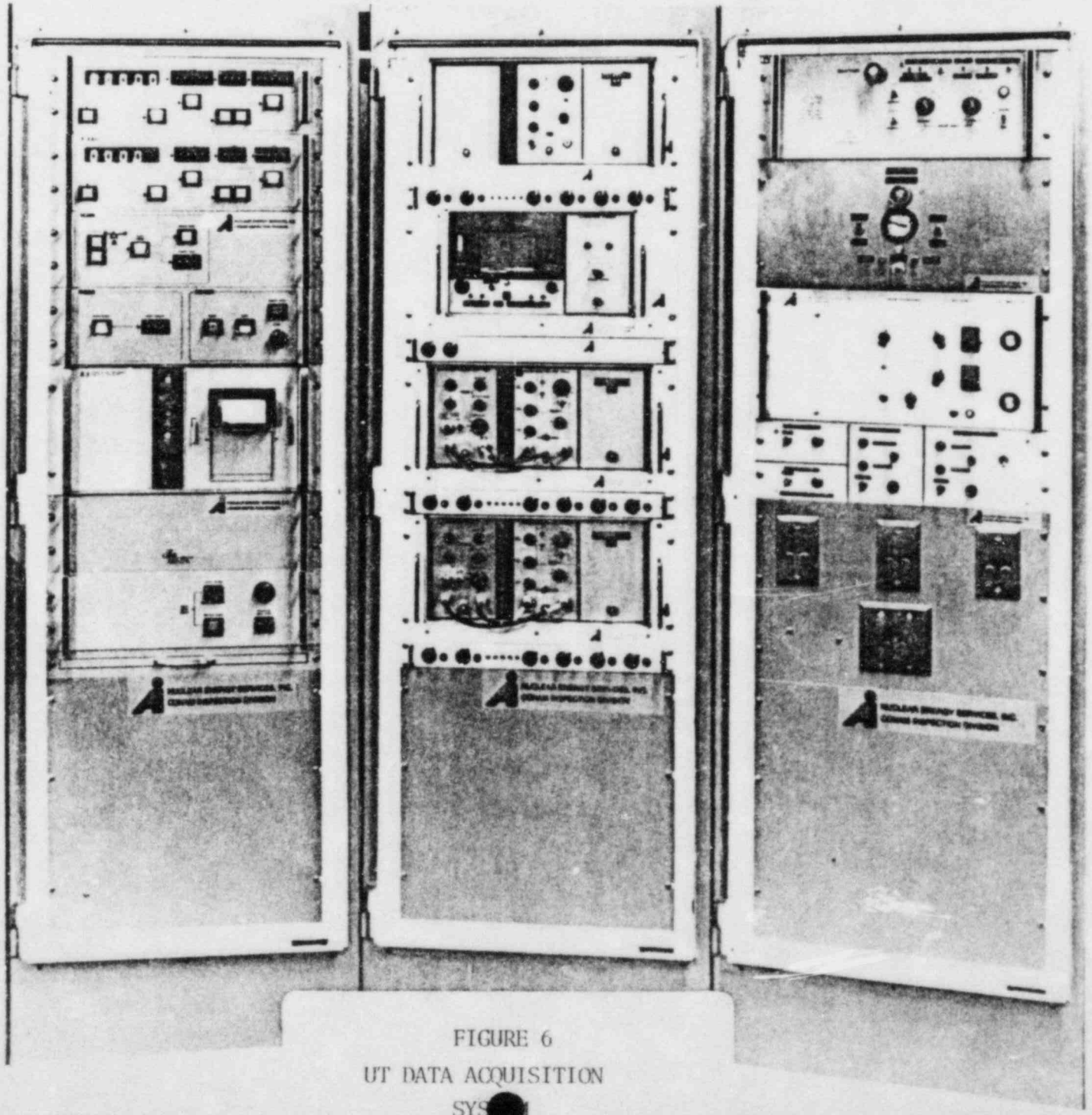


FIGURE 6

UT DATA ACQUISITION

SYS

Surface examinations were performed using liquid penetrant techniques. The material used was the Spotcheck brand manufactured by the Magnaflux Corporation. Certifications for the penetrant material will be found in Appendix 2 of this volume.

UT CALIBRATION STANDARDS

Calibration standards are required for use as reference standards when conducting ultrasonic examinations in order to assure standardization and repeatability of the essential test instrument parameters prior to the preservice and each recurring inservice examination. These standards have been fabricated to meet the requirements of Section XI, ASME Boiler and Pressure Vessel Code, Summer 1974 Addenda to the maximum extent possible. Drilled holes and notches have been provided to serve as calibration reflectors in order to establish a primary reference response of examination equipment. This information is used to establish the distance amplitude curve for ultrasonic pulse-echo response over the entire thickness being inspected.

The standard has been ultrasonically examined with a straight beam search unit to ensure that areas which contain indications that exceed the remaining back reflection have not been included in the required calibration beam paths. The standards have been fabricated from reactor vessel nozzle cutouts whereever possible. These standards were used for examination of the steam generators and the pressurizer as well as the reactor vessel. The 1974 Edition of the Section XI requires calibration standards to be manufactured from component prolongation or cutouts. This was not possible in all cases. This exception to Section XI is more fully explained in Section VI of Volume 1 of the Preservice Examination Program and Report. The material has been heat treated for a minimum time of two (2) hours at a temperature of 1150°F. Cladding has been provided on those standards where the applicable component part is clad. The surface finish of the calibration standard is representative of the surface finishes of the component.

The calibration standards were used for shop preservice examinations. After completion of those examinations, the standards became the property of the plant owner and will be stored at the plant site for use during subsequent inservice examinations. Each standard is identified by a stamped identification number. The material source code is also permanently stamped on the calibration standards.

A listing of all calibration standards used during the shop preservice examinations and calibration standard drawings have been included in this section.

UT CALIBRATION STANDARDS

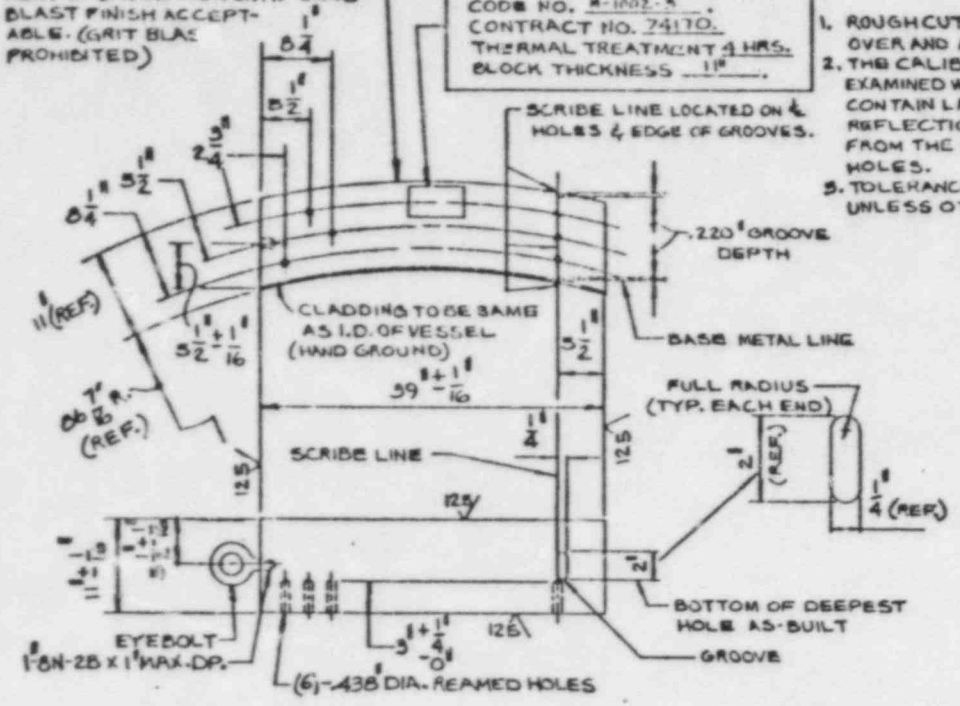
Block No.	Description	Drawing No.	Use
UT-1	11" thick	C-234-225-3	Reactor vessel upper shell
UT-2	9" thick	C-234-224-2	Reactor vessel middle and lower shells
UT-3	7" thick	C-234-223-2	Steam generator primary head, reactor vessle closure head
UT-4	5" thick	C-234-222-2	Pressurizer shell, reactor vessel bottom head
UT-5	3" thick	C-234-221-2	Pressurizer top and bottom heads
UT-7	3" thick unclad	C-246-410-1	Steam generator support skirt, pressurizer support skirt
UT-8	11" X 7" X 32"	C-245-375-3	Reactor vessel flange and ligament area
UT-9	11" X 22" X 33"	C-245-376-5	Reactor vessel inlet nozzle
UT-10	11" X 23" X 40"	C-245-377-6	Reactor vessel outlet nozzle
UT-11	12" X 11" X 17"	C-246-454-2	Steam generator nozzle inner radii
UT-12	14" X 33" dia., 120° segment	C-246-393-2	Pressurizer surge nozzle inner radius
UT-13	11" X 19" dia., 120° segment	C-246-395-3	Pressurizer spray nozzle inner radius
UT-14	7" X 19" dia., 120° segment	C-246-443-1	Pressurizer safety nozzle inner radius
UT-20	7" dia. X 36"	B-246-438-2	Reactor vessel closure stud
UT-21	10-9/16" dia. X 7-1/2" long	B-246-419-1	Reactor vessel closure nut
UT-22	5-9/16" OD X 15/32" thick X 12" long	C-245-5	losure head instrument nozzle
UT-37	7" thick unclad	C-246-5	n generator secondary side
UT-38	5" thick unclad	C-246-.	m generator secondary side

REVISED	1	ADDED GROOVE & BROKEN LINES & NOTE 4	ADDED EYE BOLT DET. 3-5-74 J.T.	2	(1), 2, 6) ADDED UT-1. THK 4-10-74 J.T.

THIS SURFACE TO BE FREE OF RUST & SCALE AND ROUGHNESS THAT WILL INTERFERE WITH MOVEMENT OF U.T. SEARCH UNIT. SAND BLAST FINISH ACCEPTABLE. (GRIT BLAST PROHIBITED)

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN. HIGH CHARACTERS.

U.T. CALIBRATION STD UT-1
CODE NO. M-1002-5.
CONTRACT NO. 74170.
THERMAL TREATMENT 4 HRS.
BLOCK THICKNESS 11".



UT CALIBRATION BLOCK

SCALE: NONE

NOTES:

1. ROUGH CUT TO SIZE, HEAT TREAT FOR FOUR (4) HOURS AT 1150° ± 25° F. OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.

MODIFIED 1" EYE BOLT
SCALE: 1 1/2" = 1'-0"

74170

UT CALIBRATION BLOCK FOR 11" THICKNESS

SCALE AS NOTED
DRAWN BY L. MEANS
TRACED BY
DATE 10-9-73
CHECKED BY
APPROVED

THIS DRAWING IS THE PROPERTY OF COMBUSTION ENGINEERING, INC. WINDSOR, CONN. AND IS NOT TO BE REPRODUCED OR USED TO FURNISH ANY INFORMATION FOR MAKING OF DRAWINGS OR APPARATUS EXCEPT WHERE PROVIDED FOR BY AGREEMENT WITH ENG. COMPANY

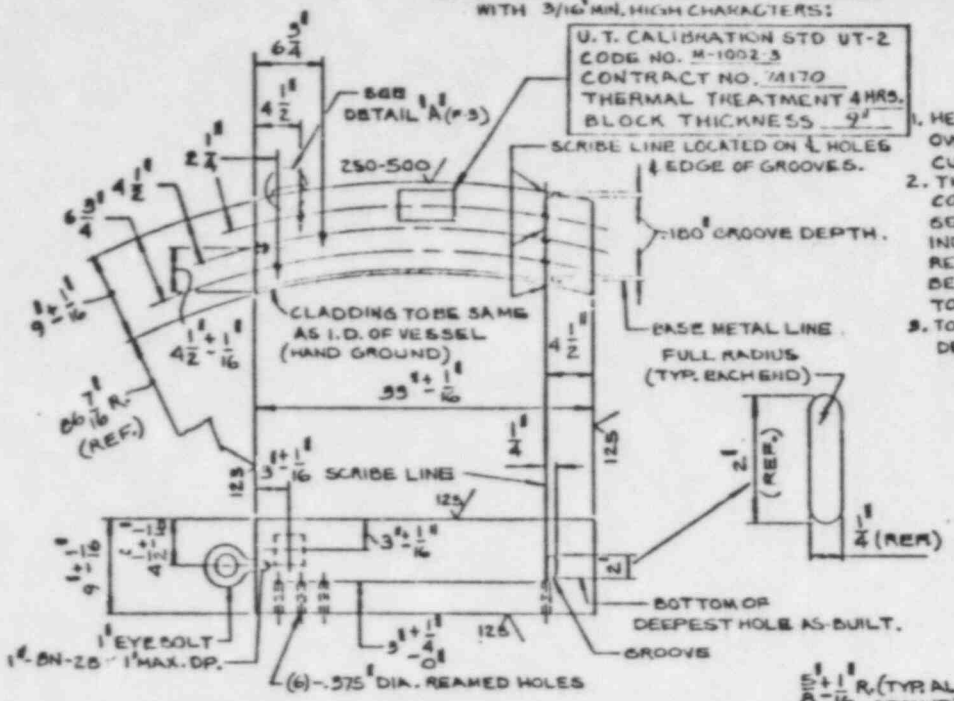
CONST. CODE

DRAWING NO. C-234-225-3

REVISED	1	[illegible]	2	(E-8) ADDED UT-2

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN. HIGH CHARACTERS:

U.T. CALIBRATION STD UT-2
CODE NO. M-1002-3
CONTRACT NO. 74170
THERMAL TREATMENT 4 HRS.
BLOCK THICKNESS 9"

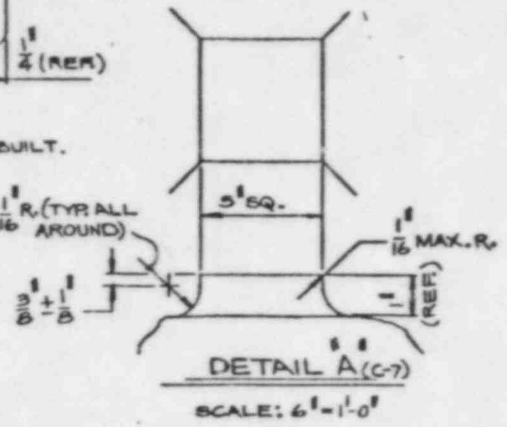


U.T. CALIBRATION BLOCK

SCALE: 1½"=1'-0"

NOTES

1. HEAT TREATMENT SHALL BE FOR (4) HOURS AT 1150°±25F. OVER & ABOVE PRESENT HEAT TREATMENT. ROUGH CUT TO SIZE, HEAT TREAT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.



DETAIL 'A' (C-7)

SCALE: 6"=1'-0"

74170

UT CALIBRATION BLOCK FOR 9" THICKNESS

SCALE AS SHOWN
DRAWN BY L. MEANS
TRACED BY
DATE 10-9-73
CHECKED BY [illegible]
APPROVED T. [illegible]

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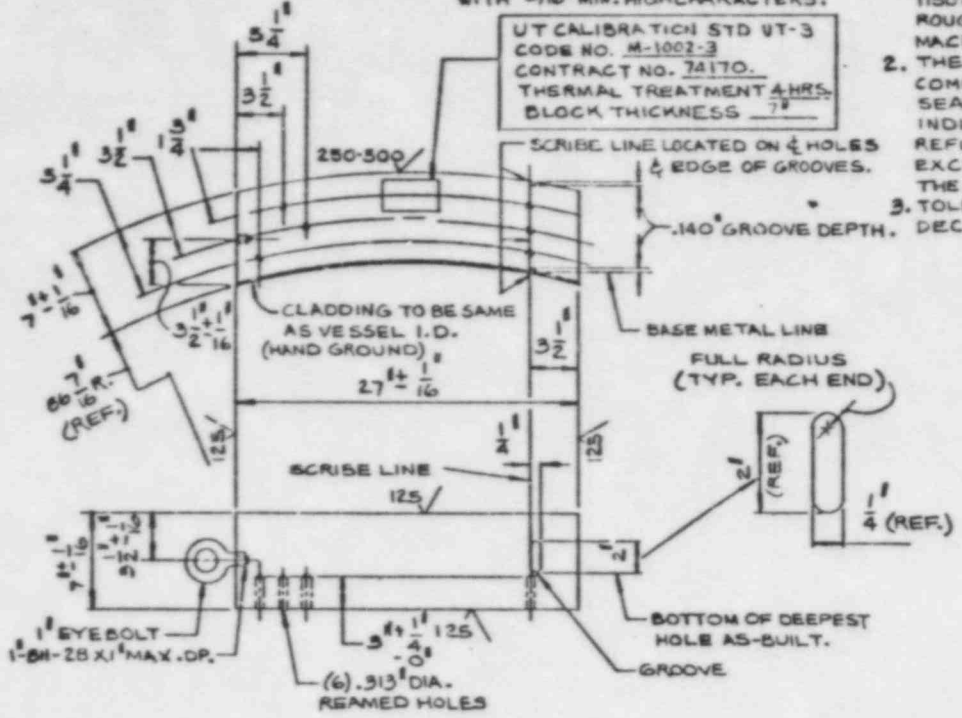
COMP. CODE

DRAWING NO. C-234-224-2

REVISED	1	MINOR CHANGES & SCRIBE LINES. PLANE. 11-29-73 J.A.	2	(D,E-7) ADDED UT-3 TWO 4-19-73

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN. HIGH CHARACTERS:

UT CALIBRATION STD UT-3
CODE NO. M-1002-3
CONTRACT NO. 74170.
THERMAL TREATMENT 4 HRS.
BLOCK THICKNESS 7"



UT CALIBRATION BLOCK

SCALE: NONE

NOTES

1. HEAT TREATMENT TIME SHALL BE FOUR (4) HOURS AT 1150°F. +25°F. OVER & ABOVE PRESENT HEAT TREATMENT. ROUGH CUT TO SIZE, HEAT TREAT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCES ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.

74170

UT CALIBRATION BLOCK
7" THICKNESS

SCALE AS NOTED
DRAWN BY L. MEANS
TRACED BY
DATE 10-9-73
CHECKED BY
APPROVED

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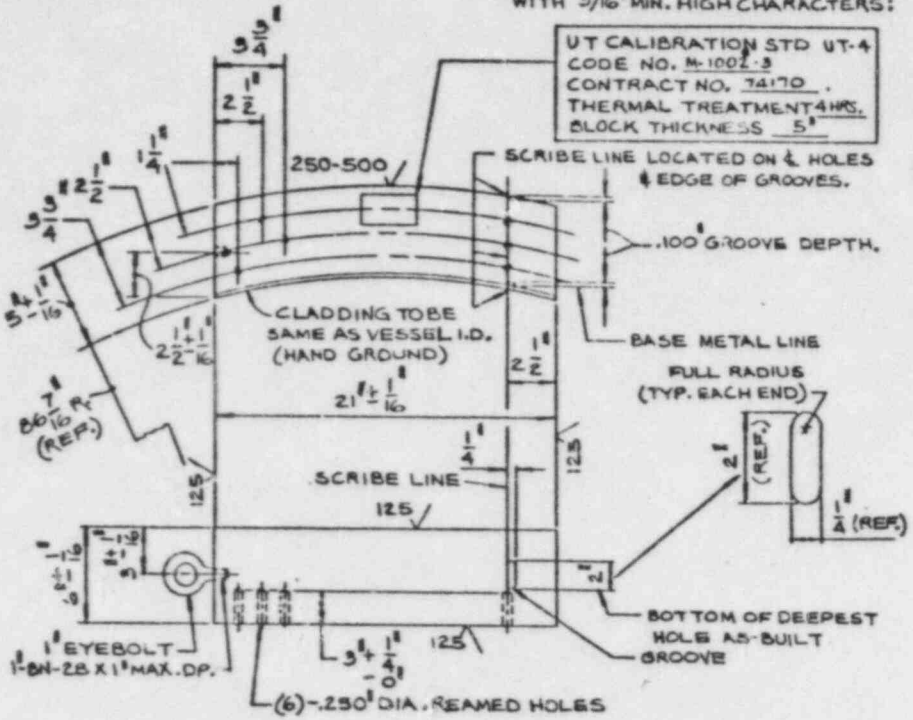
COMP CODE

DRAWING NO C-234-223-2

REVISED					
1	ADDED ASME SECTION V REQMTS. 11-29-73. J.F. M.T.	2	(T-7) ADDED UT-4 TMS 4-14-75 J.F. M.T.		

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN. HIGH CHARACTERS:

UT CALIBRATION STD UT-4
CODE NO. M-1002-3
CONTRACT NO. 74170
THERMAL TREATMENT 4 HRS.
BLOCK THICKNESS 5"



UT CALIBRATION BLOCK

SCALE: NONE

NOTES

1. HEAT TREATMENT TIME SHALL BE FOUR (4) HOURS AT 1150° ± 25°F. OVER AND ABOVE PRESENT HEAT TREATMENT. ROUGH CUT TO SIZE, HEAT TREAT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.

74170

FOR UT CALIBRATION BLOCK 5" THICKNESS

SCALE AS NOTED DATE 10-5-73
DRAWN BY L. MEANS CHECKED BY
TRACED BY APPROVED

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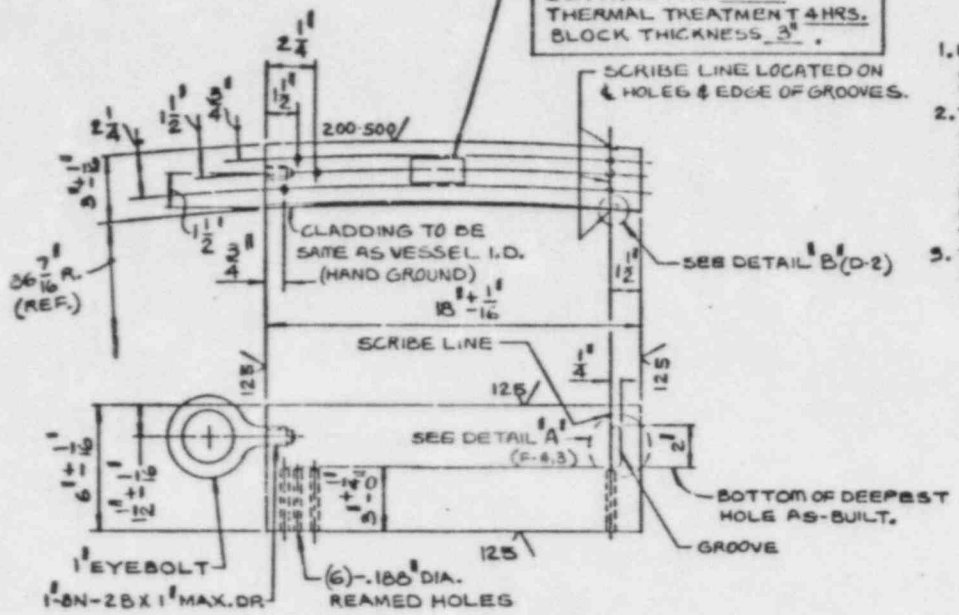
COMP. CODE

DRAWING NO C-234-222-Z

REVISED	01	DIM. 1 1/2 WAS 1 1/4 (B-6) PER REV. NOTE NO. 1	2	(E-7) ADDED UT-5 TM# 4-14-75	

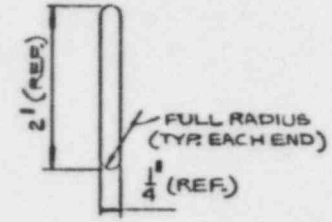
STEEL STAMP THE FOLLOWING INFORMATION IN 3/16" HIGH CHARACTERS:

UT CALIBRATION STD UT-5
CODE NO. M-1002-3
CONTRACT NO. 74170
THERMAL TREATMENT 4 HRS.
BLOCK THICKNESS 3" .



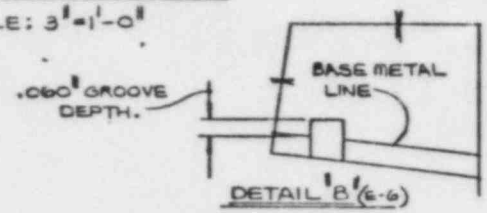
NOTES

1. HEAT TREATMENT TIME SHALL BE FOUR (4) HOURS AT 1150° ± 25°F. ROUGH CUT TO SIZE, HEAT TREAT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCES ON DIMENSIONS: FRACTIONS ± 1/64"; DECIMALS ± .010" UNLESS OTHERWISE NOTED.



DETAIL "A" (C-5)
SCALE: 12" = 1'-0"

UT CALIBRATION BLOCK
SCALE: 3" = 1'-0"



DETAIL "B" (G-6)
SCALE: NONE

74170

FOR UT CALIBRATION BLOCK 3" THICKNESS

SCALE AS NOTED	DATE 10-5-73
DRAWN BY MEANS	CHECKED BY [illegible]
TRACED BY	APPROVED [illegible]

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COMP. CODE

DRAWING NO. C-234-221-2

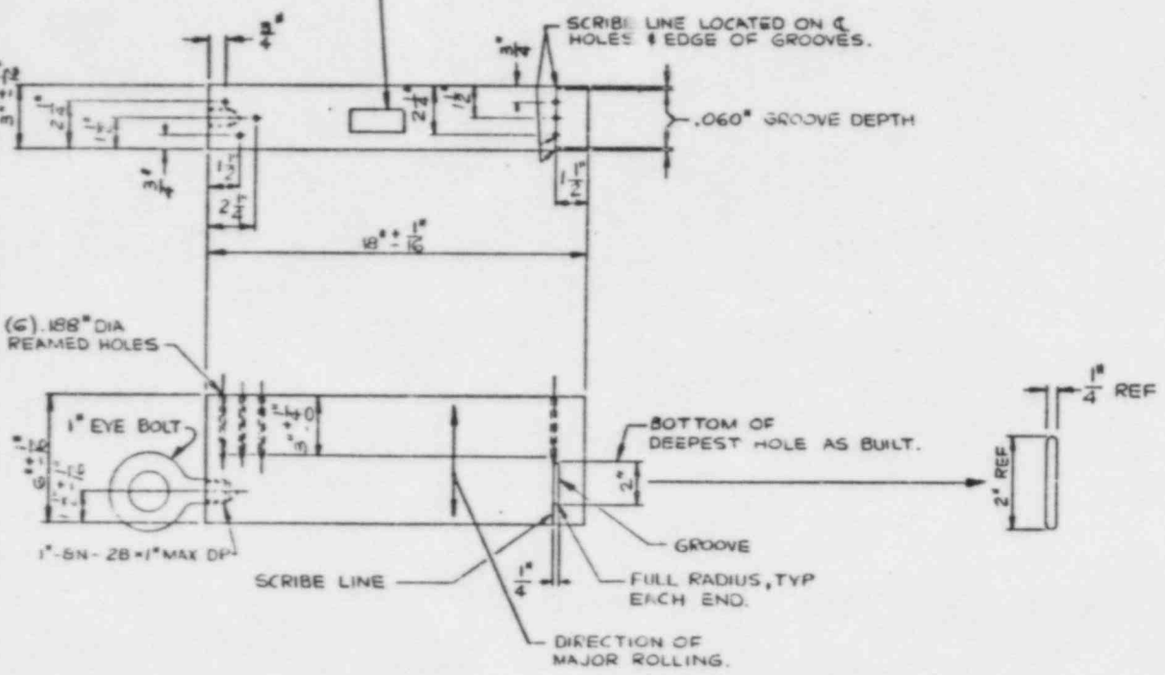
REVISED		ADDED UT-7 PER CHANGE NOTE #1. WM 3-12-75
	1	(6 H) 2 HRS WAS 4 HRS PER ALLOY CODE NO. 1 REMARK

NOTES:

1. ROUGH CUT TO SIZE. HEAT TREAT FOR TWO (2) HOURS MINIMUM AT 1150° ± 25° F° AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN HIGH CHARACTERS:

UT CALIBRATION STD UT-7
CODE NO. M-1002-2
CONTRACT NO - 74270
THERMAL TREATMENT - 2 HOURS
BLOCK THICKNESS - 3"



CONTRACT # 74270

UT CALIBRATION BLOCK UT-7
3" THICKNESS
FOR
WATERFORD III
STEAM GENERATOR

SCALE 3" = 1'-0" DATE 3-26-74
DRAWN BY J.C. GIMBER CHECKED BY S. McCOLLUM
TRACED BY APPROVED

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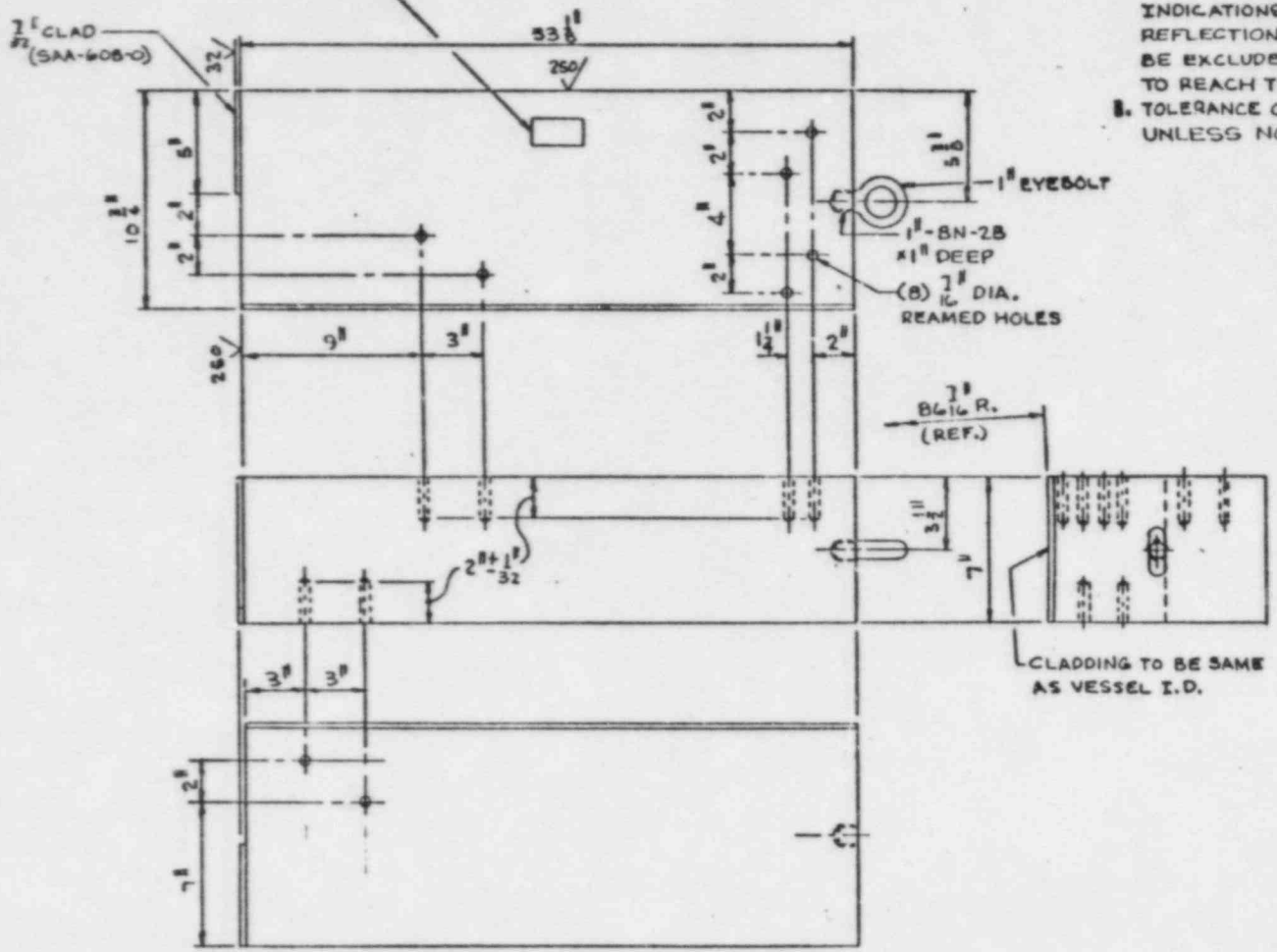
COMP CODE

DRAWING NO C-246-410-1

REVISED	1	ADDED 1" EYEBOLT (STEWART 3-13-74)	2	33 1/8" WAS 32 1/2" A.T. (STEWART 11-6-74)	3	(U-8) ADDED UT-8 THK 4-14-75 A.T.

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN. HIGH CHARACTERS.

U.T. CALIBRATION STD UT-8
CODE NO. M-1002-3
CONTRACT NO. 74170
THERMAL TREATMENT 4 HOURS



NOTES:

1. HEAT TREAT TIME SHALL BE FOUR (4) HOURS AT 1160° ± 25°F OVER AND ABOVE PRESENT HEAT TREATMENT. CUT TO SIZE, CLAD, HEAT TREAT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/16", UNLESS NOTED.

CONTRACT NO. 74170

U.T. CALIBRATION STANDARD
FLANGE & LIGAMENT AREA
FOR
WATERFORD III REACTOR VESSEL
COMPONENT CODE 91-0111-0001

SCALE 3" = 12" | DATE 1-3-74
DRAWN BY STEWART | CHECKED BY [illegible]
TRACED BY | APPROVED [illegible]

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COMP CODE

DRAWING NO C-245-375-B

REVISED	1	GEN. REV. J.S. SMITH 3-15-74 M.T.	2	REV NOTE #4 SMITH 5-7-74 M.T.	3	ADDED STANDARD UT-9 TO STEEL STAMP SMITH 6-17-74 M.T.	4	(C-4) 86 7/16" REF R WAS 86 1/2" R. ENG 4-14-75 ADDED MACHINED NOTCHES & SECTION A-A. J.F. M.T.

5 C-3 ADDED TWO (2) HOLES 1/4" DIA 4/29/76 R Sims T.M.S

NOTES:

1. CUT TO SIZE, CLAD, HEAT TREAT FOR FOUR (4) HOURS AT 1150°± 25°F. OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/16 UNLESS OTHERWISE NOTED.
4. CLADDING TO BE SAME AS VESSEL ID (HAND GROUND)

UT CALIBRATION STANDARD UT-9
CODE NO. M-1002-3
CONTRACT NO. 74170
THERMAL TREATMENT 4 HRS.

STAMP BLOCK AS SHOWN

DIRECTION OF MACHINE CLADDING

86 7/16" REF R

33 1/4"

10 3/4"

5 3/8"

1 1/4"-8UNC-2B - 1" MAX. DEEP (TYP)

7/32" NOM. CLAD

5 3/4" R.

42°

22 1/8"

10 1/2"

5 1/2"

11 7/8"

2 1/2" 2 1/2" 2 1/2" 1 1/2"

7/16" DIA DRILLED HOLES (9) NEAR SIDE

7/16" DIA DRILLED HOLES (5) FAR SIDE

2 1/2" 2 1/2" 2 1/2" 2 1/2" 1 1/2"

SAA-608-0

1/4" DIA HOLE FAR SIDE

1" "B"

2 1/4" +3/32 -0

2" +3/32 -0

3"

5"

"B" (F-1)

12"

13"

GMAA-600-0

MA-602-0

1 1/2" R.

"A"

4" +0 -1/16

20° TYP

2"

"A" (B-2)

42°05'± 0°30' TYP

3/8" DIA SPOTFACE

10 5/8" ± 1/16 TYP

SECTION "B-B" (C-2)
SCALE 12" = 12"

1 1/4"-8UNC-2A

1 1/8"

4 3/16"

1 1/4" MODIFIED EYE BOLT
SCALE: 6" = 1'-0"

BASE METAL

.215" ± .010"

.338" ± .010"

1 1/2" 1/8" 1/8" 1 1/2"

SECTION "A-A" (E-2)
SCALE 12" = 1'-0"

CONTRACT NO. 74170

REACTOR VESSEL INLET NOZZLE
CALIBRATION BLOCK
FOR
WATERFORD III REACTOR VESSEL
COMPONENT CODE 91-0111-0001

SCALE 3" = 1'-0" NOTED DATE 1-11-74
DRAWN BY G. SMITH CHECKED BY A.
TRACED BY APPROVED

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COMP CODE

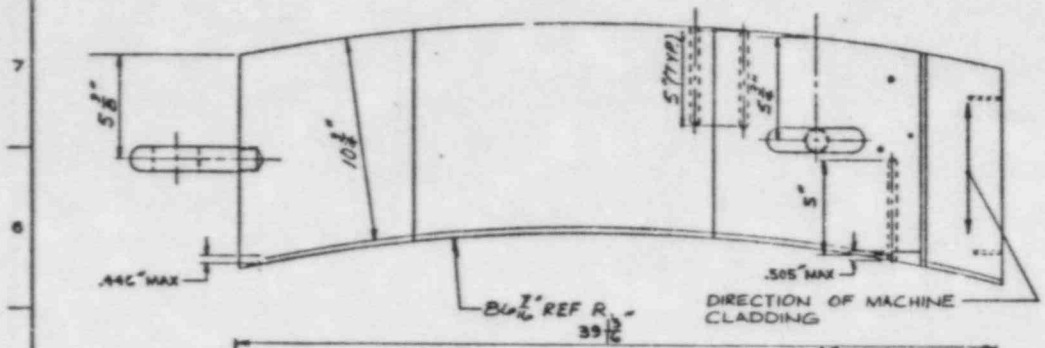
DRAWING NO C-245-376-5

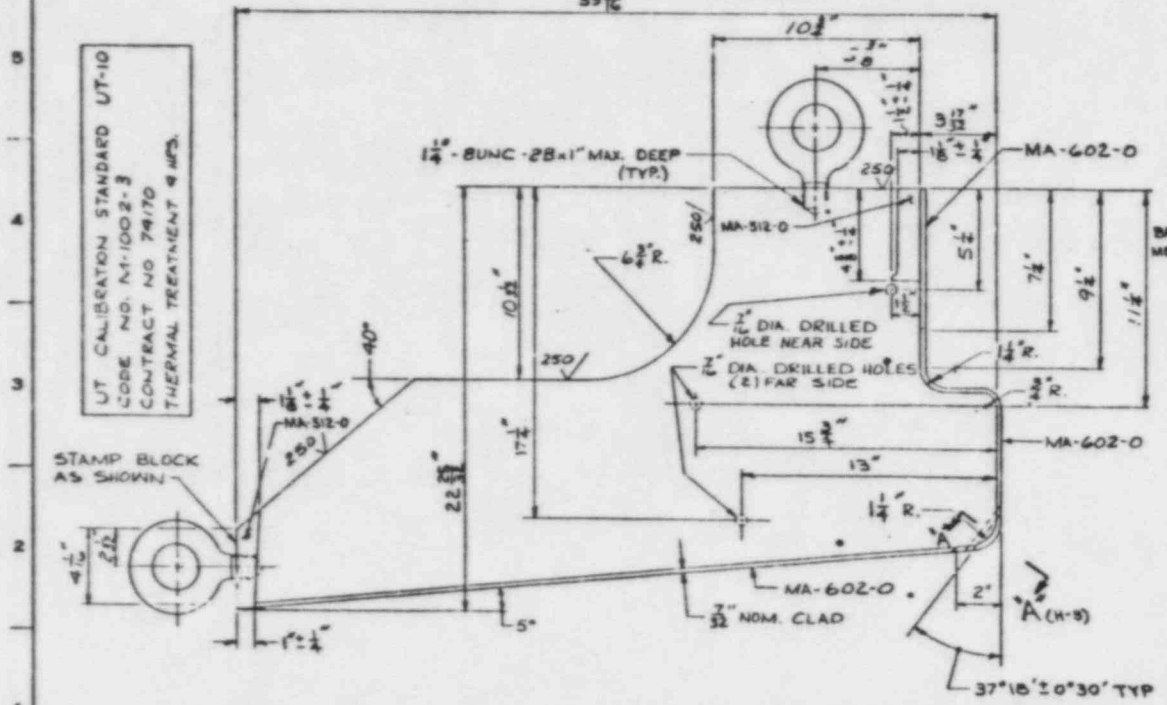
REVISED	1	GEN. REV. J.S. SMITH 3-13-74 M.T.	2	REV. NOTE J.S. SMITH 5-7-74 M.T.	3	ADDED STANDARD UT-10 TO STEEL STAMP SMITH 6-17-74 M.T.	4	GEN REV J.S. THIS 6-16-75 M.T.	5	GEN REV J.S. THIS 9-19-75 M.T.

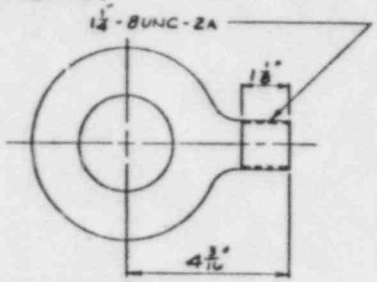
6 F-4 MA-602-0 WAS EXA-6008 REVISED PER ECN 2-19-76
D-2 MA-602-0 WAS GMAA-600-0 2-19-76

NOTES:

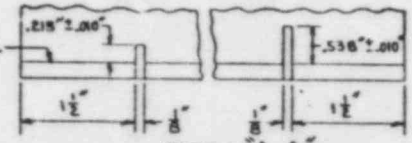
1. CUT TO SIZE, CLAD, HEAT TREAT FOR FOUR (4) HOURS AT 1150°±25°F. OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ±1/16" UNLESS OTHERWISE NOTED.
4. CLADDING TO BE SAME AS VESSEL ID (HAND GROUND)







1¼" MODIFIED EYE BOLT
SCALE 1 6" = 1'-0"



SECTION "A-A" (F-2)
SCALE 12" = 1'-0"

CONTRACT NO. 74170

REACTOR VESSEL OUTLET NOZZLE
CALIBRATION BLOCK
FOR
WATERFORD III REACTOR VESSEL
COMPONENT CODE 91-0111-0001

SCALE 3" = 1'-0" NOTED DATE 11-10-74
DRAWN BY G SMITH CHECKED BY
TRACED BY APPROVED

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COMP CODE

DRAWING NO. C-245-377-6

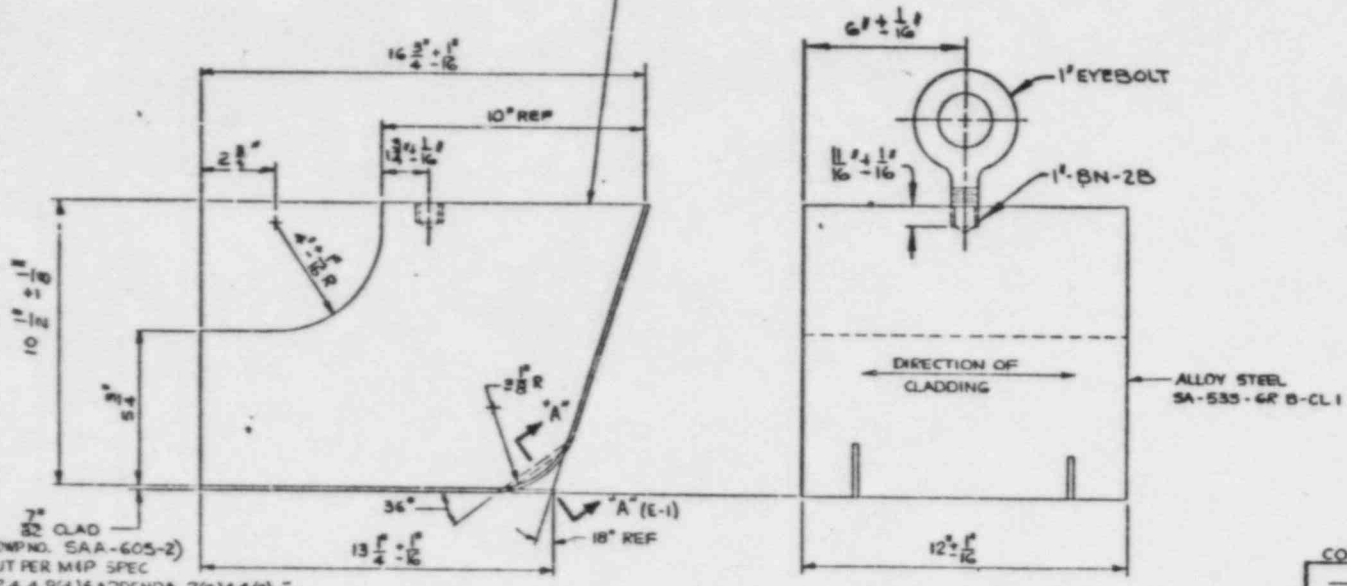
REVISED		
1	REVISED NOTE #1, ADDED "UT-11", ADDED CODE NO., (E-5) ADDED EYEBOLT (C-6) 2 HRS. WAS 4 HRS., ADDED SEC. "A-A", STEAMALL 3-6-75 JH CLEMONS/JCG	
2	(A-4) 10½" ± ⅛" WAS 10¾" ± 1/16". JHC/JCG REV. DWG # WAS GMAA-690-2. RJE 5-21-75	

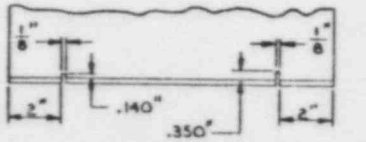
NOTES:

1. CUT TO SIZE, HEAT TREAT FOR TWO(2) HOURS MIN. AT 1150° ± 25° F OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010", ANGLES ± 0° 30' UNLESS OTHERWISE NOTED.

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN HIGH CHARACTERS:

UT CALIBRATION STD UT-11
CODE NO. M-1002-2
CONTRACT NO. 74270
THERMAL TREATMENT - 2 HOURS





SECTION "A-A" (C-1)

CONTRACT NO. 74270

UT CALIBRATION STD UT-11

FOR NOZZLE INNER RADIUS

WATERFORD III

STEAM GENERATOR

SCALE .4" = 1'-0" DATE 8-12-74

DRAWN BY J.C. GIMBER CHECKED BY J.S. CLEMONS

TRACED BY APPROVED R.E. Hill

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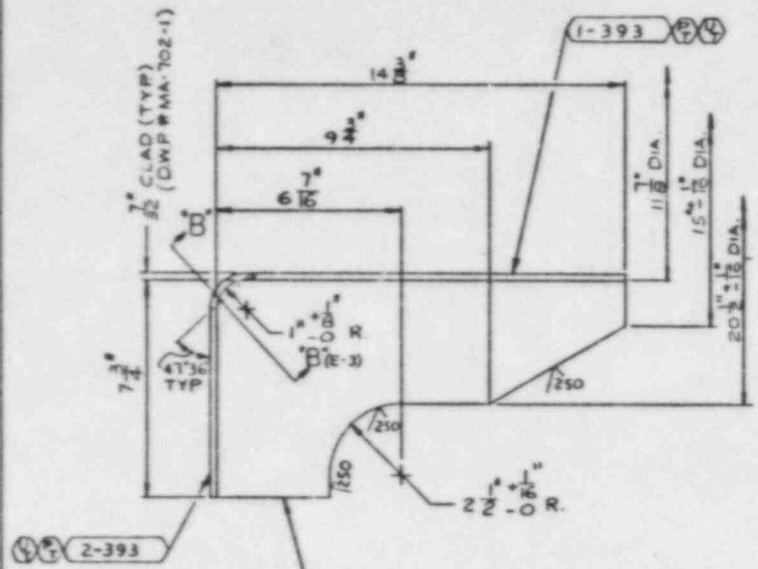
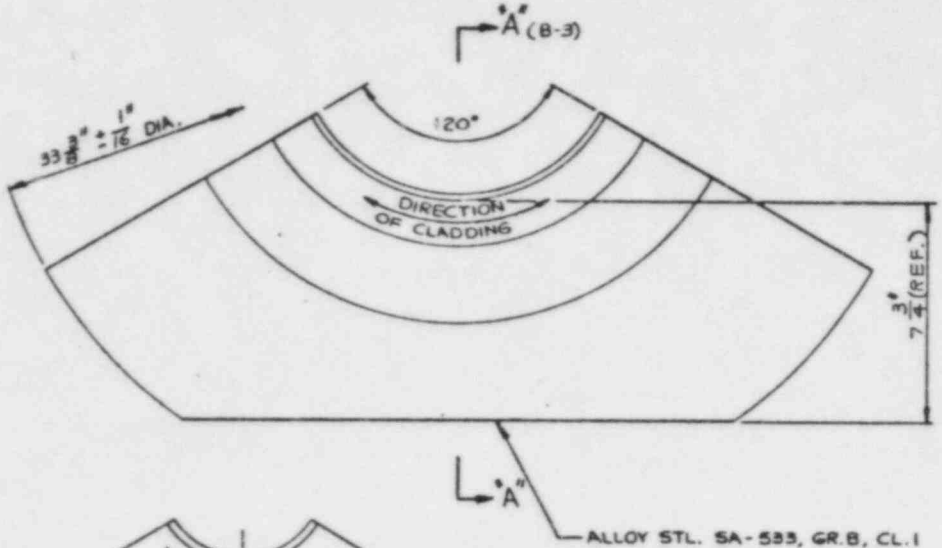
COMP. CODE

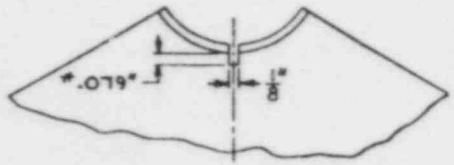
DRAWING NO. C-246-454-2

REVISED		
1	GENERAL REVISION (3)(B-6) ADDED NOTCHES, O. SNEED 7-22-74 ADDED SECTION "B-B"	



SECTION "A-A" (F-7)





SECTION "B-B" (B-6)
SCALE NONE

*NOTE: NOTCH DEPTH IS BASE METAL; CLAD THICKNESS IS NOT INCLUDED.

WELD NO.	DWP NO.	NO.	PT FREQ	NO.	MT FREQ	NO.	RT FREQ	NO.	UT FREQ	*F CVN
2-393	MA-702-1	10	F					13	F	
1-393	MA-605 Q	10	F					13	F	

WELD TABLE

NOTES

1. CUT TO SIZE, CLAD, HEAT TREAT FOR TWO (2) HOURS MIN AT 1150° ± 25° F. OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010", ANGLES ± 0° 30' UNLESS OTHERWISE NOTED.
4. CLADDING FINISH TO BE SAME AS VESSEL.

CONTRACT NO. 74370

U.T. CALIBRATION STD. U.T.-12
SURGE NOZZLE INNER RADIUS
FOR
WATERFORD III
96" I.D. PRESSURIZER

SCALE 4" = 1'-0" | DATE 3-15-74
DRAWN BY J.C. GIMBER | CHECKED BY G. McCOLLUM
TRACED BY | APPROVED

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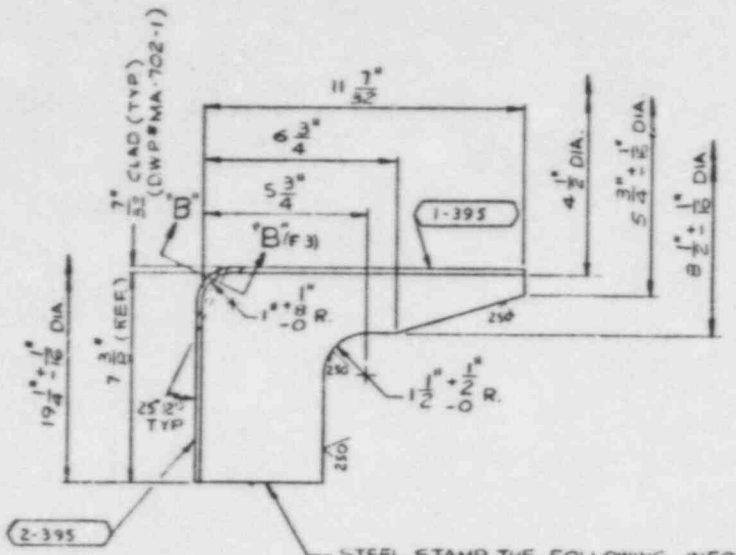
COMP. CODE

DRAWING NO. C-246-393-2

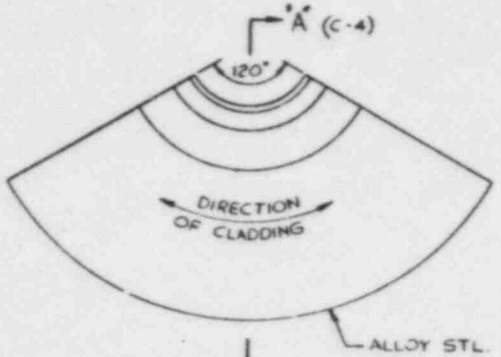
REVISED	1 GENERAL REVISION D SNEED 1-22-74	2 (B.) ADDED NOTCHES. ADDED SECTION "B-B"	3 1) CHANGED LOCATION OF 4 ½" DIA. D SNEED

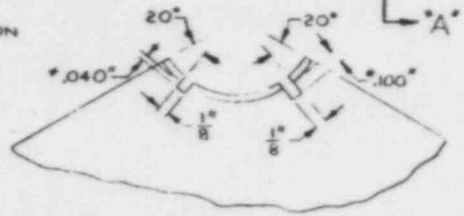


STEEL STAMP THE FOLLOWING INFORMATION WITH 1/8" MIN. HIGH CHARACTERS:

U.T. CALIBRATION STD. U.T.-13
CODE NO. M-100 2-3
CONTRACT NO. - 74370
THERMAL TREATMENT - 2 HOURS

SECTION "A-A" (F-7)





SECTION "B-B" (B-6)
SCALE NONE

* NOTE: NOTCH DEPTHS ARE BASE METAL; CLAD THICKNESS IS NOT INCLUDED.

WELD NO.	DWP NO.	PT NO.	PT FREQ	MT NO	MT FREQ	RT NO.	RT FREQ	UT NO.	UT FREQ	* CHK
2-395	MA-702-1	10	F					13	F	
1-395	VA-605-0	10	F					13	F	1

WELD TABLE

NOTES:

1. CUT TO SIZE, HEAT TREAT FOR TWO (2) HOURS MIN. AT 1150° ± 25° F OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010", ANGLES ± 0°30' UNLESS OTHERWISE NOTED.
4. CLADDING FINISH TO BE SAME AS VESSEL.

CONTRACT NO. 74370

UT. CALIBRATION STD. U.T.-13
SPRAY NOZZLE INNER RADIUS
FOR
WATERFORD III
96" I.D. PRESSURIZER

SCALE 4" = 1'-0" DATE 3-18-74
DRAWN BY J.C. GIMBER CHECKED BY G. MCCOLLUM
TRACED BY APPROVED

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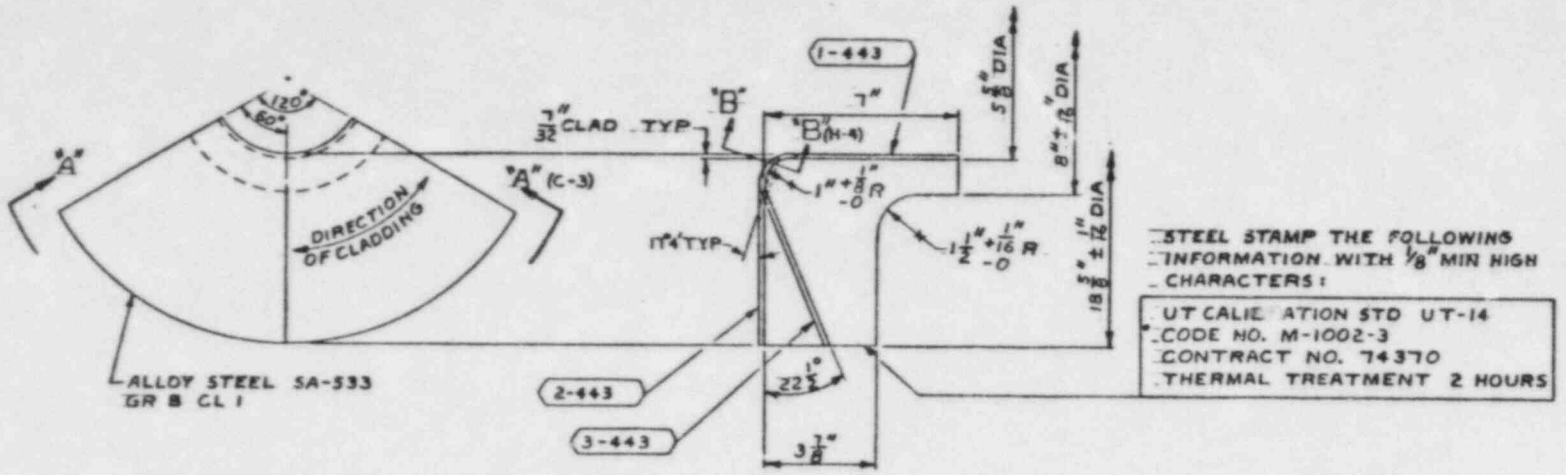
COMP CODE

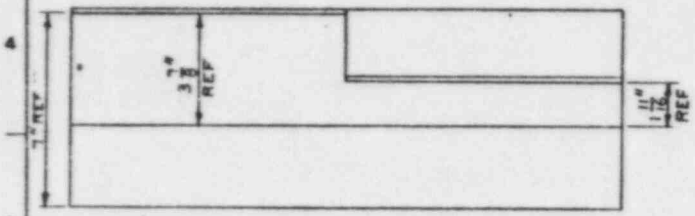
DRAWING NO C-246-395-3

REVISED 1 (D-7) ADDED NOTCHES. ADDED SECTION "B-B".

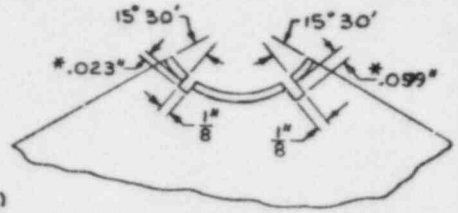


STEEL STAMP THE FOLLOWING INFORMATION WITH 1/8" MIN HIGH CHARACTERS:

- UT CALIBRATION STD UT-14
- CODE NO. M-1002-3
- CONTRACT NO. 74370
- THERMAL TREATMENT 2 HOURS



DEVELOPED VIEW "A-A" (C-7)



SECTION "B-B" (D-7)

SCALE NONE

*NOTE: NOTCH DEPTHS ARE BASE METAL; CLAD THICKNESS IS NOT INCLUDED.

NOTES

1. ROUGH CUT TO SIZE, CLAD, HEAT TREAT FOR TWO (2) HOURS MIN AT 1150° ± 25° OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64" DECIMALS ± .010", ANGLES ± 0° 30' UNLESS OTHERWISE NOTED.
4. FINISH ON CLADDING TO BE SAME AS ON VESSEL NOZZLE.
5. SEE DRAWING # B-74370-662-002 FOR NDT ITEM NO. IN WELD TABLE & NDT CALL-OUT ON DRAWING.

WELD NO.	DWP NO.	PT NO.	PT FREQ	MT NO.	MT FREQ	RT NO.	RT FREQ	UT NO.	UT FREQ	*S CHEM
3-443	MA-603-1	10	F					13	F	1
2-443	MA-603-1	10	F					13	F	1
1-443	MA-603-1	10	F					13	F	1

WELD TABLE

CONTRACT NO. 74370

UT CALIBRATION STD UT-14

SAFETY NOZZLE INNER RADIUS

FOR

WATERFORD III

96" ID PRESSURIZER

SCALE 3" = 1'-0" DATE 7-23-74

DRAWN BY D.E. SNEED CHECKED BY N. OCON

TRACED BY APPROVED [signature] 9-11-74

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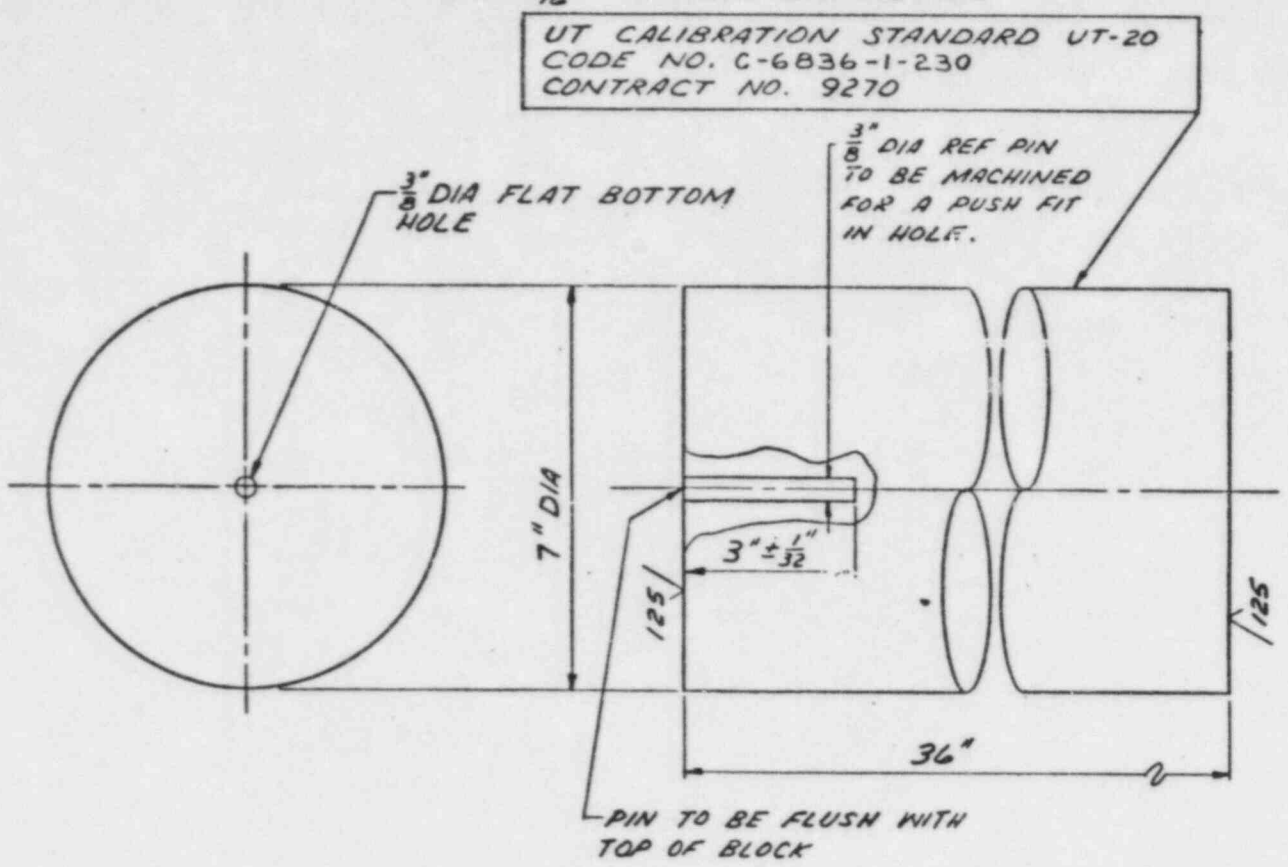
COMP CODE

DRAWING NO. C-246-443-1

REVISIONS	1	ADDED NOTE #4, ADDED PIN NOTES SMITH 9-9-74 J.A. M.T. 9-20-74	2	REV CODE NO. T.M.S 2-12-75 J.A. M.T. 2-20-75

STEEL STAMP THE FOLLOWING INFORMATION WITH $\frac{3}{16}$" MIN HIGH CHARACTERS

UT CALIBRATION STANDARD UT-20
CODE NO. C-6836-1-230
CONTRACT NO. 9270



NOTES

1. TOLERANCE ON ALL DIMENSIONS IS ± $\frac{1}{16}$" UNLESS OTHERWISE NOTED.
2. MT IN ACCORDANCE WITH M&P 2.4.2.5(b) AND ADDENDA 1(a), 2(a) & 3(a).
3. ALL SURFACES TO BE 250 AA OR BETTER UNLESS OTHERWISE NOTED.
4. UT IN ACCORDANCE WITH M&P SPEC 2.4.4.29(c) AND ADDENDUM 1(a).

CONTRACT NO. 74170

UT STUD CALIBRATION BLOCK
FOR
WATERFORD III REACTOR VESSEL
COMPONENT CODE NO. 91-0111-0001

SCALE 6" = 1'-0" DATE 6-5-74
DRAWN BY G. SMITH CHECKED BY J. ANDERSEN
TRACED BY APPROVED M. TURNMIRE

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COMP CODE

DRAWING NO B-246-438-2

E-32692

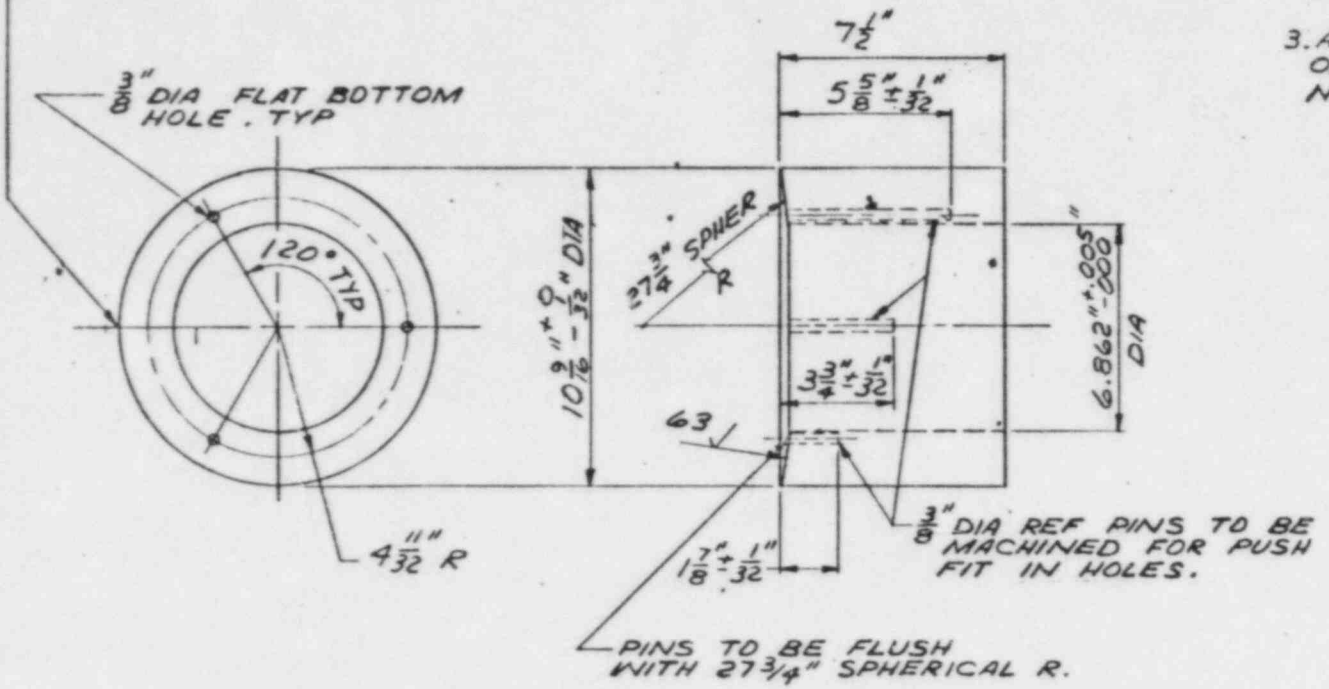
REVISIONS	1	ADDED UT-21 SMITH 6-3-74

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN. HIGH CHARACTERS

UT CALIBRATION STANDARD UT-21
CODE NO. M1029
CONTRACT NO. 9270

NOTES

1. TOLERANCE ON ALL DIMENSIONS IS ± 1/16", UNLESS OTHERWISE NOTED.
2. MT IN ACCORDANCE WITH M&P 2.4.2.5(b) AND ADDENDA 1(a), 2(a) & 3(a).
3. ALL SURFACES TO BE 250 AA OR BETTER UNLESS OTHERWISE NOTED.



CONTRACT NO. 74170

UT NUT CALIBRATION BLOCK
FOR WATERFORD III REACTOR VESSEL
COMPONENT CODE NO. 91-011-0001

SCALE 3" = 1'-0" DATE 4-4-74
DRAWN BY G. SMITH CHECKED BY J.K. Amos
TRACED BY APPROVED M.B. Turnage

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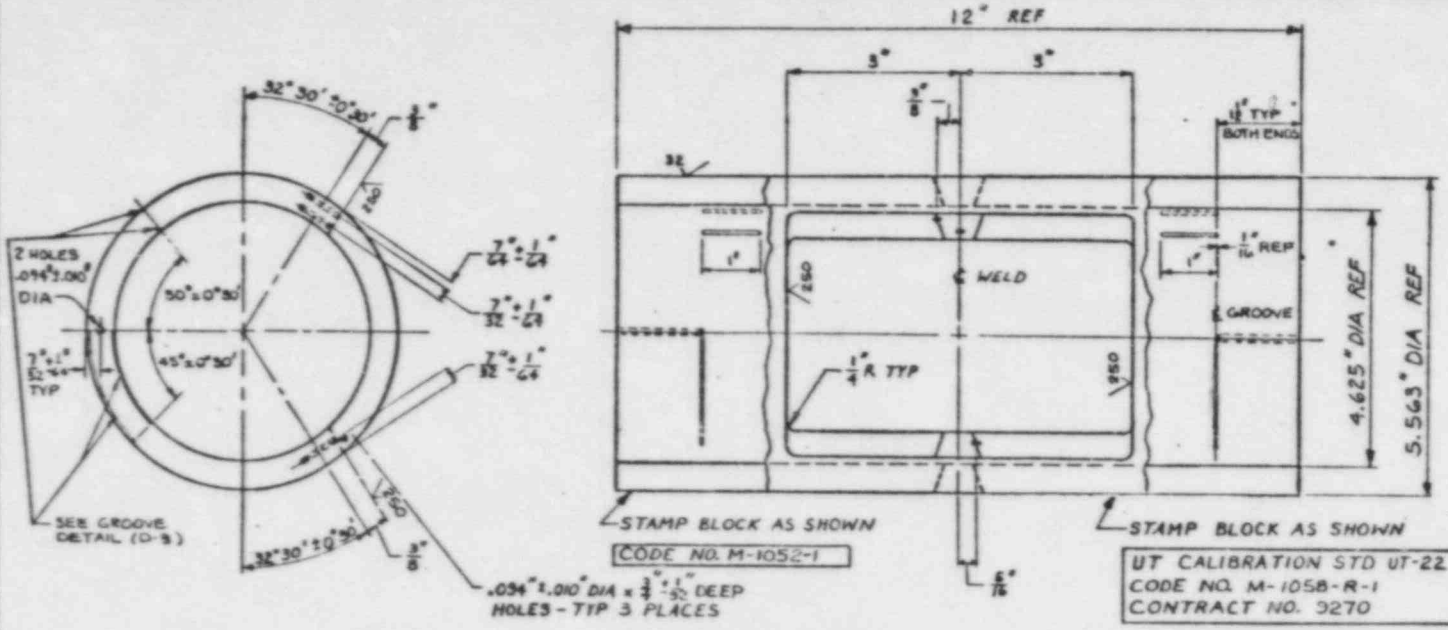
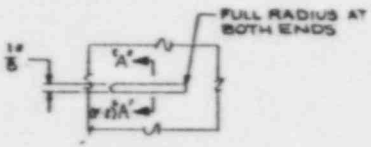
COMP CODE

DRAWING NO. B-246-419-1

C-245-570

REVISED			
1	ADDED CODE NO. M-1058-R-1; ADDED SURFACE FINISH ON CUT OUT; ADDED GROOVES	LARRY REDMAN 6-20-75	
2	ADDED 3 HOLES .344" ± .010" DIA AND ⅜" ± ⅛" TYP	JAS 2-18-76	





GROOVE DETAIL (A-5)
TYP 8 PLACES

SECTION "A-A" (D-3)

GENERAL NOTES

1. TOLERANCE ON ALL DIMENSIONS IS ± 1/32" UNLESS OTHERWISE NOTED.
2. ALL SURFACES TO BE 125AA OR BETTER UNLESS OTHERWISE NOTED.

CONTRACT 74170

INSTRUMENT NOZZLE CALIBRATION BLOCK

FOR WATERFORD III REACTOR VESSEL

COMPONENT CODE NO. 31-0111-0001

SCALE NONE DATE 8-27-74

DRAWN BY B.J. PRESLEY CHECKED BY T. McDOWELL

TRACED BY APPROVED M.T.

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COMP CODE

DRAWING NO. C-245-570 2

C-246-528

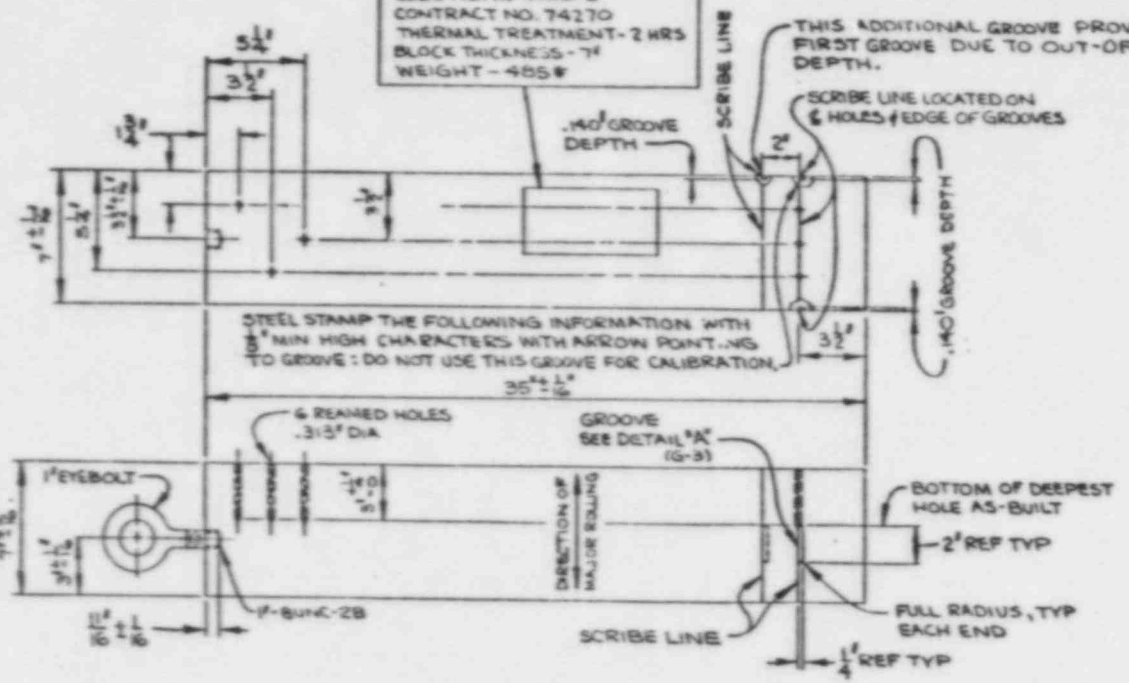
REVISED		
1	(A-3) 3" WAS 1.41", 3" WAS 5½" JEC (C-6) ADDED WEIGHT. DEC 7-3-95	
2	(D-3) ADDED GROOVE. (B-2) 1"-8UNC-2B WAS 1"-8N-2B (C-6) ADDED CODE NO. DAC 4-8-98 JEC FSH	

NOTES

1. ROUGH CUT TO SIZE, HEAT TREAT FOR TWO (2) HOURS MINIMUM AT 1150° ± 25° F OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.
4. MATERIAL TO BE ALLOY STEEL SA-533, GR B, CL 1.

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN HIGH CHARACTERS:

UT CALIBRATION STD UT-37
CODE NO. M-4708-2
CONTRACT NO. 74270
THERMAL TREATMENT - 2 HRS
BLOCK THICKNESS - 7"
WEIGHT - 485#



DETAIL "A" (D-3)
TYP 3 PLACES
SCALE 12"×12"

CONTRACT NO. 74270

UT CALIBRATION BLOCK UT-37
7" THICKNESS
FOR WATERFORD III
STEAM GENERATOR

SCALE 3"×12" DATE 3-12-95
DRAWN BY D.R. CROSS CHECKED BY J.K. LEMONS
TRACED BY APPROVED F.B. HILL

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DRAWING NO C-246-528-2

C-246-529

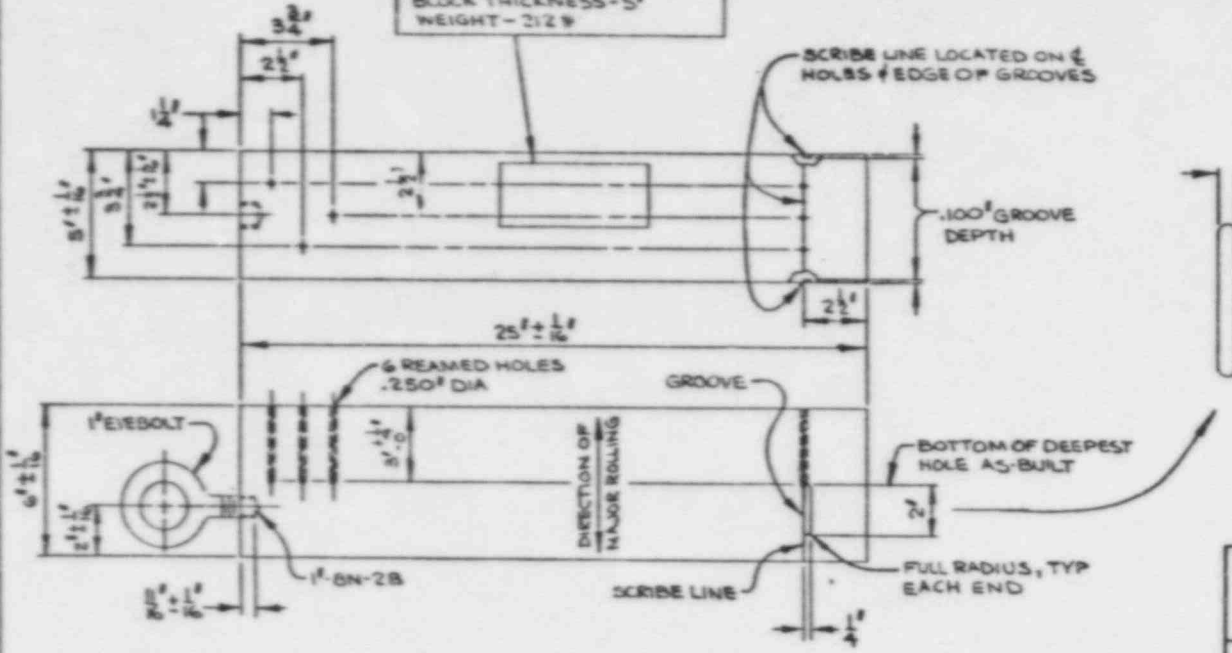
REVISED		
	1	(A-3) 6" WAS 10", 3" WAS 8"; (C-4) ADDED WEIGHT, DRL TO 1/16"

NOTES

1. ROUGH CUT TO SIZE, HEAT TREAT FOR TWO (2) HOURS MINIMUM AT 1150° ± 25° F OVER AND ABOVE PRESENT HEAT TREATMENT AND FINAL MACHINE.
2. THE CALIBRATION BLOCK MATERIAL SHALL BE COMPLETELY EXAMINED WITH A STRAIGHT BEAM SEARCH UNIT. AREAS WHICH CONTAIN LAMINAR INDICATIONS EXCEEDING THE REMAINING BACK REFLECTION AT THE INDICATION POSITION SHALL BE EXCLUDED FROM THE BEAM PATHS NEEDED TO REACH THE VARIOUS CALIBRATION HOLES.
3. TOLERANCE ON DIMENSIONS: FRACTIONS ± 1/64", DECIMALS ± .010" UNLESS OTHERWISE NOTED.
4. MATERIAL TO BE ALLOY STEEL SA-533, GR B, CL 1.

STEEL STAMP THE FOLLOWING INFORMATION WITH 3/16" MIN HIGH CHARACTERS:

UT CALIBRATION STD UT-3B
CODE NO.
CONTRACT NO. 74270
THERMAL TREATMENT - 2 HRS
BLOCK THICKNESS - 5"
WEIGHT - 212 #



CONTRACT NO. 74270

UT CALIBRATION BLOCK UT-3B
5" THICKNESS
FOR
WATERFORD III
STEAM GENERATOR

SCALE 4"=1'-0" DATE 3-13-75
DRAWN BY D.R.CROSS CHECKED BY J.K. CLEMONS
TRACED BY APPROVED F.F. HILL

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DRAWING NO C-246-529-1

EXAMINATION PROCEDURES

The Louisiana Power and Light Waterford 3 Steam Electric Station Preservice Examination Program is based upon meeting the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition, to the maximum extent possible. Paragraph IWA-1400 of the Code requires the preparation of written procedures necessary for the conduct of the nondestructive examinations associated with the program. Accordingly, written procedures were prepared for the conduct of nondestructive examinations. The procedures were approved by the plant owner (LP&L), his Authorized Inspection agency (Factory Mutual), and the inservice inspection contractor (C-E/Aii).

Volumetric examinations were performed using ultrasonic methods. The procedures prepared for the examinations comply with Appendix I of the 1974 Edition of Section XI. All procedures will be retained by Louisiana Power and Light and will be retained for use on subsequent inservice examinations. During the performance of the examinations, it was found necessary to make revisions to some procedures to reflect as-built conditions. These revisions were made and recorded using acceptable quality assurance practices.

A standard format was employed during the preparation of all volumetric procedures. A typical outline has been included in this section to acquaint the user with the structure, organization, and content of the procedures.

A table is contained in this section which gives a complete listing of all volumetric examination procedures required to perform the shop preservice examinations associated with the Louisiana Power and Light Waterford 3 Steam Electric Station; included in the table is a listing of the latest revision number for each procedure, showing the revision to which the examinations were performed. A second table lists all other procedures used in the examinations.

The examination procedures are contained in Volume 2 of this program.

UT PROCEDURE OUTLINE

1.0 SCOPE

- 1.1 Area of Examination
- 1.2 Type of Examination
- 1.3 Time of Examination
- 1.4 Weld Configuration
- 1.5 Materials

2.0 REFERENCES

- 2.1 Reference Documents
- 2.2 Applicable Drawings
- 2.3 Operational Manuals

3.0 PROCEDURE CERTIFICATION

4.0 PERSONNEL CERTIFICATION

- 4.1 Personnel Certification Requirements
- 4.2 Personnel Records

5.0 EXAMINATION REQUIREMENTS

- 5.1 Examination Frequency
- 5.2 Examination Angles
- 5.3 Liquid Couplant
- 5.4 Surface Preparation
- 5.5 Weld Identification
- 5.6 Datum Point
- 5.7 Examination Coverage

UT PROCEDURE OUTLINE (cont'd.)

6.0 EQUIPMENT REQUIREMENTS

- 6.1 Examination Contractor's Equipment
- 6.2 Plant Owner's Equipment

7.0 CALIBRATION REQUIREMENTS

- 7.1 Reference Standards
- 7.2 Reference Sensitivity Level
- 7.3 Times of Calibration
- 7.4 Calibration Response

8.0 INSTRUMENT CALIBRATION VERIFICATION

- 8.1 Amplitude Linearity
- 8.2 Amplitude Control Linearity

9.0 EXAMINATION SYSTEM CALIBRATION

- 9.1 Straight Beam Calibration
- 9.2 Straight Beam Calibration Check
- 9.3 Angle Beam Calibration
- 9.4 Angle Beam Calibration Check

10.0 EXAMINATION PROCEDURES

- 10.1 Straight Beam Examination of Weld and Heat Zone
- 10.2 Straight Beam Examination of Base Material
- 10.3 Angle Beam Examinations

11.0 EVALUATION CRITERIA

- 11.1 Recording of Indications
- 11.2 Evaluation of Indications

UT PROCEDURE OUTLINE (cont'd.)

12.0 EXAMINATION RECORDS

12.1 Certification of Records

12.2 Filing of Records

13.0 EXAMINER'S CRITIQUE

13.1 Procedure Corrections and Additions

13.2 Critique Report

TABLE I

VOLUMETRIC EXAMINATION PROCEDURES

Procedure Number		
NIP-230	Rev. 1	Ultrasonic Examination Procedures for Reactor Vessel Longitudinal and Circumferential Welds
NIP-231	Rev. 1	Ultrasonic Examination Procedures for Reactor Vessel Shell Welds - Full Vee Techniques
NIP-232	Rev. 0	Ultrasonic Examination Procedures for Bottom Head to Reactor Vessel Weld, Bottom Head Meridional and Circumferential Welds and Tapered Portions of the Reactor Vessel Lower Shell Longitudinal Welds
NIP-233	Rev. 1	Ultrasonic Examination Procedures for Reactor Vessel to Flange Weld
NIP-234	Rev. 1	Ultrasonic Examination Procedures for Reactor Vessel Flange Ligament Areas
NIP-235	Rev. 1	Ultrasonic Examination Procedures for Reactor Vessel to Nozzle Welds
NIP-236	Rev. 1	Ultrasonic Examination Procedures for Reactor Vessel Inlet and Outlet Nozzle Inner Radii
NIP-238	Rev. 0	Ultrasonic Examination Procedures for Closure Head Meridional, Circumferential Dome and Flange Welds
NIP-239	Rev. 0	Ultrasonic Examination Procedures for Closure Head Nozzle Welds
NIP-241	Rev. 1	Ultrasonic Examination Procedures for Closure Head Studs and Nuts
NIP-242	Rev. 1	Ultrasonic Examination Procedures for Pressurizer Vessel Circumferential, Longitudinal and Nozzle Welds
NIP-243	Rev. 1	Ultrasonic Examination Procedures for Pressurizer Support Structure Weld
NIP-245	Rev. 0	Ultrasonic Examination Procedures for Pressurizer Vessel Nozzle Inner Radii
NIP 247	Rev. 2	Ultrasonic Examination Procedures for Steam Generator Extension Ring and Tube Sheet Welds
NIP-248	Rev. 1	Ultrasonic Examination Procedures for Steam Generator Lower (High Pressure) Head and Nozzle Welds

TABLE I

VOLUMETRIC EXAMINATION PROCEDURES (continued)

Procedure Number		
NIP-251	Rev. 0	Ultrasonic Examination Procedures for Steam Generator Nozzle Inner Radii
NIP-264	Rev. 0	Ultrasonic Examination Procedures for Steam Generator (Secondary Side) Upper Shell and Top Head Circumferential Welds, and Feedwater and Steam Outlet Nozzle Welds

TABLE 2

Other procedures used in the performance of the Louisiana Power and Light, Waterford 3 Steam Electric Station, preservice examinations are:

Visual Examination Procedures

00000-ESS-029 Rev. 0 - Visual Examination Test Procedure

00000-ESS-002 Rev. 0 - Procedure for the Operation of the Inservice Inspection Positioning Device for the Visual Examination of Reactor Pressure Vessel Interior Areas (with applicable Appendix)

Surface Examination Procedures

00000-ESS-028 Rev. 0 - Liquid Penetrant Examination Procedure

Mechanical Examination Procedure

00000-NLE-061 Rev. 3 - Procedure for the Operation of the Inservice Inspection Positioning Device for the Inside Surface Ultrasonic Examination of Reactor Pressure Vessels

EVALUATION CRITERIA

It was the intent of this program to utilize, to the maximum extent possible, the latest published evaluation criteria. A listing of the various Code examination categories and the applicable evaluation criteria follows:

Examination Category	Evaluation Criteria Used
B-A	IWB-3510, Section XI, 1974 Edition and Summer of 1974 Addenda
B-B	IWB-3511, Summer 1974 Addenda to Section XI
B-C	IWB-3511, Summer 1974 Addenda to Section XI
B-D	IWB-3512, Summer 1974 Addenda to Section XI
B-G-1	Stud: IWB-3515, Summer 1974 Addenda to Section XI Nut: NB-2585.4, Section III, 1974 Edition
B-H	NB-5330, Section III, 1974 Edition
B-I-1 & 2	IWB-3517, Summer 1974 Addenda to Section XI
C-A	IWB-3511, Summer 1974 Addenda to Section XI
C-B	IWB-3511, Summer 1974 Addenda to Section XI
C-C	NC-5352, Section III, 1974 Edition and Summer of 1974 Addenda
C-D	IWB-3515.1, Section XI, Summer 1974 Addenda to Section XI

All other categories do not apply to shop preservice examinations.

General Examination Techniques

1. Ultrasonic Examinations

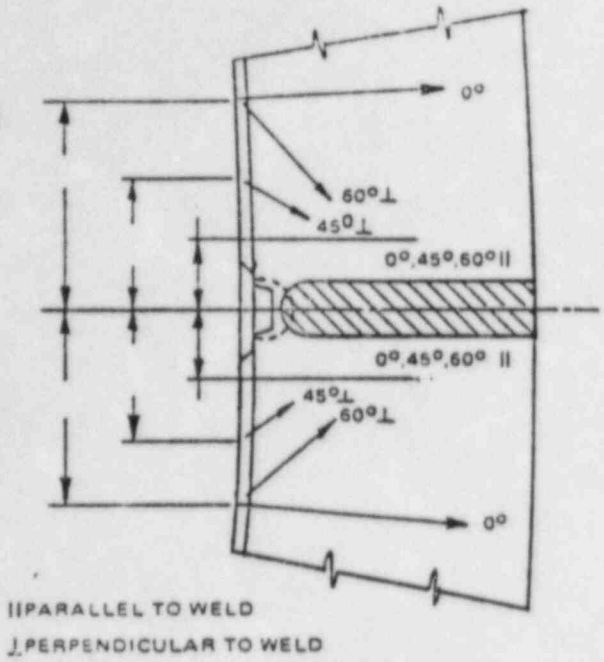
All ultrasonic examinations of basic shell welds (longitudinal, circumferential, dome and meridional), both manual and automated, were carried out with ultrasonic shear waves at angles of 45° and 60° to the surface and covered the weld and heat-affected zone and base metal for a distance of half the base metal thickness beyond the weld and heat-affected zone, with beams oriented both parallel and perpendicular to the weld. Also a straight beam examination was conducted of the weld, heat-affected zone and all base metal through which the angle beams passed. These examinations are sketched in Figure 7.

The nozzle radius sections of the reactor vessel were examined from the inner bore with 70° beams, as shown in Figure 8, and the nozzle radius sections of the steam generators were examined with a 45° beam from the outside as shown in Figure 9. The examination of pressurizer nozzle inner radii were accomplished using 60° and 70° beams as shown in Figure 10. The flange ligament areas of the reactor vessel were examined by a 0° beam from the flange surface (Figure 11), and the flange-to-shell weld was examined from the flange surface using 0°, 8°, and 19° refracted longitudinal waves (Figure 12). These sound beams were chosen so that normal beam spread would then give sufficient overlap to ensure complete coverage of the weld cross-section. The flange-to-shell weld was also examined from the ID surface of the vessel for reflectors oriented transverse to the weld using 0°, 45° and 60° beams.

The reactor vessel nozzle-to-shell welds were examined from the nozzle bore with 5° and 20° ultrasonic beams which were oriented approximately perpendicular to the weld. Examinations with 0°, 45° and 60° beams oriented in a plane parallel to the weld were performed with a special fixture mounted on the extension boom of the PaR device. The use of the special fixture for these examinations was required due to the compound curvature of these welds. The scan paths and beam directions for these examinations are shown in Figure 13.

Figure 14 depicts the examination techniques which were used to examine the closure head instrument nozzles from the ID. A remote handling tool was used to position the search units.

Prior to the start of each manual examination, the equipment was calibrated with the appropriate calibration standard. The standards for the basic shell welds were designed in accordance with the Summer of 1974 Addenda to Section XI, and the stud and nut standards were in accordance with Section III. In the absence of specific Code criteria, the remainder of the standards were designed recognizing the technical considerations evidenced by the Summer of 1974 Addenda and direct laboratory experience. Figure 15 is a photograph of typical standards. During the examination, periodic calibration checks for sweep setting and distance-amplitude correction (DAC) were done at personnel



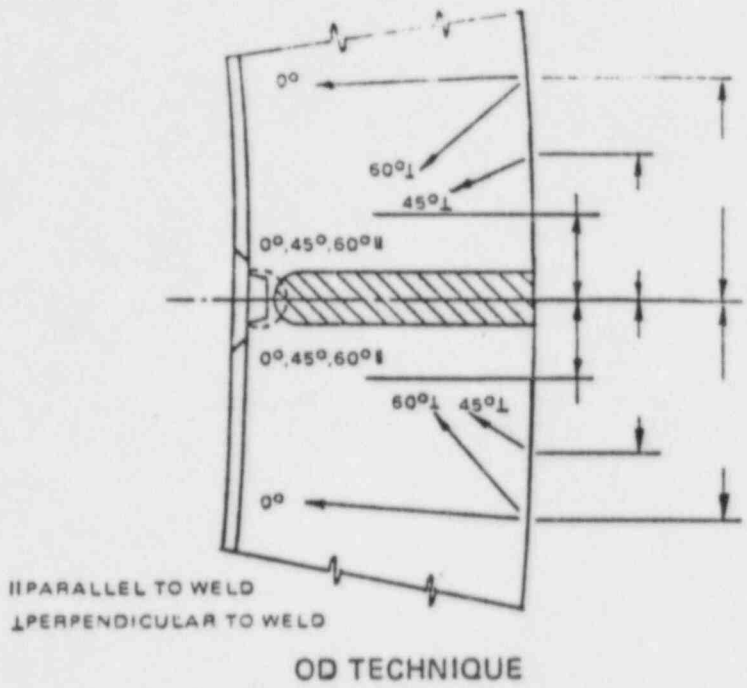


Figure 7
SHELL WELD EXAMINATION TECHNIQUES

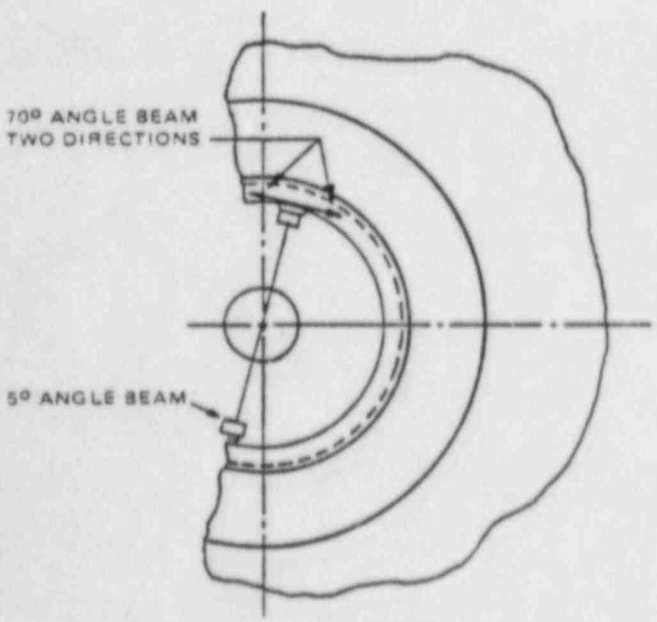


Figure 8
REACTOR VESSEL NOZZLE
RADIUS EXAMINATION TECHNIQUE

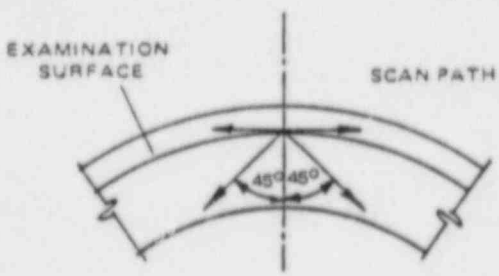


Figure 9
STEAM GENERATOR NOZZLE
RADIUS EXAMINATION TECHNIQUE

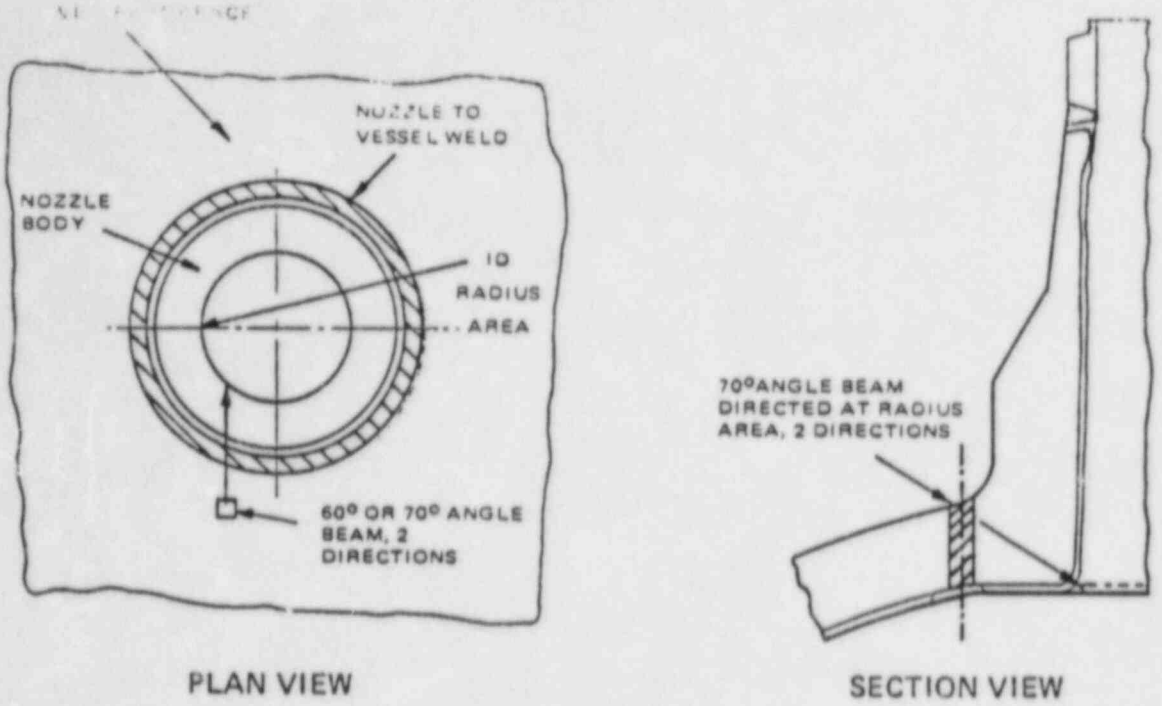


Figure 10

PRESSURIZER NOZZLE RADIUS EXAMINATION TECHNIQUE

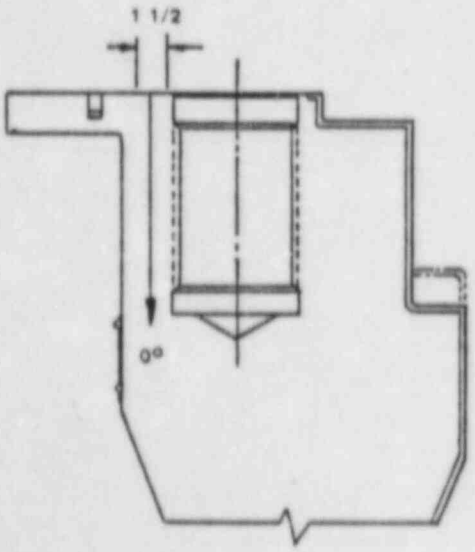


Figure 11
REACTOR VESSEL FLANGE
LIGAMENT EXAMINATION TECHNIQUE

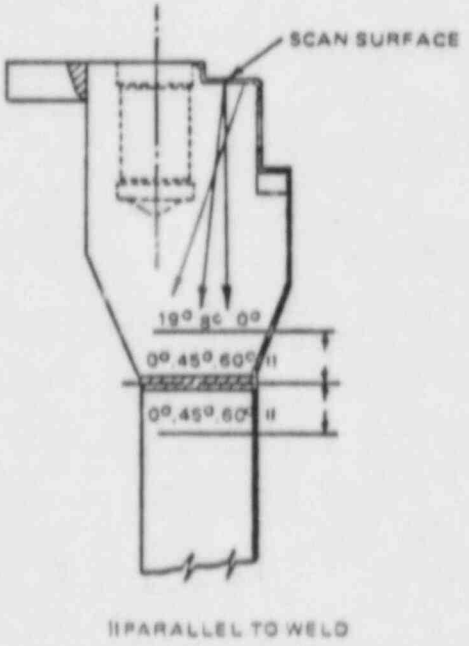


Figure 12
REACTOR VESSEL FLANGE
WELD EXAMINATION TECHNIQUE

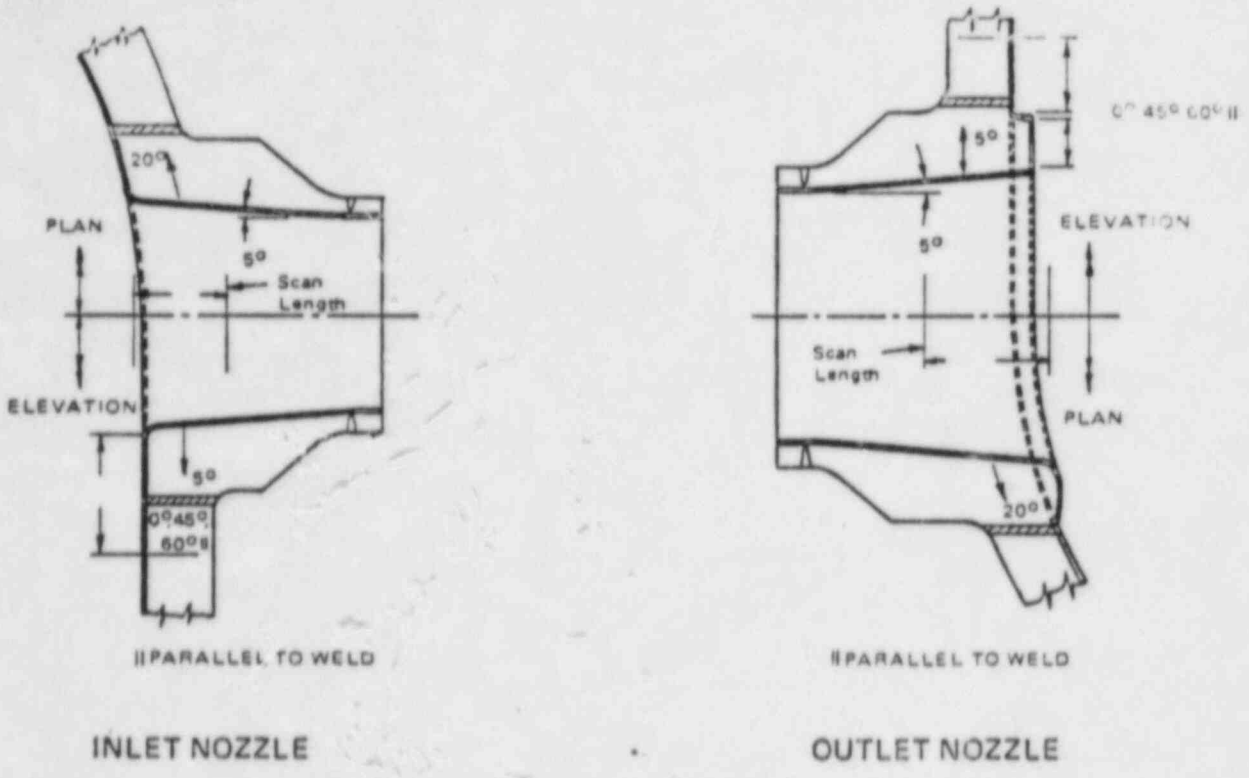


Figure 13
REACTOR VESSEL NOZZLE EXAMINATION TECHNIQUE

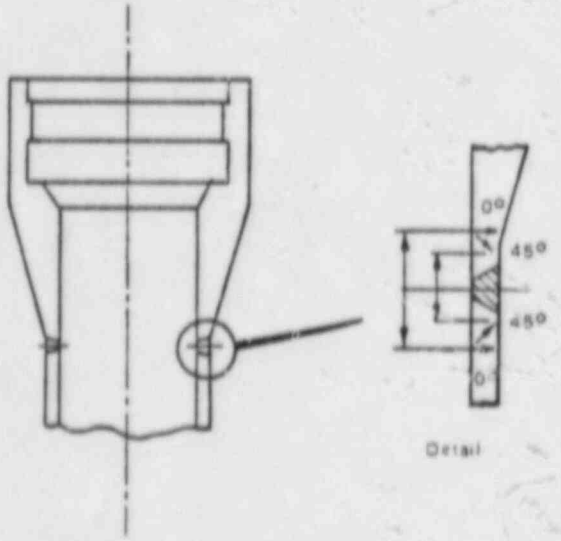


Figure 14
CLOSURE HEAD INSTRUMENT NOZZLE EXAMINATION TECHNIQUE

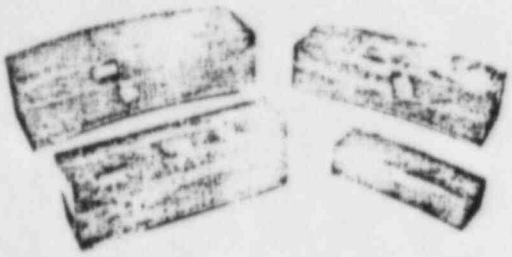


Figure 15
Typical Calibration Standards

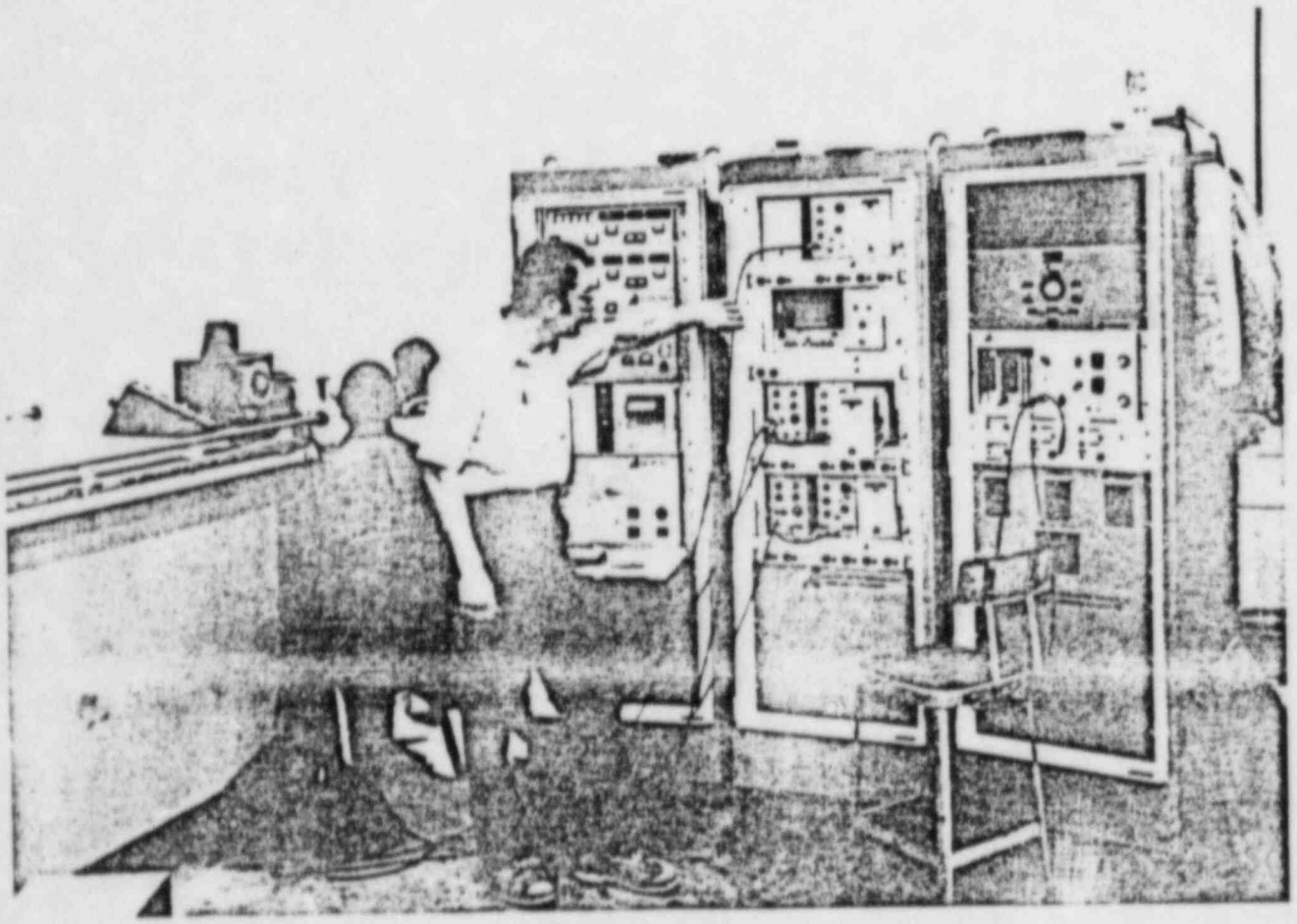


Figure 16
Precalibration of Reactor Vessel Examination Equipment

changes, equipment changes, or at intervals of no more than four hours. In addition, at the beginning of each day of examinations, instrument linearity was verified as required by Section XI.

The instrument setting and DAC curve resulting from the calibration were defined as the reference sensitivity. For both the manual and mechanical examinations all scanning was carried out with a gain setting of twice the reference gain, and any indications were evaluated with the instrument re-adjusted to the reference sensitivity.

Special procedures were required for the calibration of the instrument used for the remote mechanical examinations. Prior to the start of testing, pre-calibrations were performed in a laboratory setting using the actual calibration standards, search units and scan fixtures in their examination configurations (Figure 16). These pre-calibrations established approximate settings for the various controls involved in the final calibration of the Nuclear Reflectoscope.

During the course of the examinations, the calibration standards were retained in an immersion tank convenient to the test area. At the beginning and the end of each shift and at any other time that an examination requiring a different calibration standard was begun, the search unit fixture was removed from the inspection device and the entire examination system was calibrated using the calibration standards in the immersion tank for the new set of examinations.

Section XI requires the calibration to be checked at intervals no greater than four (4) hours. These periodic checks were carried out by means of the Transponding Ultrasonic Calibration (TUC). This device simulated the response from the calibration standards and was programmed during each calibration to give the responses to the Nuclear Reflectoscope which were identical to those of the search unit - block combination. In this manner, the proper operation of the examination system could be checked easily and frequently.

2. Surface Examinations

The surface examinations were performed with "Spotcheck" Brand materials using standard solvent removable liquid penetrant techniques.

3. Visual Examinations

The visual examinations of the reactor vessel closure head, the steam generators and the pressurizer were performed by direct means, with use, where necessary, of auxiliary lighting. The clad patches, snubber lugs, and core stop lugs of the reactor vessel were examined with a remote television camera mounted on the lower boom of the PaR device. The mounting bracket for the camera, in conjunction with the pivoting capability of the lower boom, enabled the examiner to manipulate the camera to examine all sides of the lugs as necessary. All remote visual examinations were recorded on videotape with audio commentary by the qualified Level II examiner.

In the following sections are details of the examinations for each area and a listing of the reportable indications. Further details of the evaluations performed on indications found by the automated ultrasonic equipment are given in the Introduction to Volume 4 of the Preservice Examination Program and Report.

Examination Details and Results

Descriptions of the examinations performed and results are given below. Further details of the examination techniques can be found in procedures contained in Volume 2 of the Preservice Examination Program and Report. More details on certain of the automated ultrasonic examinations are given in the Introduction to Volume 4 of the Preservice Examination Program and Report.

1. Reactor Pressure Vessel

a. Flange-to-Vessel Weld

This weld was examined with ultrasonic beams directed both parallel and perpendicular to the weld. The parallel examination was performed from the vessel shell surface using the ID inspection device. The perpendicular examination was performed using a track mounted on the flange surface. During both of these examinations, no reportable indications were seen.

b. Flange Ligament Areas

The examinations of these areas were carried out using automated equipment mounted on the vessel flange. No reportable indications were seen.

c. Longitudinal and Circumferential Shell Welds

With exceptions noted below, all shell seam welds were examined from the ID surface, using the ID positioning device described earlier.

The search unit fixture used for the bulk of the shell examinations is shown in Figure 17. Five transducers, two for 60°, two for 45°, and one for 0° are mounted on a frame which is mounted through a spring-loading to the inspection boom. Wheeled casters on the frame produce a constant water path of about 3-1/2". The fixture, being mounted on the rotator, can be used in both a horizontal and vertical configuration, and provision is made for changing the mounting angles of the angle beam transducers to give the correct examination angles for both orientations. This fixture is shown in use in Figure 18.

There are certain areas inside the vessel where the movement of the search unit fixture over the entire examination area is prevented. These areas are those where the outlet nozzle extensions interfere with the scans of the upper shell long seams and where the snubber lugs and core stop lugs interfere with the examinations of the lower shell-to-bottom head weld. To obtain the maximum possible coverage in these areas, scans were made with a smaller search unit fixture which contained a 0° transducer and one each for 45° and 60°. Being smaller, this fixture could be run close to the obstruction to give as complete an examination as possible; the movement of the fixture was monitored and controlled visually via the remote television system.

The tapered portion at the bottom of the lower shell was examined manually from both the OD surface, and remotely from the ID surfaces.

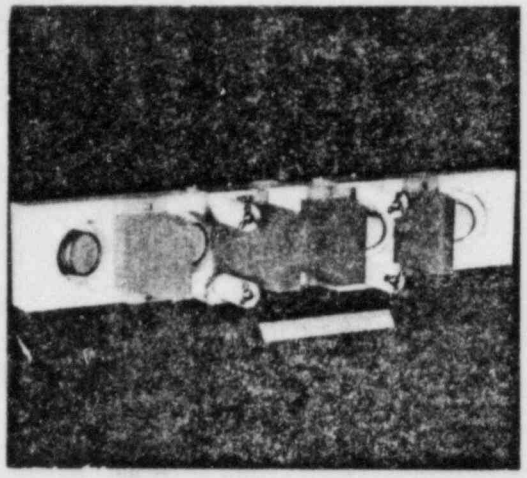


Figure 17 - Search Unit Fixture for ID Examination of Reactor Vessel Shell Welds

Figure 18 - ID Examination Fixture in Use

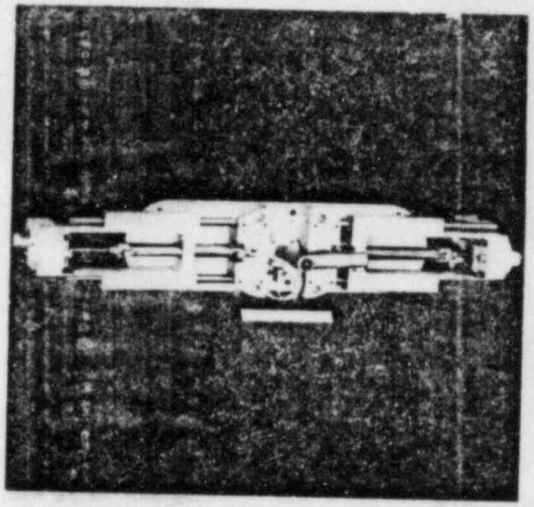


Figure 19 - Search Unit Fixture for Examination of Reactor Vessel Nozzle Welds from Nozzle Bore

The ID examination was performed using the remotely controlled equipment and techniques previously described; the presence of the snubber lugs in this area resulted in small pieces of the lower shell to bottom head circumferential weld not being examined.

The OD examinations were conducted manually. The straight beam examinations of these welds from the OD were conducted using a 14° refracted longitudinal beam to match the taper and allow presentation of a back reflection on the screen of the ultrasonic instrument. It should be noted that the complete OD examination and nearly complete ID examination of this girth weld gives considerable flexibility in the planning of the examination of this weld during subsequent inservice inspections.

A number of indications were seen in the shell welds, all but one being laminations in the base metal seen with the 0° beam; all were within Code acceptance limits. The table below lists all reportable indications in the reactor vessel, along with their physical dimensions, location, and amplitude of response; the area for each was obtained by approximating the indication as an ellipse whose axes were the measured length and width of the indication.

LOCATION OF MAXIMUM RESPONSE

Laminar Indications

Weld	Inches from Flange	Angle	Approximate Area (in^2)	Amplitude (%FSH)
Upper Shell 90° long seam	95.8"	214.82°	0.018	50
Middle Shell 210° long seam	209.9"	215.02°	0.108	50
Middle Shell 330° long seam	214.7"	339.24°	0.081	50
Middle Shell-Lower Shell Girth Seam	280.13"	113.85°	0.094	55
	285.35"	78.47°	0.001 or less	40
	286.09"	91.26°	0.214	60
	311.72"	83.54°	0.303	70

There was also a non-planar elliptical subsurface indication which was characterized as follows:

Lower Shell 90° long seam	324.6"	100.87°	0.023 in^2 laminar; a/l=25% a/t=0.6%	125% DAC

d. Nozzle Welds

The nozzle-to-vessel welds were examined from both the nozzle bores with beams transmitted perpendicular to the weld and from the ID of the shell with beams approximately parallel to the weld. No reportable indications were seen.

The search unit fixture used for the nozzle bore examinations is shown in Figure 19. The beam angles used were 5° and 20°; the latter angle is used to ensure coverage in areas which might be hidden from the 5° beam because of the contour. The search unit are mounted on arms which are extended by pneumatic cylinders to put casters on the search units into contact with the nozzle bore and to obtain the proper water path. In operation, the device is inserted into the nozzle with the search units retracted and rotated while the reflection of the beam of the 5° search unit from the nozzle bore is observed. Equal timing of the echo at all points of the rotation indicated exact centering of the device in the nozzle.

The examinations with beams parallel to the weld were carried out using a fixture mounted on the end of the PaR positioning device inspection boom (See Figure 5). Using the centerlines determined for the bore exams, this device rotated the search unit fixture on the vessel wall about the nozzle centerlines. A pneumatic cylinder and a gimbal arrangement were used to keep the fixture properly on the wall while moving around the compound curvature of the vessel wall. Because of the compound curvature, it was not possible to keep the beams exactly parallel to the weld at all points around the nozzle; departures of up to 30° from exactly parallel resulted.

e. Nozzle Inner Radii

The inner radius sections of all nozzles were examined from the nozzle bores, using the same pneumatic fixture as was used for the weld exams with a different search unit fixture. The search unit used gave an angle of 70° in both directions. No reportable indications were seen.

f. Bottom Head Welds

The welds on the bottom head, the dome weld, the meridional welds, and the lower shell-to-bottom head weld were examined manually from the OD surface (as well as the lower portions of the lower shell longitudinal welds, as mentioned earlier). The entire lower shell longitudinal welds and the lower shell-to-bottom head weld were also examined from the ID using the positioning device, but, because of the stop and snubber lugs, these examinations were limited. The OD exams, however, were in no way obstructed. No reportable indications were seen.

g. Closure Studs, Nuts, and Washers

All closure studs and nuts were examined with 0° beams from both ends of each stud and the flat surface of each nut. No reportable indications were seen. The washers were examined visually, with no reportable indications seen.

h. Vessel Cladding

The appropriate areas of the vessel cladding were examined visually using a TV camera mounted on the PaR positioning device. These examinations were recorded on videotape. No reportable indications were seen.

i. Snubber Lugs and Core Stop Lugs

The welds and surface areas of these components were examined visually using a TV camera mounted on the PaR positioning device; the mounting bracket was adjustable to provide for observing all sides. The examinations carried out were recorded on videotape. The TV examinations showed minor surface markings and discolorations. (The TV presentation was in black-and-white.) These areas were examined directly when the vessel had been drained and removed from the hydro pit, and the markings proved to be films of machine oil and dye. Thus, there were no adverse indications seen on these parts.

2. Reactor Pressure Vessel Closure Head

All closure head welds, the dome weld, the meridional welds, and the flange weld, were examined manually using 0°, 45°, and 60° beams from both the OD and ID surfaces. The instrument nozzles were examined from the ID by means of manually controlled remote fixturing and manual ultrasonics, using 0° and 45° beams both parallel and perpendicular to the weld. Surface examinations (liquid penetrant) and visual examinations were performed on six clad patches located at various points on the ID of the head. No reportable indications were seen.

3. Steam Generators

Manual ultrasonic examinations were performed on all primary side welds of the two steam generators, with the exception of the stay cylinder welds, which will be examined by the field baseline examination contractor using mechanized equipment. Those girth and nozzle welds of the secondary sides whose examinations are required by the Code were also examined, as were the support skirt weld and the inner radii of the primary nozzles. No reportable indications which were not geometric in nature were found.

Geometric indications were seen in both generators. The angle beam examinations of the hemispherical head-to-extension ring welds and of the extension ring-to-tube sheet welds (primary side) produced small echoes from the inside corner of the primary head. The angle beam examinations of the nozzle-to-shell welds and of the support skirt welds also produces geometric echoes. Most of these geometric indications were small, often less than the reporting level of 50 percent DAC, and there was no question of their geometric nature.

Visual examinations were performed on clad patches on each side of the primary heads and on the secondary manway areas. Minor but acceptable indications were seen. Surface examinations were performed using liquid penetrant techniques on the attachment welds of the snubber lugs and key lugs on the secondary sides of both generators. The #1 generator was acceptable. Rejectable porosity and gouges were observed on the #2 generator. Grinding and minor weld repair was performed on these areas under the supervision of the fabrication shop's Quality Assurance personnel, and the result was that these four lugs satisfactorily passed the penetrant examination.

4. Pressurizer

Ultrasonic examinations were performed on the shell, nozzle and support welds and the nozzle radii. One reportable indication was seen with the 0° beam during the examination of the attachment weld for the safety nozzle at 225°. It was located 2" along the weld from the datum point and 7-3/4" from the weld centerline. It was a spot indication no larger than the transducer and well within Code acceptance limits. No other reportable indications were noted. A clad patch on the inside of the top head was examined visually, and no reportable indications were noted.

INTRODUCTION

The following table summarizes the results of all examinations performed. It is presented with a separate section for each component examined, and within each section, the individual examination areas are listed by number. The drawing and table which accompanies each section gives the examination area corresponding to each number.

In the column headed "Examination Method", all UT examinations are manual and visual unless stated otherwise.

The column headed "Examination Data Sheet Number" is used for the ultrasonic examinations. In it is listed the number(s) of the calibration sheet(s) used for the examination of each weld with each required angle. For the mechanical examinations, the search units are on one fixture and all angle beam examinations are performed together. The calibrations are also carried out at the same time, and the calibration sheets for each angle comprise the separate pages of one calibration sheet with its own calibration sheet number. For all the UT examinations, more than one calibration sheet number is sometimes shown for one examination with one angle. These cases arose when one examination on one weld was performed by more than one crew and/or on more than one day. No data sheet number is assigned to the data sheets from the visual and surface examinations.

In the summary tables, the various columns under the general heading "Examination Results" have the following meanings:

No Indications - Self-explanatory for the visual and surface examinations. In the case of the ultrasonic examinations, this column indicates no indications exceeding the reporting level of 50% DAC were seen.

Significant Indications-Geometrical - For the ultrasonic examinations, this column is used to indicate a situation in which a reflection from a contour within the component produced a reflection which exceeded 50% DAC.

Significant Indications-Other - This column denotes true ultrasonic indications, those which exceeded 50% DAC and were not due to geometry. For visual and surface indications, a mark in this column indicates that there were minor indications noted. All areas requiring visual and/or surface examinations were acceptable

Remarks - This column is used as needed.

REACTOR VESSEL EXAMINATION AREAS

Area Number	Area Description
01-001	Bottom Head Dome Weld
01-002 ↓ 01-007	Bottom Head Peel Segment Welds
01-008	Bottom Head-Lower Shell Circumferential Welds
01-009 ↓ 01-011	Lower Shell Longitudinal Welds
01-012	Lower Shell-Middle Shell Circumferential Weld
01-013 ↓ 01-015	Middle Shell Longitudinal Welds
01-016	Middle Shell-Upper Shell Circumferential Weld
01-017 ↓ 01-019	Upper Shell Longitudinal Welds
01-020	Flange-Shell Weld
01-021 ↓ 01-026	Nozzle-Shell Welds
01-027 ↓ 01-032	Nozzle Inner Radius Areas
01-033 ↓ 01-038	Vessel Cladding

REACTOR VESSEL EXAMINATION AREAS

Area Number	Area Description
01-039 ↓ 01-044	Snubber Lugs
01-045 ↓ 01-053	Core Stop Lugs
01-L-1 ↓ 01-L-54	Flange Ligament Areas
01-S-1 ↓ 01-S-54	Closure Studs
01-N-1 ↓ 01-N-54	Closure Nuts

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
ZONE 1 REACTOR PRESSURE VESSEL						
01-001	Vol. -UT	232-2	0°			
		232-4	45°			
		232-5	60°			
01-002		232-2	0°			
		232-4	45°			
		232-5	60°			
01-003		232-2	0°			
		232-4	45°			
		232-5	60°			
01-004		232-2	0°			
		232-4	45°			
		232-5	60°			
01-005		232-2	0°			
		232-4	45°			
		232-5	60°			
01-006		232-2	0°			
		232-4	45°			

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
	Vol. -UT	232-5	60°			
01-007		232-2	0°			
		232-4	45°			
		232-5	60°			
01-008		232-9	0°			
		232-1	14°			
		232-4	45°			
		232-5	60°			
	Mech. UT	230-14,15	0°,45°, 60°			
01-009	Vol. -UT	232-3,6	0°			
		232-1	14°			
		232-7	45°			
		232-8	60°			
	Mech. UT	230-12,16	60°		0°, 45°	4 small laminations 1 small subsurface elliptical indication.
		231-1	45°,60° full V			
01-010	Vol. -UT	232-3, 6	0°			

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
	Vol. -UT	232-1	14^{o}			
		232-7	45^{o}			
		232-8	60^{o}			
	Mech. UT	230-9,16	0^{o}, 45^{o}, 60^{o}			
01-011	Vol. -UT	232-3,6	0^{o}			
		232-1	14^{o}			
		232-7	45^{o}			
		232-8	60^{o}			
	Mech. UT	230-10, 16	0^{o}, 45^{o}, 60^{o}			
01-012		230-1, 11, 12	0^{o}, 45^{o}, 60^{o}			
		231-1	45^{o},60^{o}full-V			
01-013		230-5	0^{o}, 45^{o}, 60^{o}			
		231-1	45^{o},60^{o}full-V			
01-014		230-7	45^{o}, 60^{o}		0^{o}	Small lamination
01-015		230-8	45^{o}, 60^{o}		0^{o}	Small lamination
01-016		230-6	0^{o},45^{o},60^{o}			
01-017		230-2,14	0^{o},45^{o},60^{o}			
01-018		230-1,14	45^{o},60^{o}		0^{o}	Small Lamination

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
01-019	Mech. UT	230-3,14	0^{o},45^{o},60^{o}			
01-020		230-4	0^{o},45^{o},60^{o} parallel			
		233-1	0^{o}, 8^{o},19^{o} normal			
01-021		230-13	0^{o}, 45^{o},60^{o} parallel			
		235-1	5^{o} normal			
01-022		230-13	0^{o},45^{o},60^{o} parallel			
		235-1	5^{o},20^{o}normal			
01-023		230-13	0^{o},45^{o},60^{o} parallel			
		235-1	5^{o},20^{o}normal			
01-024		230-13	0^{o},45^{o},60^{o} parallel			
		235-1	5^{o} normal			
01-025		230-13	0^{o},45^{o},60^{o} parallel			
		235-1	5^{o},20^{o}normal			
01-026		230-13	0^{o},45^{o},60^{o} parallel			

NON-DESTRUCTIVE EXAMINATION SUMMARY

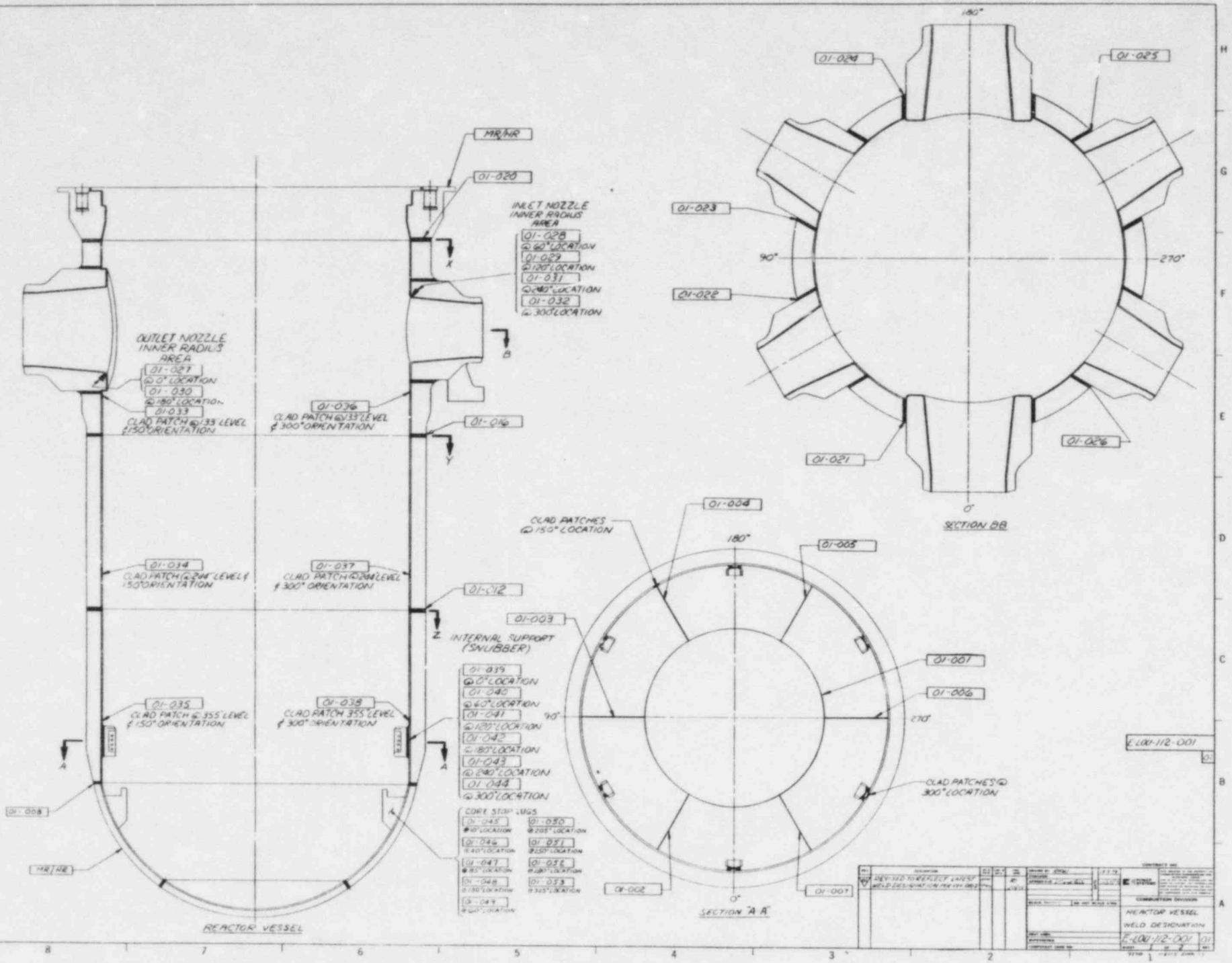
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
01-026	Mech. UT	235-1	5^{o}, 20^{o} normal			
01-027		236-1	70^{o}			
01-028						
01-029						
01-030						
01-031						
01-032						
01-033	Remote Vis	N/A	X			
01-034		N/A	X			
01-035		N/A	X			
01-036		N/A	X			
01-037		N/A	X			
01-038		N/A	X			
01-039		N/A			X	Temporary Oil
01-040		N/A			X	and dye
01-041		N/A			X	
01-042		N/A			X	

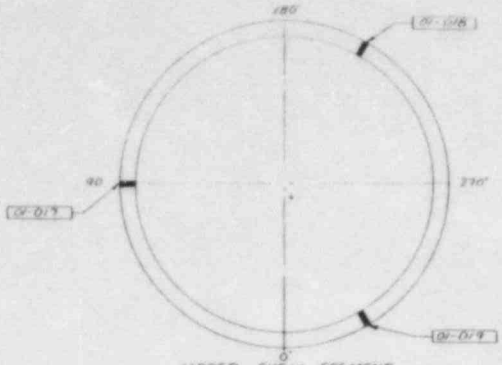
NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
01-043	Remote Vis	N/A			X	
01-044	↓	N/A			X	
01-045		N/A	X			
01-046		N/A	X			
01-047		N/A	X			
01-048		N/A	X			
01-049		N/A	X			
01-050		N/A	X			
01-051		N/A	X			
01-052		N/A	X			
01-053	↓	N/A	X			
01-L-01	Mech. UT	234-1	0°			
↓	↓	↓	↓			
01-L-54						
01-S-01	Vol. -UT	241-2				
↓	↓	↓				
01-S-54						
01-N-01		241-1				
↓		↓				
01-N-54	↓	↓	↓			

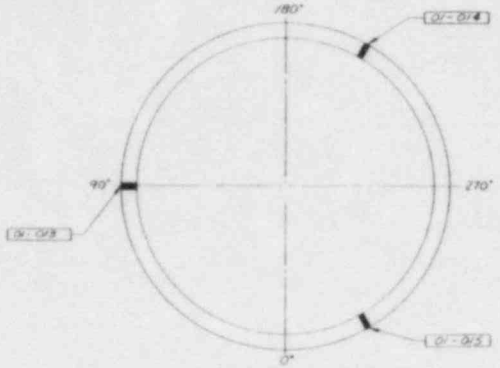
NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
01-W-01 ↓ 01-W-54	Vis. ↓	N/A ↓	X ↓			

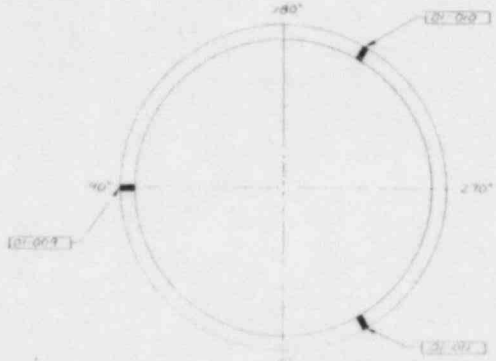

MR/HR
01-020
INLET NOZZLE INNER RADIUS AREA
01-028 @ 60° LOCATION
01-029 @ 120° LOCATION
01-031 @ 240° LOCATION
01-032 @ 300° LOCATION
OUTLET NOZZLE INNER RADIUS AREA
01-027 @ 0° LOCATION
01-030 @ 180° LOCATION
01-033 CLAD PATCH @ 33' LEVEL @ 150° ORIENTATION
01-036 CLAD PATCH @ 33' LEVEL @ 300° ORIENTATION
01-016
01-034 CLAD PATCH @ 284' LEVEL @ 150° ORIENTATION
01-037 CLAD PATCH @ 284' LEVEL @ 300° ORIENTATION
01-012
INTERNAL SUPPORT (SNUBBER)
01-039 @ 0° LOCATION
01-040 @ 60° LOCATION
01-041 @ 120° LOCATION
01-042 @ 180° LOCATION
01-043 @ 240° LOCATION
01-044 @ 300° LOCATION
01-035 CLAD PATCH @ 355' LEVEL @ 150° ORIENTATION
01-038 CLAD PATCH 355' LEVEL @ 300° ORIENTATION
01-008
HR/HR
CORE STOP LUGS
01-045 @ 10° LOCATION
01-046 @ 40° LOCATION
01-047 @ 85° LOCATION
01-048 @ 130° LOCATION
01-049 @ 175° LOCATION
01-050 @ 205° LOCATION
01-051 @ 250° LOCATION
01-052 @ 295° LOCATION
01-053 @ 325° LOCATION
REACTOR VESSEL
180°
01-024
01-025
01-023
90°
270°
01-022
01-026
01-021
0°
SECTION BB
CLAD PATCHES @ 150° LOCATION
01-004
180°
01-005
01-003
01-007
01-006
90°
270°
CLAD PATCHES @ 300° LOCATION
01-002
01-007
0°
SECTION "A A"
E-001-112-001
REVISED TO REFLECT LATEST WELD DESIGNATION PER CPC ONLY
REACTOR VESSEL
WELD DESIGNATION
E-001-112-001
01



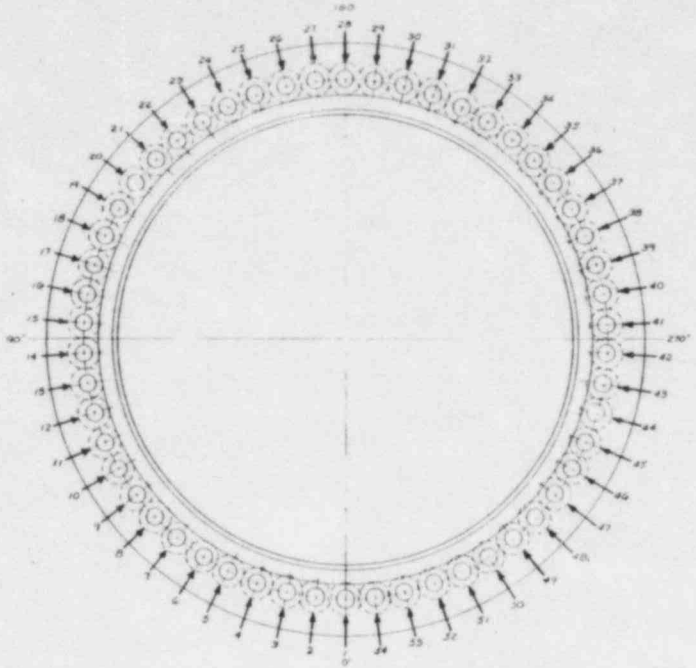
UPPER SHELL SEGMENT
SECTION "X-X"
SCALE: NONE



MIDDLE SHELL SEGMENT
SECTION "Y-Y"
SCALE: NONE



LOWER SHELL SEGMENT
SECTION "Z-Z"
SCALE: NONE



REACTOR VESSEL FLANGE
PLAN VIEW

LIGAMENT DESIGNATIONS

1	0F-L-1	28	0F-L-28
2	0F-L-2	29	0F-L-29
3	0F-L-3	30	0F-L-30
4	0F-L-4	31	0F-L-31
5	0F-L-5	32	0F-L-32
6	0F-L-6	33	0F-L-33
7	0F-L-7	34	0F-L-34
8	0F-L-8	35	0F-L-35
9	0F-L-9	36	0F-L-36
10	0F-L-10	37	0F-L-37
11	0F-L-11	38	0F-L-38
12	0F-L-12	39	0F-L-39
13	0F-L-13	40	0F-L-40
14	0F-L-14	41	0F-L-41
15	0F-L-15	42	0F-L-42
16	0F-L-16	43	0F-L-43
17	0F-L-17	44	0F-L-44
18	0F-L-18	45	0F-L-45
19	0F-L-19	46	0F-L-46
20	0F-L-20	47	0F-L-47
21	0F-L-21	48	0F-L-48
22	0F-L-22	49	0F-L-49
23	0F-L-23	50	0F-L-50
24	0F-L-24	51	0F-L-51
25	0F-L-25	52	0F-L-52
26	0F-L-26	53	0F-L-53
27	0F-L-27	54	0F-L-54

E-LOU-112-001

			GE	A
			REACTOR VESSEL WELD DESIGNATIONS	
			E-LOU-112-001	

8 7 6 5 4 3 2 1

REACTOR VESSEL CLOSURE HEAD EXAMINATION AREAS

Area Number	Area Description
02-001	Flange-Torus Weld
02-002 ↓ 02-005	Peel Segment Welds-from OD ↓
02-006 ↓ 02-009	Peel Segment Welds-from ID ↓
02-010	Dome-Torus Weld
02-011 ↓ 02-016	Clad Patches ↓
02-T-92 ↓ 02-T-101	Instrument Nozzle Welds ↓

NON-DESTRUCTIVE EXAMINATION SUMMARY

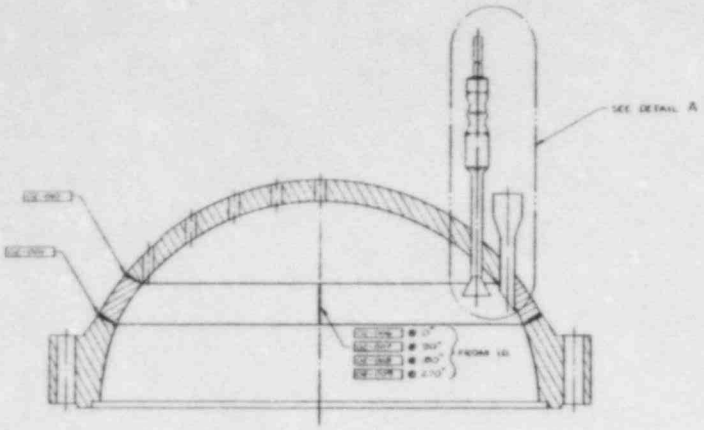
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
ZONE 2 REACTOR VESSEL CLOSURE HEAD						
02-001	Vol. -UT	238-1, 4, 5	0°			
		238-2, 6	45°			
		238-3, 7	60°			
02-002		238-5	0°			
		238-6	45°			
		238-7	60°			
02-003		238-5	0°			
		238-6	45°			
		238-7	60°			
02-004		238-4	0°			
		238-6	45°			
		238-7	60°			
02-005		238-4	0°			
		238-6	45°			
		238-7	60°			

NON-DESTRUCTIVE EXAMINATION SUMMARY

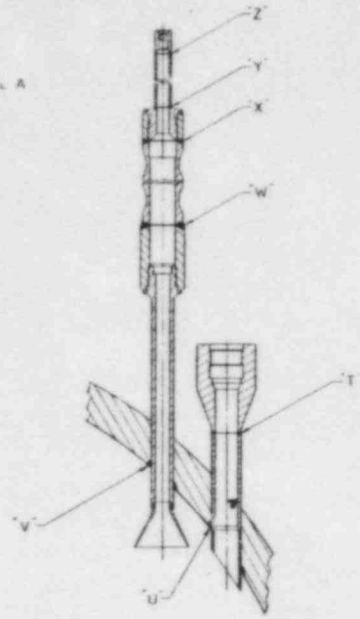
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
02-006	Vol. -UT	238-1	0°			
		238-2	45°			
		238-3	60°			
02-007		238-1	0°			
		238-2	45°			
		238-3	60°			
02-008		238-1	0°			
		238-2	45°			
		238-3	60°			
02-009		238-1	0°			
		238-2	45°			
		238-3	60°			
02-010		238-1,4,5	0°			
		238-2,6	45°			
		238-3,7	60°			
02-011	Vis.	N/A			X	
	Surf.-PT	N/A	X			Minor gouges, grind marks and scratches.

NON-DESTRUCTIVE EXAMINATION SUMMARY

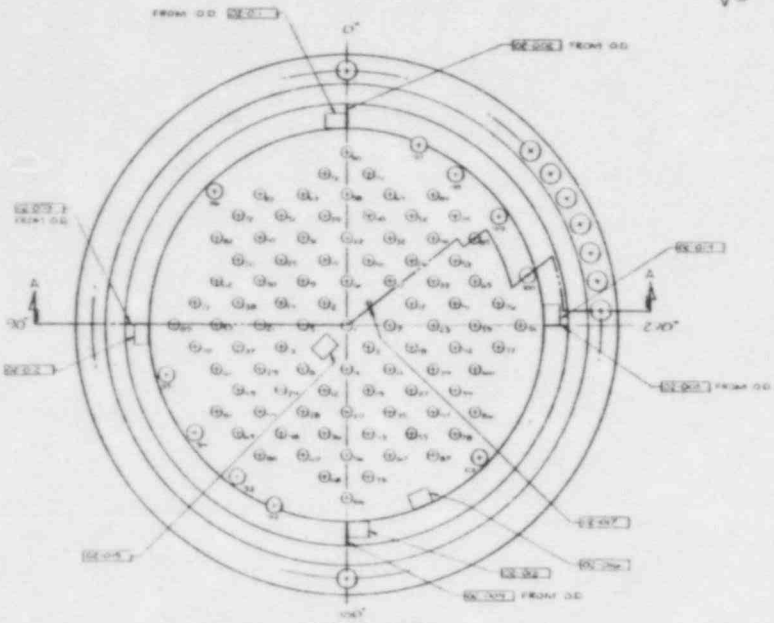
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
02-012	Vis.	N/A			X	
	Surf.-PT	N/A	X			
02-013	Vis.	N/A			X	
	Surf.-PT	N/A	X			
02-014	Vis.	N/A			X	
	Surf.-PT	N/A	X			
02-015	Vis.	N/A			X	
	Surf.-PT	N/A	X			
02-016	Vis.	N/A			X	
	Surf.-PT	N/A	X			
02-T-92	Vol. -UT	239-1	0^{o}			
↓	↓	239-2	45^{o} axial			
02-T-101		239-3	45^{o} circ.			



SECTION A-A
SCALE 3/4" = 1'-0"



DETAIL A
SCALE 1½" = 1'-0"



CLOSURE HEAD
SCALE 3/4" = 1'-0"

INSTRUMENT WELD DESIGNATIONS

T		U	
DETAIL		DETAIL	

GEOM WELD DESIGNATIONS

W		X		Y		Z	
DETAIL		DETAIL		DETAIL		DETAIL	

V		V		V	
DETAIL		DETAIL		DETAIL	

E-LOU-112-002

CONTRACT NO.

WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR POWER SYSTEMS

SIZE Z CLOSURE HEAD
WELD DESIGNATIONS

E-LOU-112-002 Y1

8 7 6 5 4 3 2 1

H G F E D C B A

STEAM GENERATOR #1 EXAMINATION AREAS

Area Number	Area Description
03-001	Support Skirt Weld
03-002	Stay Cylinder Base-Hemisphere Weld
03-003 ↓ 03-007	Peel Segment Welds
03-008	Hemisphere-Extension Ring Weld
03-009	Extension Ring-Tube Sheet Weld
03-010 ↓ 03-012	Nozzle-Hemisphere Welds
03-013 ↓ 03-016	Extension Ring Longitudinal Welds
03-017 ↓ 03-018	Clad Patches
03-019 ↓ 03-021	Nozzle Inner Radius Areas
03-024	Extension Ring-to-Tube Sheet Weld
03-025	Extension Ring-to-Lower Shell Weld
03-026	Intermediate Shell-to-Cone Weld
03-027	Cone-to-Upper Shell Weld
03-028	Upper Shell-to-Top Head Weld
03-029	Top Head Dome-to-Torus Weld
03-030	Steam Nozzle-to-Top Head Weld

STEAM GENERATOR #1 EXAMINATION AREAS

Area Number	Area Description
03-031	Feedwater Nozzle-to-Shell Weld
03-057	Manway
03-058	
03-059	Support Lugs
03-060	
03-061	
03-062	

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
ZONE 3 STEAM GENERATOR # 1						
03-001	Vol.-UT	248-9	0°			
		248-10	45°			
		248-11	60°			
03-002		248-1	0°			
		248-3	45°			
		248-2	60°			
03-003		248-4	0°			
		248-3	45°			
		248-2	60°			
03-004		248-5	0°			
		248-3	45°			
		248-2	60°			
03-005		248-5	0°			
		248-3	45°			
		248-2	60°			

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
03-006	Vol. -UT	248-5	0°			
		248-3	45°			
		248-2	60°			
03-007		248-4	0°			
		248-3	45°			
		248-2	60°			
03-008		247-1,2,3	0°			
		247-4,5,6,9	45°			
		247-7,8	60°			
03-009		247-1,2,3	0°			
		247-4,5,6,9		45°		
		247-7,8		60°		
03-010		248-8	0°			
		248-7		45°		
		248-6		60°		
03-011		248-8	0°			
		248-7		45°		

NON-DESTRUCTIVE EXAMINATION SUMMARY

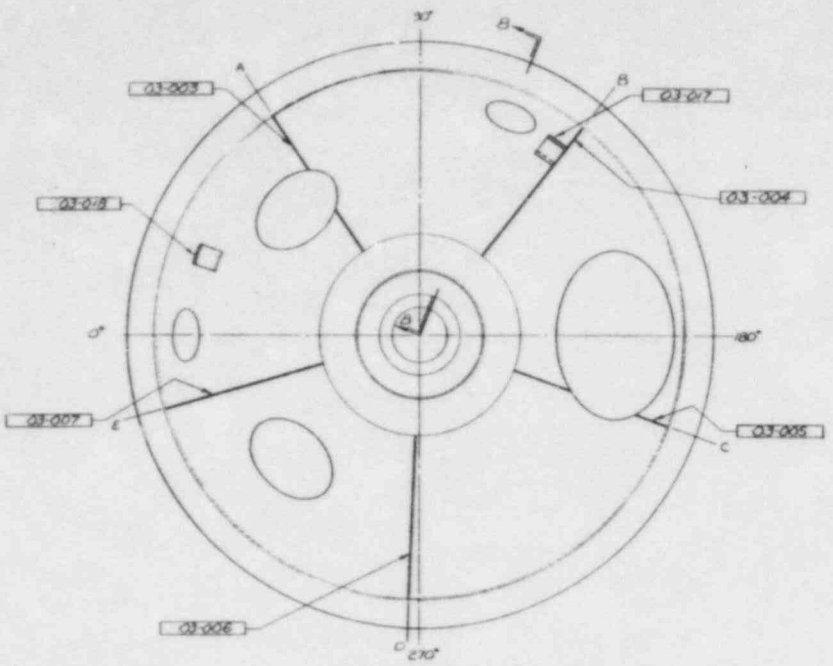
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
03-011	Vol. -UT	248-6		60°		
03-012		248-8	0°			
		248-7		45°		
		248-6		60°		
03-013		247-1	0°			
		247-4	45°			
		247-8	60°			
03-014		247-3	0°			
		247-4	45°			
		247-7	60°			
03-015		248-3	0°			
		248-5	45°			
		248-7	60°			
03-016		248-2	0°			
		248-9	45°			
		248-7	60°			
03-017	Vis.	N/A	X			
03-018		N/A			X	Minor grind marks and scratches

NON-DESTRUCTIVE EXAMINATION SUMMARY

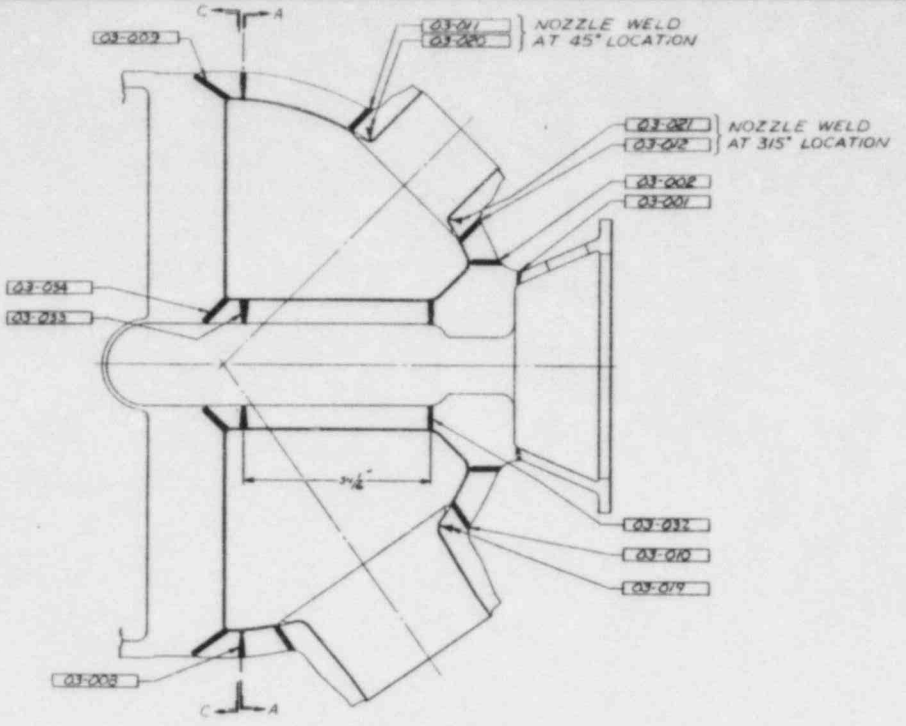
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
03-019	Vol. -UT	251-1	45°			
03-020		↓	↓			
03-021						
03-024		264-13,15,16	0°			
		264-12	45°			
		264-9	60°			
03-025		264-13,15,16	0°			
		264-12	45°			
		264-9	60°			
03-026		264-2,14,17	0°			
		264-10,19	45°			
		264-4,5,18	60°			
03-027		264-2,14,17	0°			
		264-10,19	45°			
		264-4,5,18	60°			
03-028		264-3,6	0°			
		264-11	45°			
	↓	264-7,9	60°			

NON-DESTRUCTIVE EXAMINATION SUMMARY

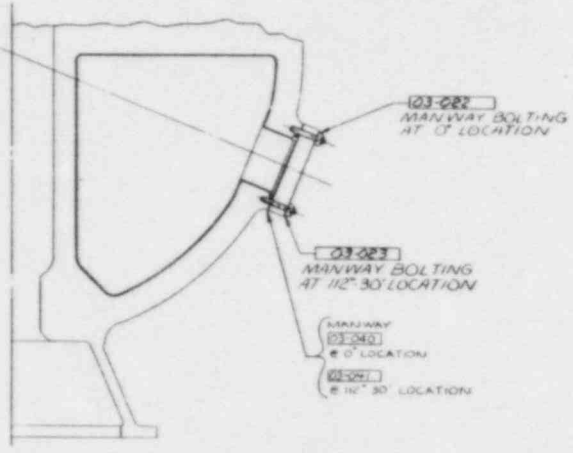
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
03-029	Vol. -UT	264-6	0°			
		264-8,10	45°			
		264-7	60°			
03-030		264-6	0°			
		264-8	45°			
		264-7	60°			
03-031		264-2	0°			
		264-10	45°			
		264-5	60°			
03-057	Vis.	N/A			X	Minor corrosion, scratches, etc.
03-058		N/A			X	
03-059	Surf.-PT	N/A			X	Porosity
03-060		N/A			X	
03-061		N/A			X	
03-062		N/A			X	



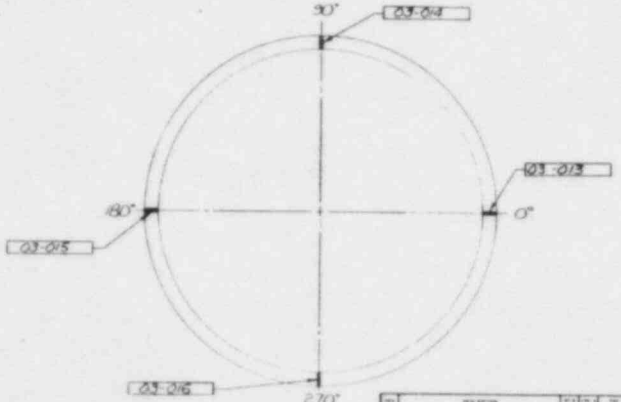
SECTION AA
SCALE 1"=1'0"



SECTIONAL ELEVATION
SCALE 1"=1'0"



SECTION BB
SCALE 1"=1'0"

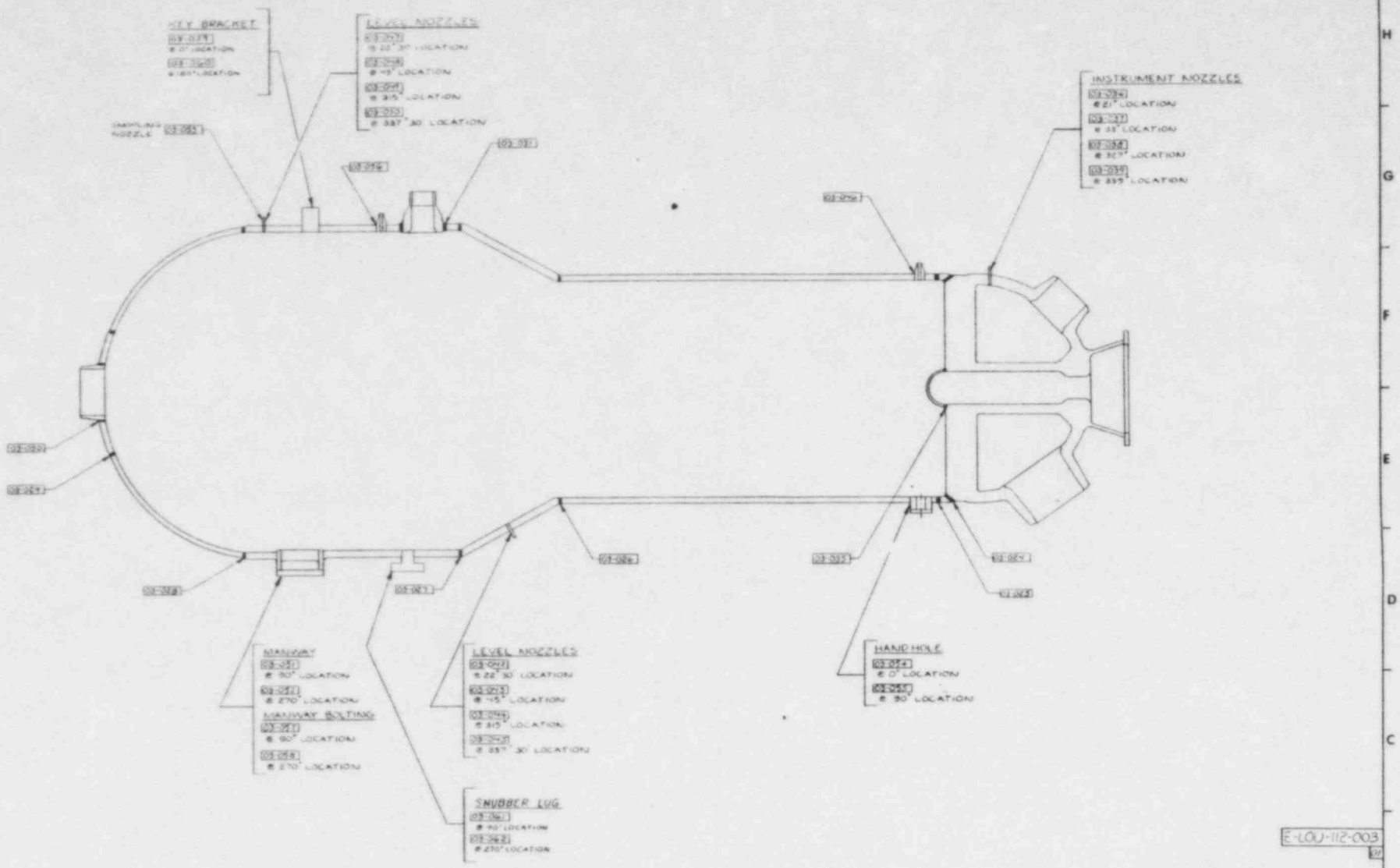


SECTION CC
LOWER EXTENSION RING
(SCALE NONE)

E-LOU-112-003
01

ZONE 03 UNIT 1
STEAM GENERATOR
WELD DESIGNATIONS

E-LOU-112-003 01



E-LOU-112-003

8	7	6	5	4	3	2	1	H	G	F	E	D	C	B	A

STEAM GENERATOR #2 EXAMINATION AREAS

Area Number	Area Description
04-001	Support Skirt Weld
04-002	Stay Cylinder Base-Hemisphere Weld
04-003 ↓ 04-007	Peel Segment Welds
04-008	Hemisphere-Extension Ring Weld
04-009	Extension Ring-Tube Sheet Weld
04-010 ↓ 04-012	Nozzle-Hemisphere Welds
04-013 ↓ 04-016	Extension Ring Longitudinal Welds
04-017 ↓ 04-018	Clad Patches
04-019 ↓ 04-021	Nozzle Inner Radius Areas
04-024	Extension Ring-to-Tube Sheet Weld
04-025	Extension Ring-to-Lower Shell Weld
04-026	Intermediate Shell-to-Cone Weld
04-027	Cone-to-Upper Shell Weld
04-028	Upper Shell-to-Top Head Weld
04-029	Top Head Dome-to-Torus Weld
04-030	Steam Nozzle-to-Top Head Weld

STEAM GENERATOR #2 EXAMINATION AREAS

Area Number	Area Description
04-031	Feedwater Nozzle-to-Shell Weld
04-057	Manway
04-058	
04-059	Support Lugs
04-060	
04-061	
04-062	

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
ZONE 4 STEAM GENERATOR # 2						
04-001	Vol. -UT	248-6	0°			
		248-7	45°			
		248-8	60°			
04-002		248-1	0°			
		248-4	45°			
		248-5	60°			
04-003		248-3	0°			
		248-4	45°			
		248-5	60°			
04-004		248-2	0°			
		248-4	45°			
		248-5	60°			
04-005		248-1	0°			
		248-4	45°			
		248-5	60°			
04-006		248-3	0°			

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
04-006	Vol. -UT	248-4	45°			
		248-5	60°			
04-007		248-3	0°			
		248-4	45°			
		248-5	60°			
04-008		247-1,2	0°			
		247-3	45°			
		247-4,5	60°			
04-009		247-1,2	0°			
		247-3		45°		
		247-4,5	60°			
04-010		248-1	0°			
		248-4		45°		
		248-5		60°		
04-011		248-2	0°			
		248-4		45°		
		248-5		60°		

NON-DESTRUCTIVE EXAMINATION SUMMARY

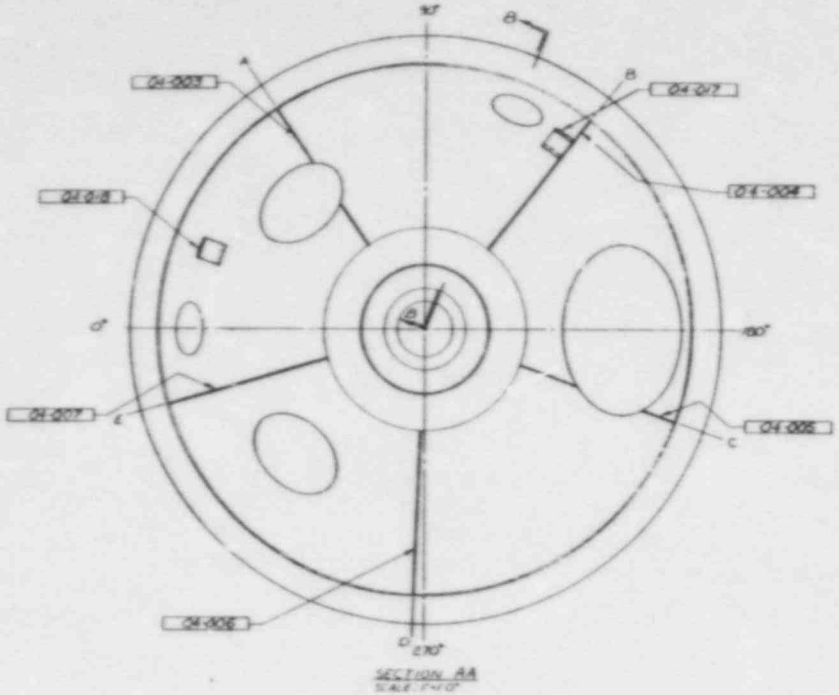
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
04-012	Vol. -UT	248-2	0°			
		248-4		45°		
		248-5		60°		
04-013		247-1	0°			
		247-3	45°			
		247-4	60°			
04-014		247-1	0°			
		247-3	45°			
		247-4	60°			
04-015		247-1	0°			
		247-3	45°			
		247-4	60°			
04-016		247-2	0°			
		247-3	45°			
		247-4	60°			
04-017	Vis.	N/A			X	Minor gouges, grind marks, scratches
04-018		N/A			X	

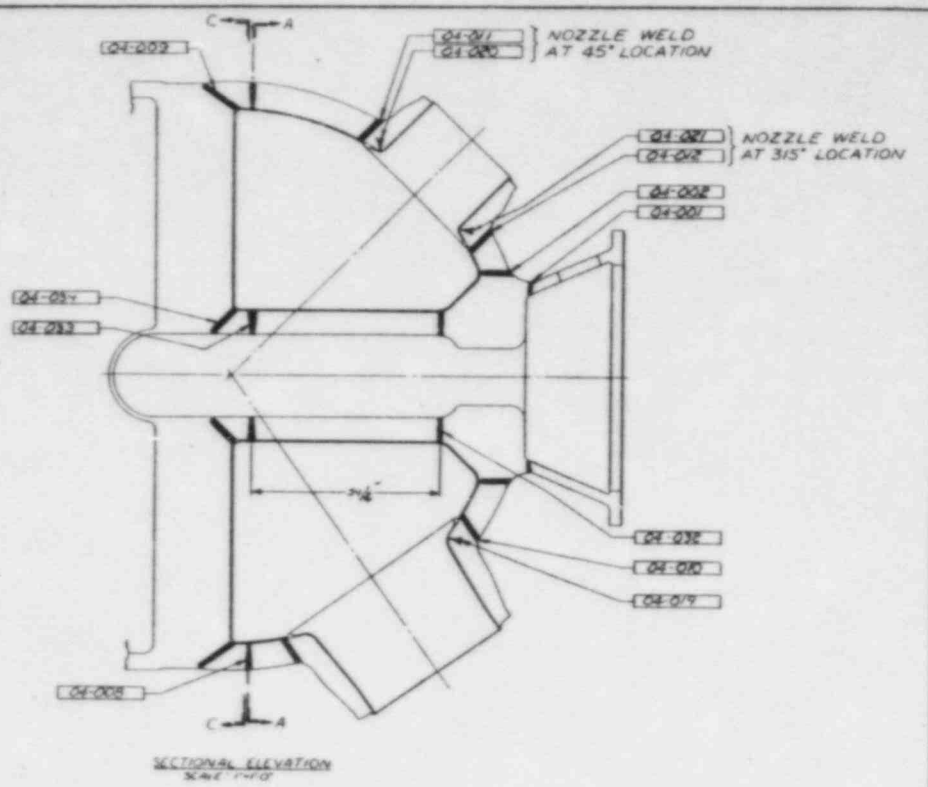
NON-DESTRUCTIVE EXAMINATION SUMMARY

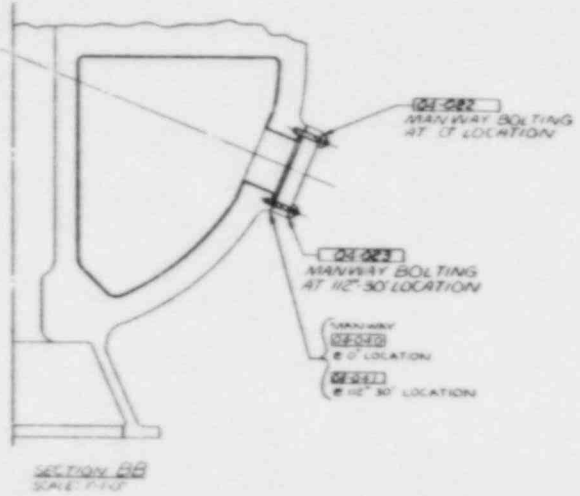
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
04-019	Vol. -UT	251-1	45°			
04-020		↓	↓			
04-021						
04-024		264-1,2	0°			
		264-5	45°			
		264-6	60°			
04-025		264-1,2	0°			
		264-5	45°			
		264-6	60°			
04-026		264-1,2,4,14A	0°			
		264-7,13	45°			
		264-8,14	60°			
04-027		264-1,2,4	0°			
		264-7,9,13	45°			
		264-8,10,14	60°			
04-028		264-1,2,4A	0°			
		264-9,11	45°			
	↓	264-10,12	60°			

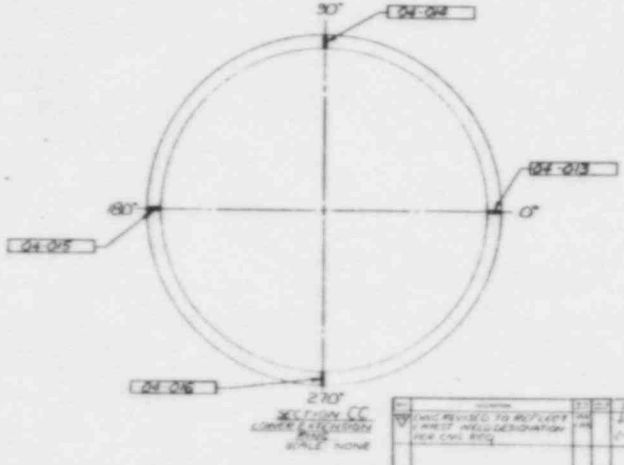
NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
04-029	Vol. -UT	264-3	0°			
		264-11	45°			
		264-12	60°			
04-030		264-3	0°			
		264-11	45°			
		264-12	60°			
04-031		264-1	0°			
		264-9	45°			
		264-10	60°			
04-057	Vis.	N/A			X	Minor grind marks, scratches, etc.
04-058		N/A			X	
04-059	Surf.-PT	N/A	X			Initially rejected; ground to acceptable condition.
04-060		N/A	X			
04-061		N/A	X			
04-062		N/A	X			

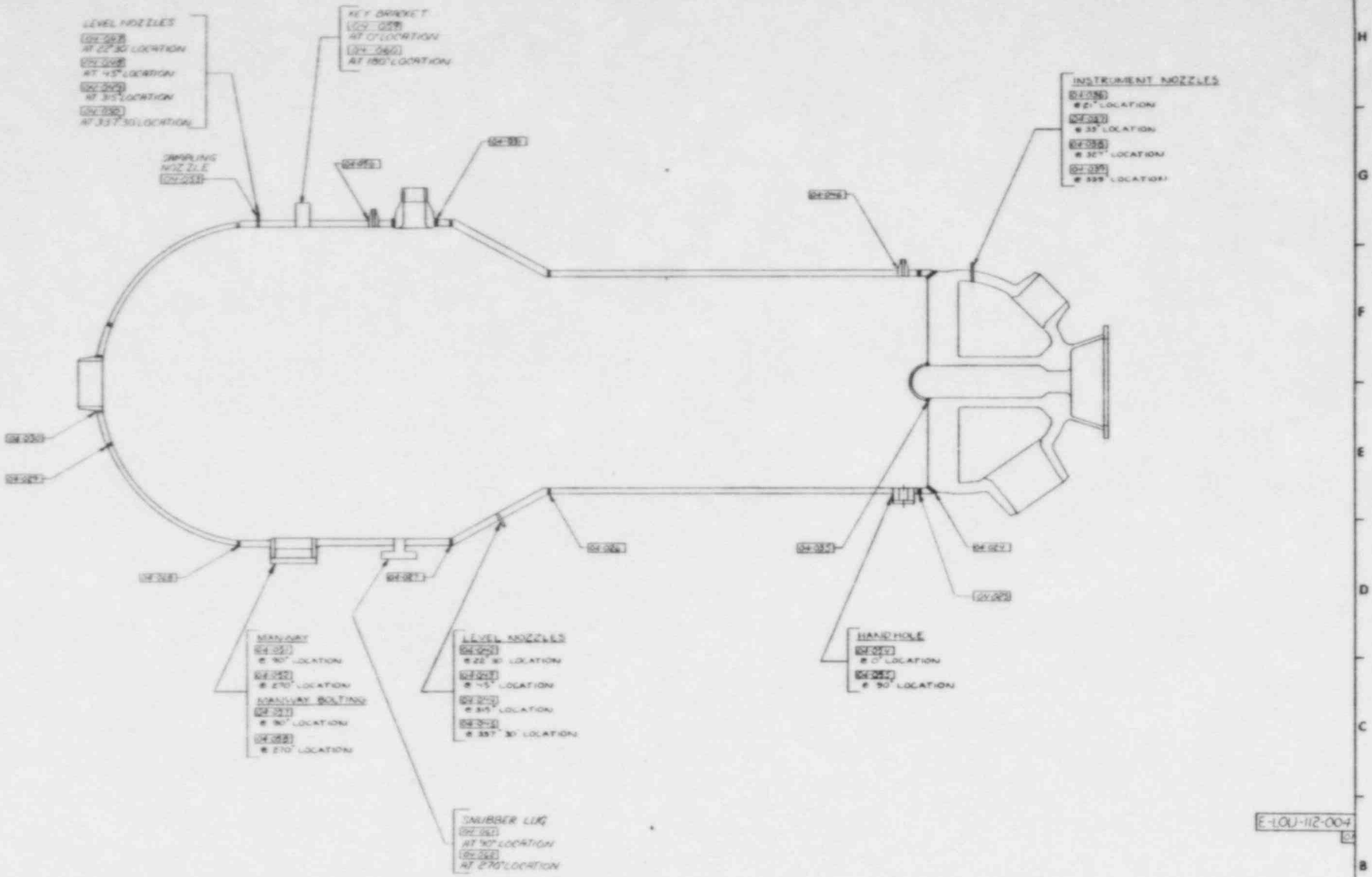

90°
B
04-003
04-017
04-004
04-018
0°
180°
04-007
04-005
04-006
270°
SECTION AA
SCALE: 1"=1'-0"


C
A
04-002
04-011
04-020
NOZZLE WELD
AT 45° LOCATION
04-021
04-012
NOZZLE WELD
AT 315° LOCATION
04-022
04-001
04-031
04-033
04-032
04-010
04-019
04-008
SECTIONAL ELEVATION
SCALE: 1"=1'-0"


04-032
MANWAY BOLTING
AT 0° LOCATION
04-023
MANWAY BOLTING
AT 112° 30' LOCATION
@ 0° LOCATION
@ 112° 30' LOCATION
SECTION BB
SCALE: 1"=1'-0"


90°
04-014
180°
0°
04-013
04-015
04-016
270°
SECTION CC
LOWER ATTENUATION
RING
SCALE: NONE

E-LOU-112-004


LEVEL NOZZLES
(24-203) AT 22°30' LOCATION
(24-204) AT 45° LOCATION
(24-205) AT 315° LOCATION
(24-206) AT 337°30' LOCATION
KEY BRACKET
LUG (24-219) AT 0° LOCATION
(24-220) AT 180° LOCATION
SAMPLING NOZZLE (24-233)
(24-215)
(24-216)
(24-246)
INSTRUMENT NOZZLES
(24-236) @ 2° LOCATION
(24-237) @ 33° LOCATION
(24-238) @ 327° LOCATION
(24-239) @ 359° LOCATION
(24-230)
(24-234)
(24-235)
(24-226)
(24-227)
(24-228)
(24-229)
MANWAY
(24-251) @ 90° LOCATION
(24-252) @ 270° LOCATION
MANWAY BOLTING
(24-221) @ 90° LOCATION
(24-222) @ 270° LOCATION
LEVEL NOZZLES
(24-240) @ 22.5° LOCATION
(24-241) @ 45° LOCATION
(24-242) @ 315° LOCATION
(24-243) @ 337.5° LOCATION
HAND HOLE
(24-247) @ 0° LOCATION
(24-248) @ 180° LOCATION
SNUBBER LUG
(24-261) AT 90° LOCATION
(24-262) AT 270° LOCATION
E-LOU-112-004
8
7
6
5
4
3
2
1
H
G
F
E
D
C
B
A

PRESSURIZER EXAMINATION AREAS

Area Number	Area Description
05-001	Support Skirt Weld
05-002	Bottom Head-Shell Circumferential Weld
05-003	Lower Shell Longitudinal Welds
05-004	↓
05-005	Lower Shell-Upper Shell Circumferential Weld
05-006	Upper Shell Longitudinal Welds
05-007	↓
05-008	Upper Shell-Top Head Circumferential Weld
05-009	Surge Nozzle-Bottom Head Weld
05-010	Spray Nozzle-Top Head Weld
05-011	Safety Nozzle-Top Head Welds
↓	↓
05-013	
05-014	Surge Nozzle Inner Radius Area
05-015	Spray Nozzle Inner Radius Area
05-016	Safety Nozzle Inner Radius Areas
↓	↓
05-018	
05-019	Clad Patch

NON-DESTRUCTIVE EXAMINATION SUMMARY

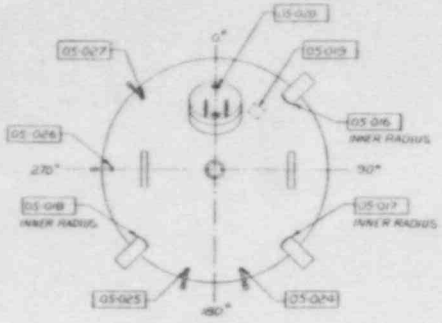
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
ZONE 5 PRESSURIZER						
05-001	Vol. -UT	243-3	0°			
		243-2	45°			
		243-1	60°			
05-002		242-2	0°			
		242-6	45°			
		242-7	60°			
05-003		242-1	0°			
		242-4	45°			
		242-5	60°			
05-004		242-1,10	0°			
		242-4,6	45°			
		242-5,7	60°			
05-005		242-1,10	0°			
		242-4	45°			
		242-5,7	60°			
05-006		242-1,10	0°			

NON-DESTRUCTIVE EXAMINATION SUMMARY

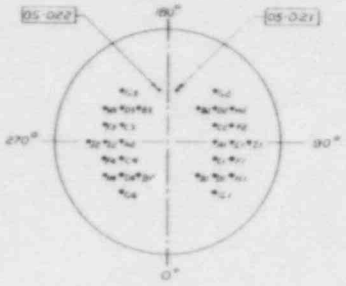
Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
05-006	Vol. -UT	242-4,6	45°			
		242-5,7	60°			
05-007		242-3	0°			
		242-4,6	45°			
		242-5,7	60°			
05-008		242-2,3	0°			
		242-9	45°			
		242-8	60°			
05-009		242-2	0°			
		242-6	45°			
		242-7	60°			
05-010		242-2	0°			
		242-6	45°			
		242-7	60°			
05-011		242-3	0°			
		242-6	45°			
		242-7		60°		

NON-DESTRUCTIVE EXAMINATION SUMMARY

Examination Area	Examination Method	Examination Data Sheet Number(s)	Examination Results			Remarks
			No Indications	Significant Indications		
				Geometrical	Other	
05-012	Vol. -UT	242-2	0°			
		242-6	45°			
		242-7		60°		
05-013		242-2			0°	Small lamination
		242-6	45°			
		242-7		60°		
05-014		245-2	70°			
05-015		245-1	60°			
05-016		245-3	60°			
05-017						
05-018						
05-019	Vis.	N/A	X			

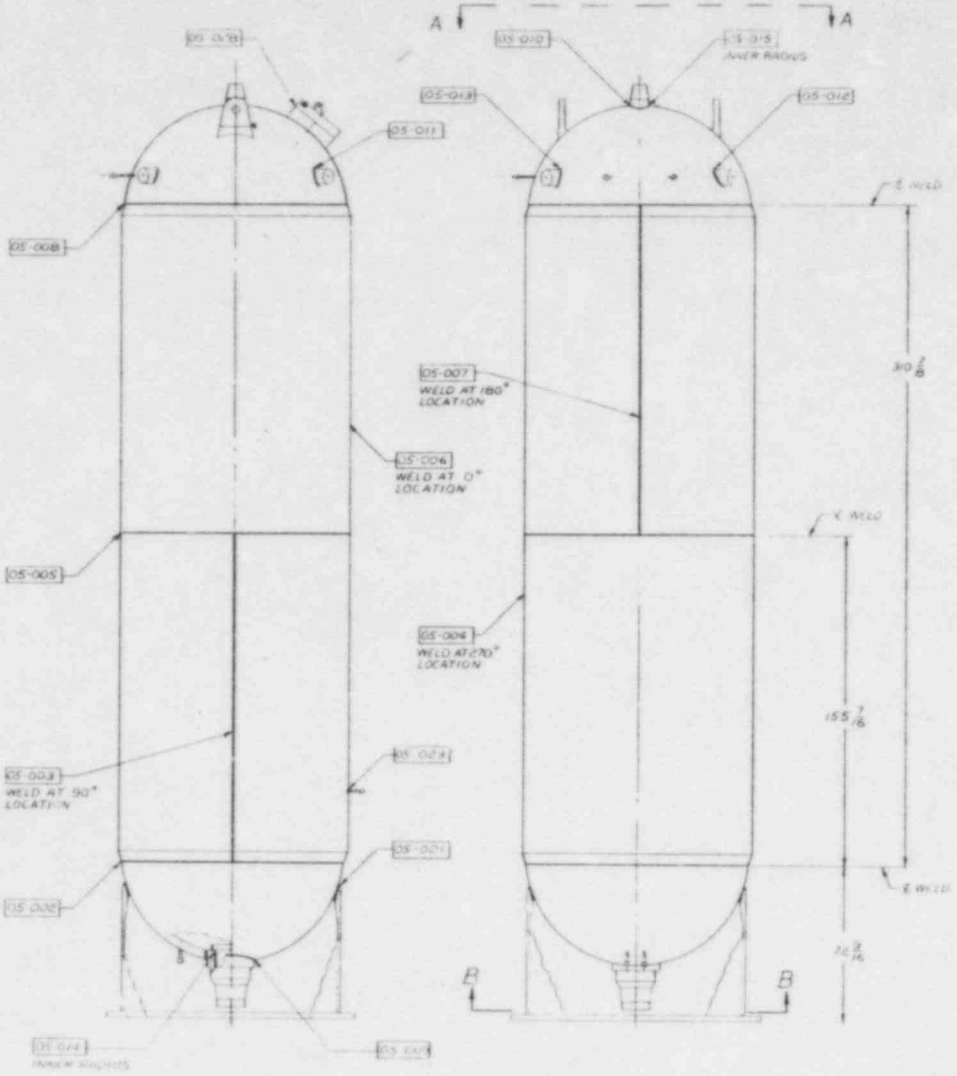


TOP HEAD PENETRATIONS
VIEW A-A



BOTTOM HEAD PENETRATIONS
VIEW B-B

HEATER CONNECTION WELD DESIGNATIONS					
A1	05-H-01	D1	05-H-11	G1	05-H-21
A2	02	D2	12	G2	22
B1	03	D3	13	G3	23
B2	04	D4	14	G4	24
B3	05	E1	15	H1	25
B4	06	E2	16	H2	26
C1	07	E3	17	H3	27
C2	08	E4	18	H4	28
C3	09	F3	19	I1	29
C4	05-H-10	F4	05-H-20	I2	05-H-30



90° SIDE

180° SIDE

PRESSURIZER ELEVATION

E-LOO-112-005

ZONE 05
PRESSURIZER
WELD DESIGNATION
E-LOO-112-005

AEROTECH LABORATORIES
DIVISION OF KRAUTKRAMER . BRANSON. INCORPORATED

P. O. Box 350
LEWISTOWN PENNSYLVANIA 17044

TELEPHONE: 717 . 242-0327

OCT 23 1974

October 21, 1974

Conam Inspection
P. O. Box 183
Rahway, NJ 07065

Ref: Conam P.O. #2750 & #2755

Aerotech Laboratories hereby certifies that the following transducers per the above purchase orders meet all standard Aerotech Laboratories' specifications.

Purchase order #2750:

Item #1, Quantity - 2, Gamma MSWS, 2.25 MHz, ½ x ½, S/N's: I20402 & I20403

Item #2, Quantity - 2, Gamma MSWS, 5.0 MHz, ½ x ½, S/N's: I20401 & I20404

#4, Quantity - 2, Gamma MSWS, 2.25 MHz, ½ x ½, S/N's: I20405 & I20406

Purchase order #2755:

Item #1, Quantity - 3, Gamma SWS, 2.25 MHz, ½ x 1, S/N's: I30401, I30402, & I30403

Item #2, Quantity - 3, Gamma SWS, 2.25 Mhz, ½ x 1, S/N's: I30404, I30405, & I30406

Each transducer has been certified on the basis of sensitivity, resolution (damping), per real time wave form, signal to noise ratio, and frequency spectrum including center frequency.

The equipment used for this certification was an Aerotech Ultrasonic Transducer Analyzer, Model UTA-3, Model 180 Hewlett Packard Oscilloscope, and a Model 141 Hewlett Packard Spectrum Analyzer.

Very truly yours,

AEROTECH LABORATORIES
Division of Krautkramer-Branson, Inc.

Thomas R. Martin/cp

THOMAS R. MARTIN
Sales Manager

TRM/cp

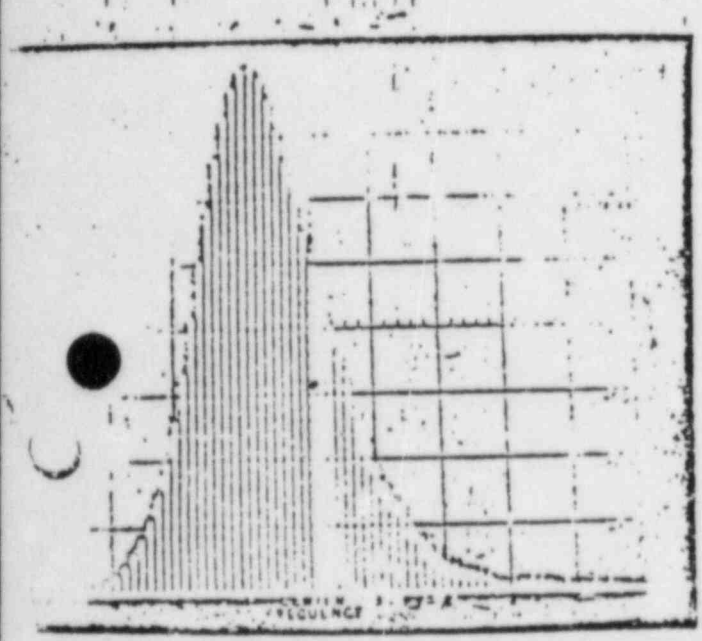
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1383 WITHERSPOON ST./BOX 158 RAHWAY, NEW JERSEY 07065 U.S.A.

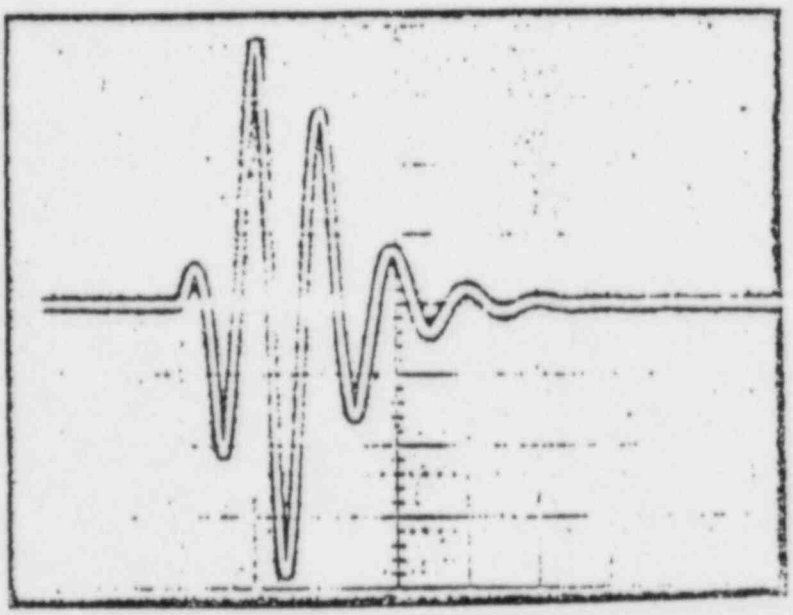
FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: ARCO Tech S/N 015530

MARKED FREQUENCY: 2.25 MHz SIZE: 0.5"

DATA SUPPLIED BY: ARCO Tech Laboratories





015530

RESULTS

Central Scale Frequency 2.5 MHz (.5 MHz/Division)

Transducer Central Frequency 2.1 MHz

☒ Acceptable

☐ Unacceptable

Interpretation By F.T. Cahill

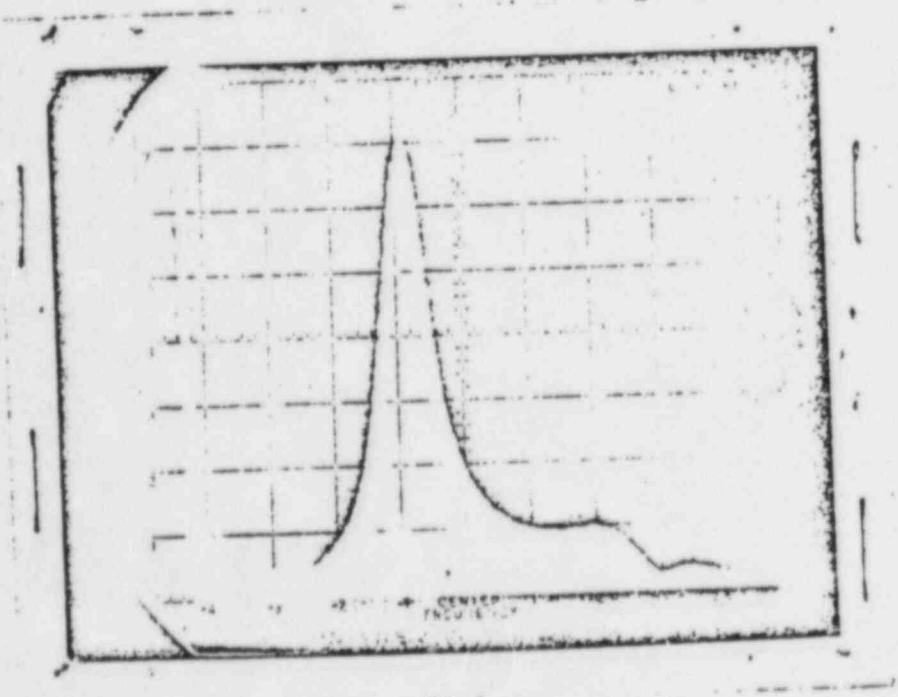
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1305 WITHERSPOON ST./BOX 185
PARKWAY, NEW JERSEY 07065 U.S.A.
201-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 20780

MARKED FREQUENCY: 2.25 MHz SIZE: .5 x 1.0"

DATA SUPPLIED BY: Automation Industries



RESULTS

Contral Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.1 MHz

[x] Acceptable

[ ] Unacceptable

5/20/75

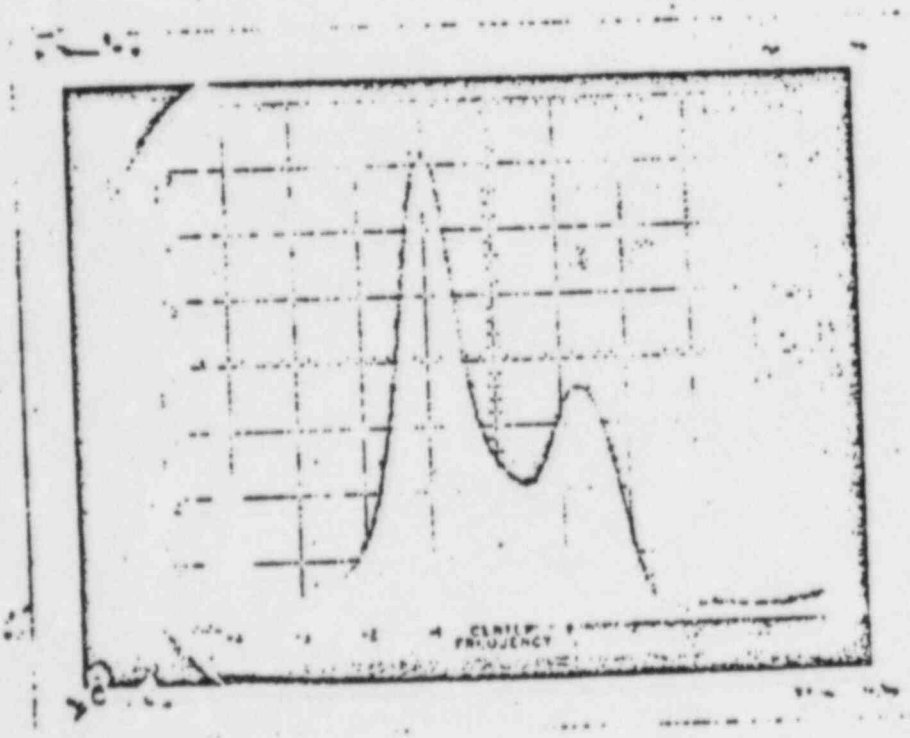
CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: AUTOMATION INDUSTRIES S/N 20825

MARKED FREQUENCY: 2.25 MHz SIZE: 0.5" X 1.0"

DATA SUPPLIED BY: Automation Industries



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.0 MHz

[X] Acceptable

[ ] Unacceptable

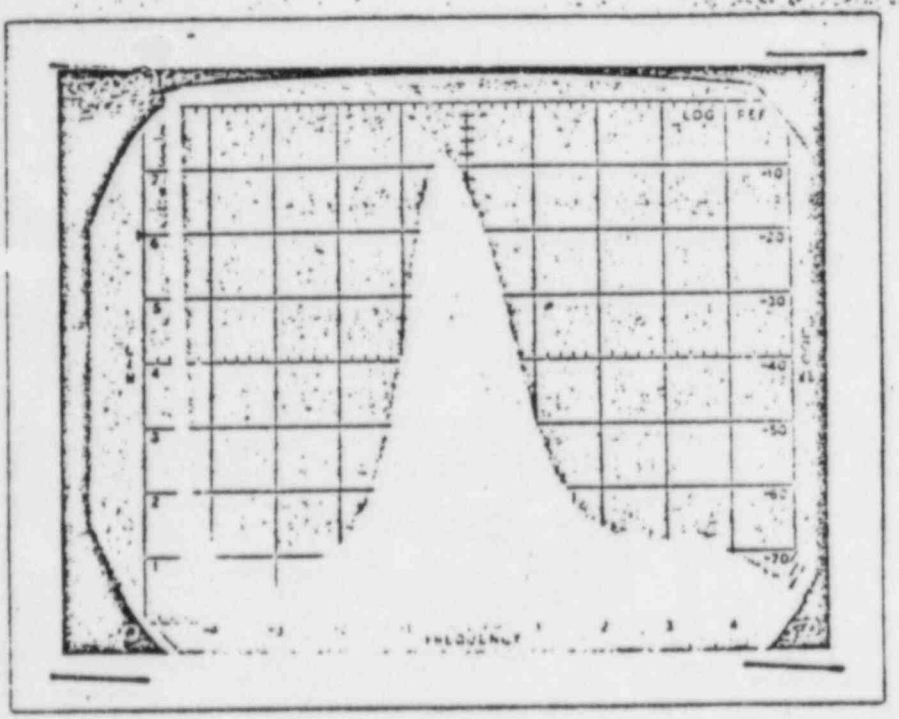
Interpretation By 2Lt Bart . II 9 MAY 1975
D.D. MacGill

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5MHz
Dispersion .5MHz/cm
Vertical Display Mode-Linear

Excitation pulse 10N52 TRANS JACK
THRU Pos on UM7759
57B4823 Receiver

Serial No. 26586



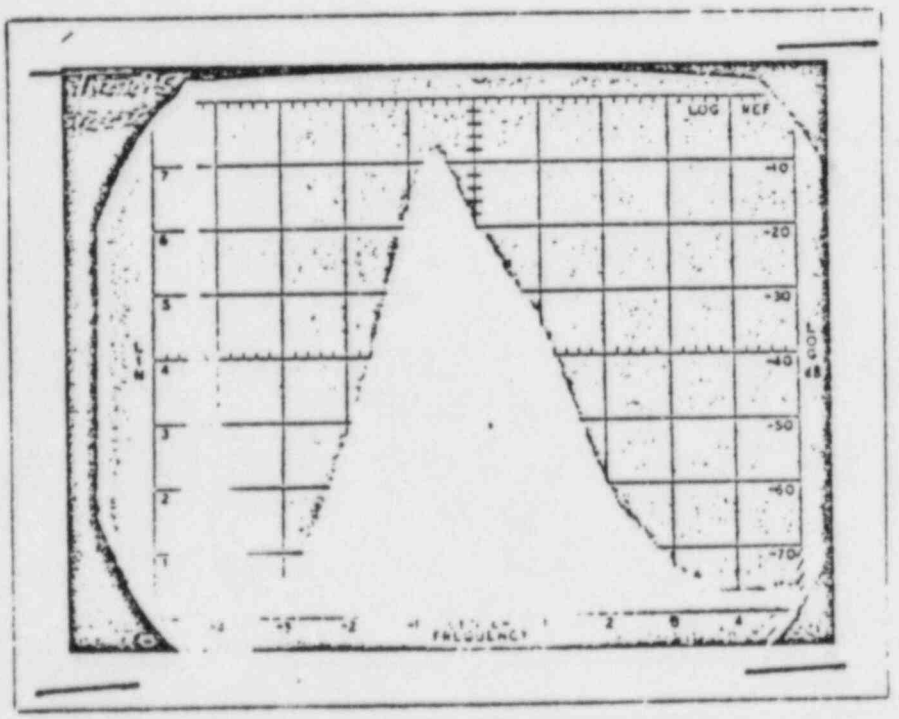
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5MHz
Dispersion .5MHz/cm
Vertical Display Mode-Linear

Excitation pulse 10N#2 TRANS JACK
THRU 80S. ON UM77SB

Serial No. 27245



TRANSMITTED SPECTRUM

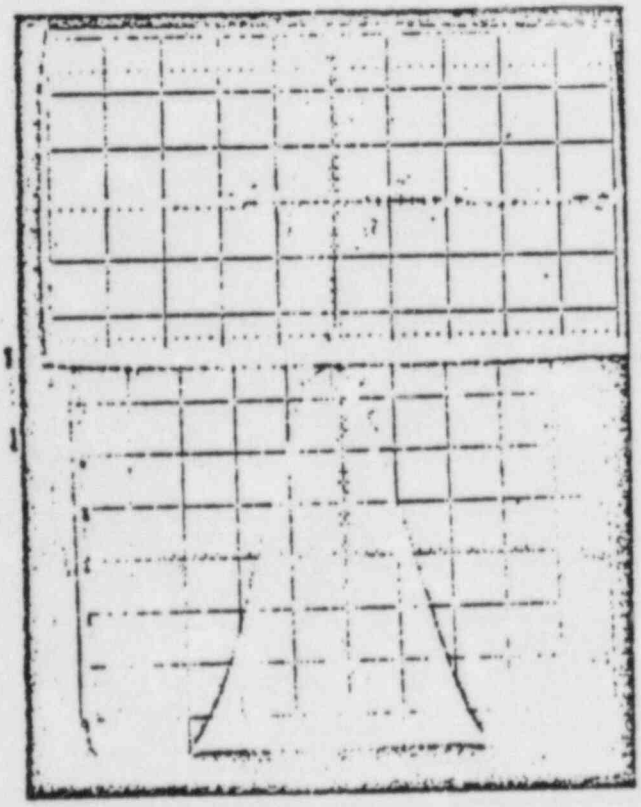
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1305 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 27877

MARKED FREQUENCY: 2.25 MHz SIZE: .5"

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.4 MHz

[XX] Acceptable

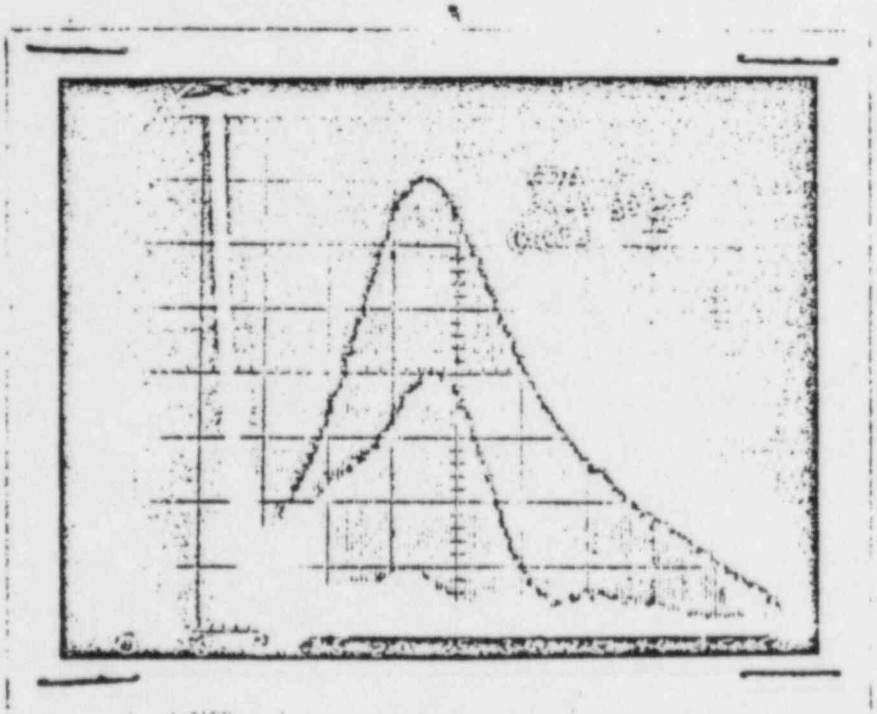
[__] Unacceptable

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/cm
Vertical Display Mode-Linear
Receiver 57A4823

Excitation pulse Broad Band Spike
Details/Remarks P/E AIL Ultrasonic Profiler.

Serial No. 33632



TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4023

Excitation pulse 2.25 J/m775
Details/Remarks

Serial No. 33637

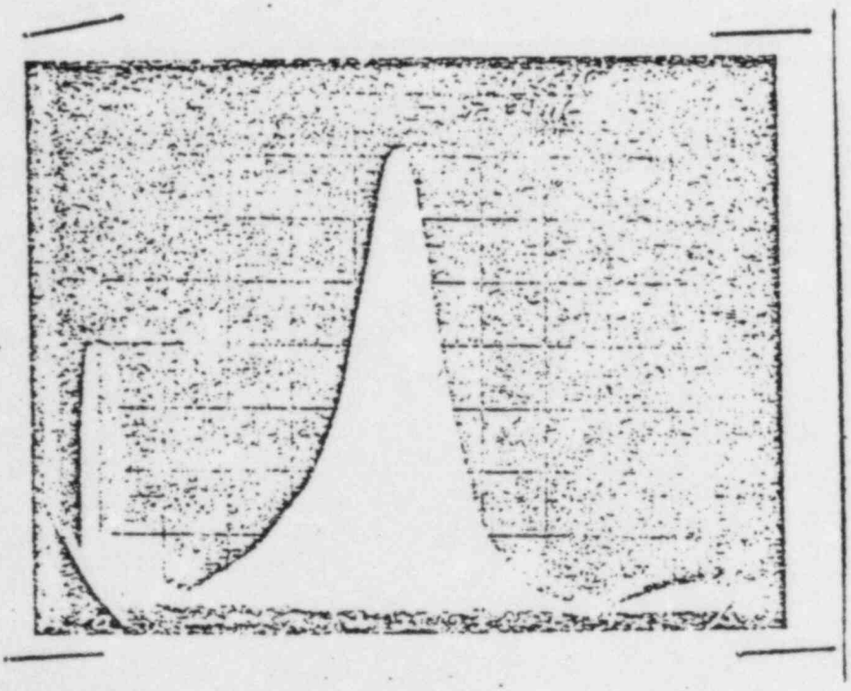
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4823

Excitation pulse_____
Details/Remarks P/P-2.2db db

Serial No. 34916



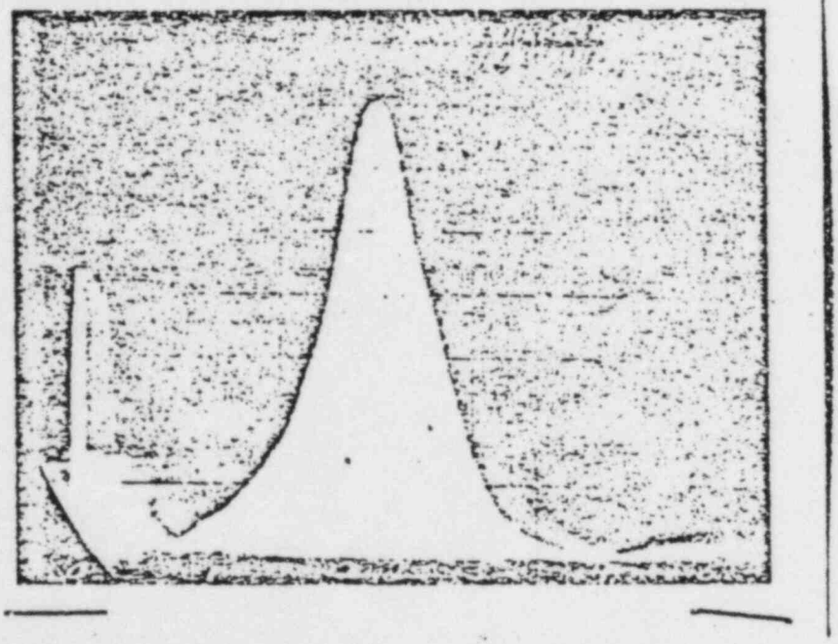
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4823

Excitation pulse_____
Details/Remarks P/P - 2.25 N ab.

Serial No. 34917



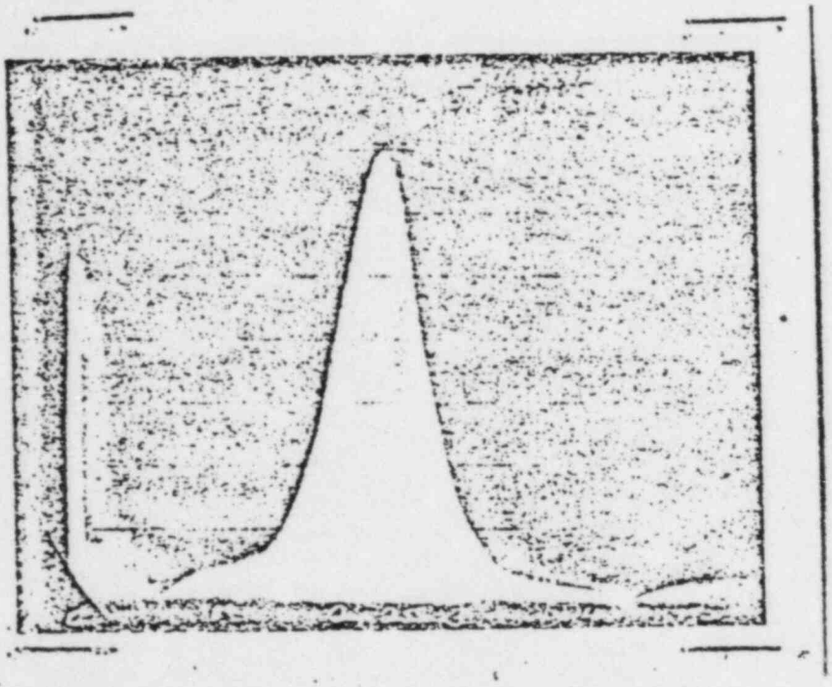
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4823

Excitation pulse_____
Details/Remarks 1/2 2.25 MHz.

Serial No. 34918



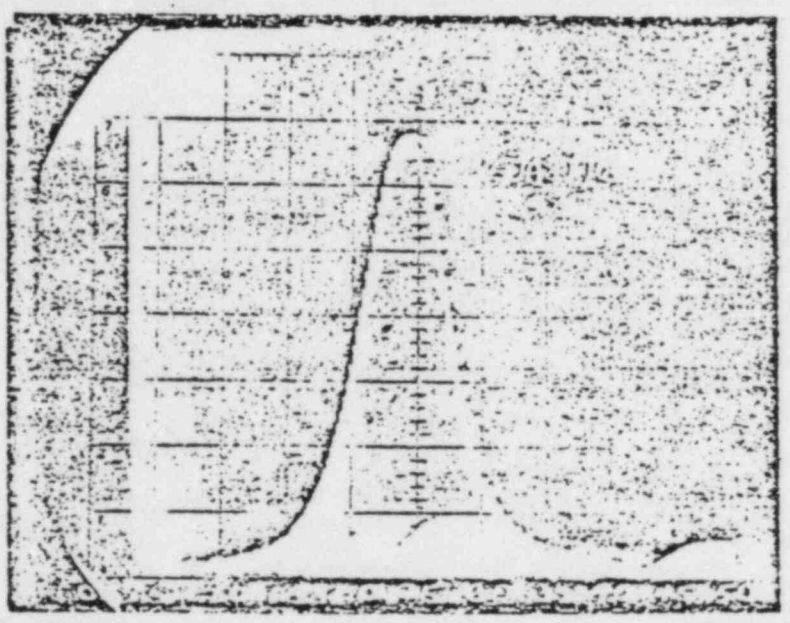
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mono- Linear
Receiver- 57A823

Excitation pulse_____
Details/Remarks H/U-2.25 usec

Serial No. 36587



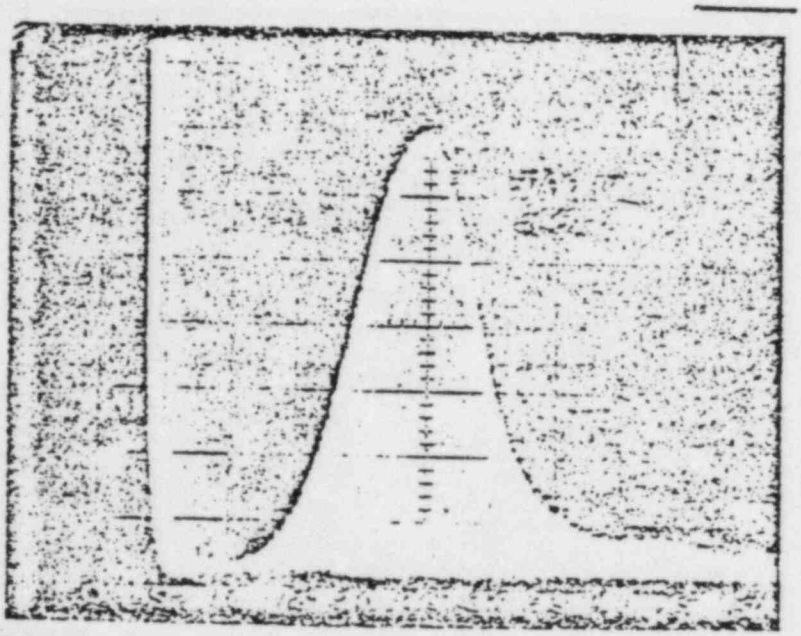
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4323

Excitation pulse_____
Details/Remarks 1/2-0.25 usec

Serial No. 36589



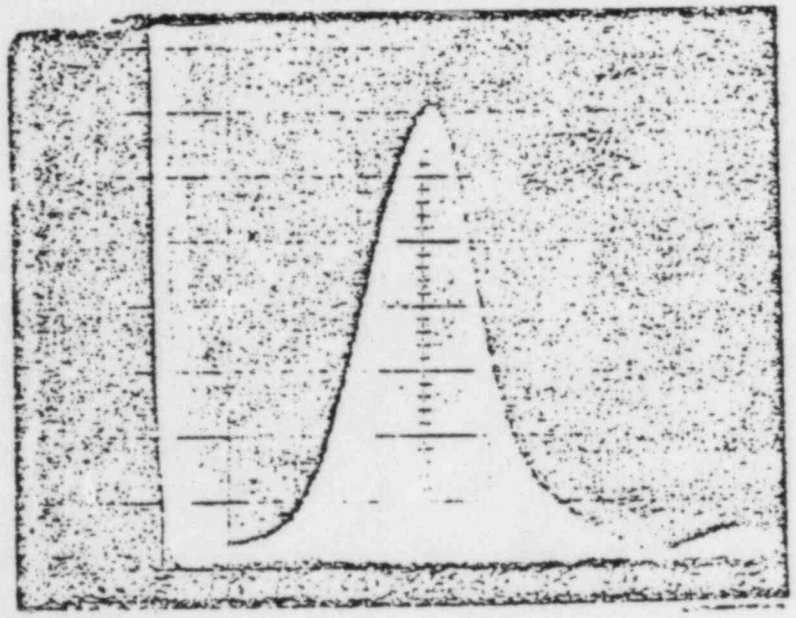
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4823

Excitation pulse_____
Details/Remarks 1/4 0.25 width

Serial No. 36590



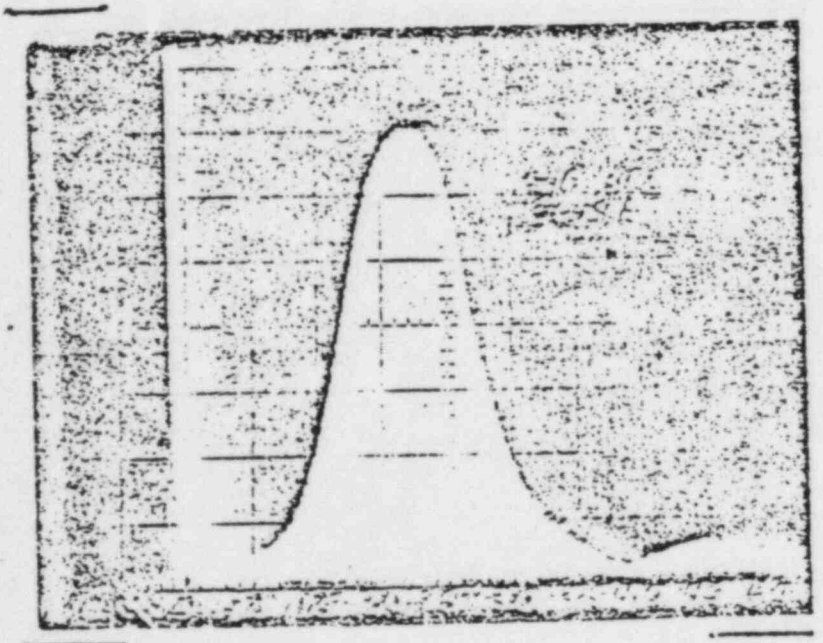
TRANSMITTED SPECTRUM

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 2.5 MHz
Dispersion 0.5 MHz/ cm
Vertical Display Mode- Linear
Receiver- 57A4925

Excitation pulse_____
Details/Remarks W-2.25 wdb.

Serial No. 36591



TRANSMITTED SPECTRUM

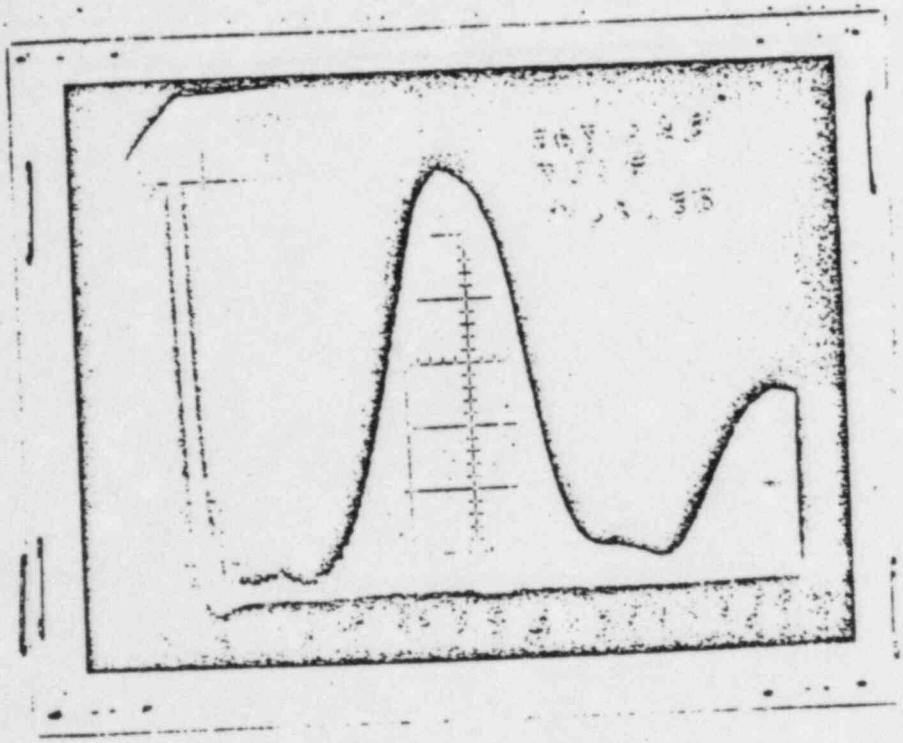
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1305 WITHERSPOON ST./BOX 183
RAHWAY, NEW JERSEY 07065 U.S.A.
381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 38250

MARKED FREQUENCY: 2.25 MHz SIZE: .5 x 1.0"

DATA SUPPLIED BY: Automation Industries



RESULTS

Contral Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.3 MHz

[XX] Acceptable

[__] Unacceptable

Interpretation By F.T. CARR 8/1

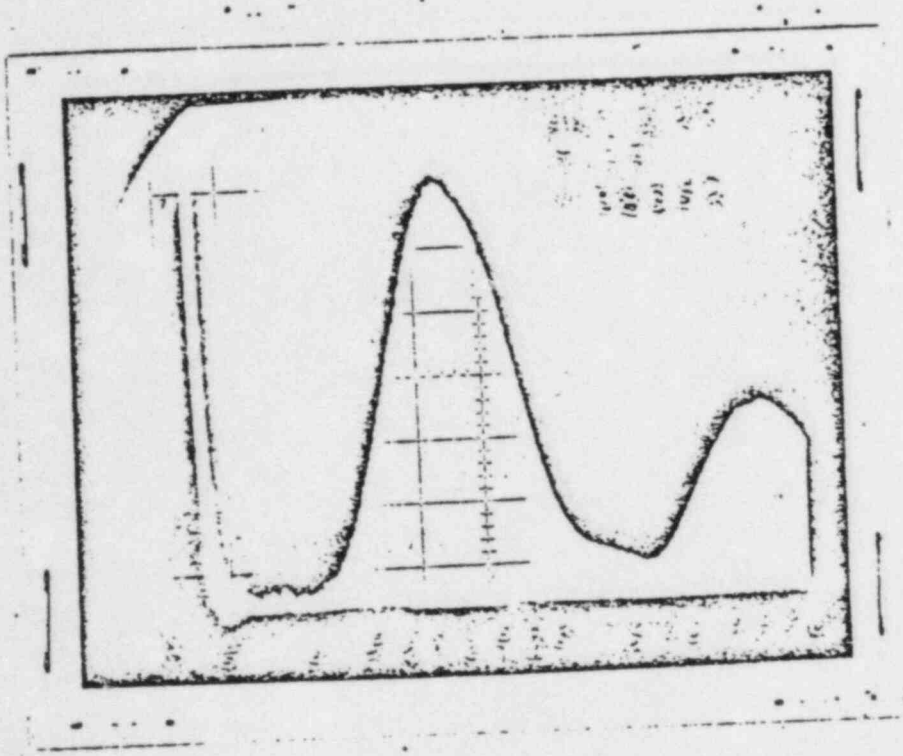
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST / BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
[illegible]-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 38252

MARKED FREQUENCY: 2.25 MHz SIZE: 0.5 x 1.J"

DATA SUPPLIED BY: Automation Industries



RESULTS

Contral Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.2 MHz

[XX] Acceptabl

[__] Unacceptable

SEARCH UNIT ACOUSTICAL ANALYSIS

Frequency, Damping Factor, Beam Width/Dia., Focal Length, Beam Symmetry

SERIAL NO. 38519 DATE 6-25-75

TYPE SIL ____ SIQ ____ SIZ ____ Other SF2 PART NUMBER 5214214

FREQUENCY 2.25 ____ mc 5 ✓ mc 10 ____ mc 15 ____ mc 20 ____ mc 25 ____ mc Other ____

CRYSTAL SIZE 1/4" CRYSTAL LI_2SO_4 ____ Quartz ____ Ceramic ✓

LENS RADIUS OF CURVATURE FLAT INSPECTOR Kim

REFLECTORS Steel Ball .500"Dia. Steel Wire ____"Dia. Other FLAT GLASS BLOCK

A. F.G.B. B. BALL C. BALL

DRIVER PULSE
Duration: 0.025 ____ microseconds
0.050 ____ microseconds
0. 020 ____ microseconds

AMPLITUDE
150 volts

CRYSTAL OUTPUT 680 millivolts

THIS IS A
Preliminary Inspection ____
Final Inspection ✓

CONNECTION CABLES

	Length	Type
Pulser to Crystal	4'	RG62
Receiver to Scope	3'	RG62

*NOTE: Water path as stated below is not at focal length. It is an operational setting.

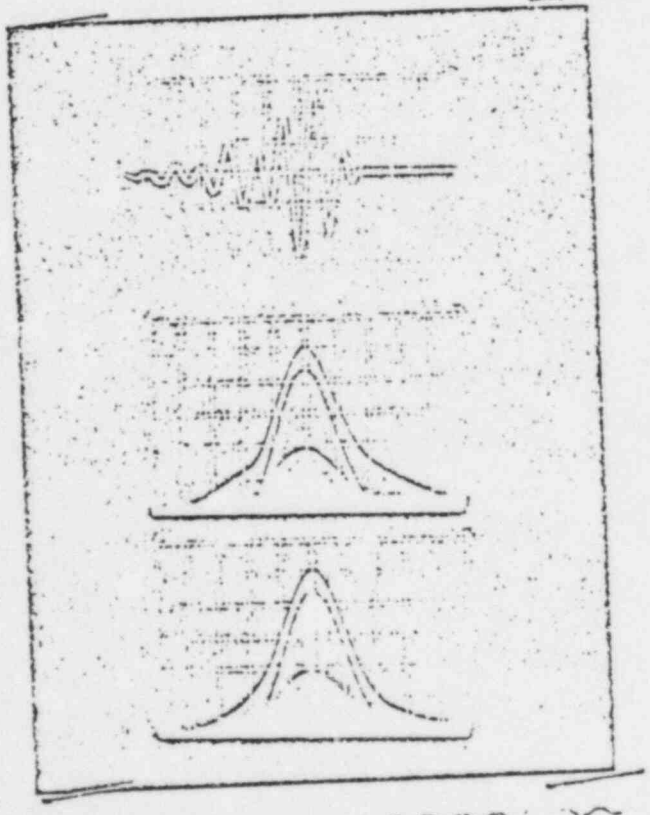
TRACE

A.
0.3 microseconds
1.0 volts

B.
10 microsec/cm
1.0 volts/cm
.030 inch/div.

C.
10 microsec/cm
1.0 volts/cm
.030 inch/div.

D. & E.
____ microsec/cm
____ volts/cm
____ inch/div.
Target ____



Measured Frequency 5 mc
Trace A.

Focal Length ____ inch
*Water Path 1.33 inch
46 microsec water path
(round trip time)

Damping Factor 4.5
Trace A.

Beam Width or Dia. .048
inches 3 db Amp.
Points
Trace B.

Beam Symmetry:
Length V.S. Amp. ____
270°-300° ____
Trace C
180°-360° ____
Trace B

46.87 dB

Remarks: ____

AUTOMATION INDUSTRIES, INC.

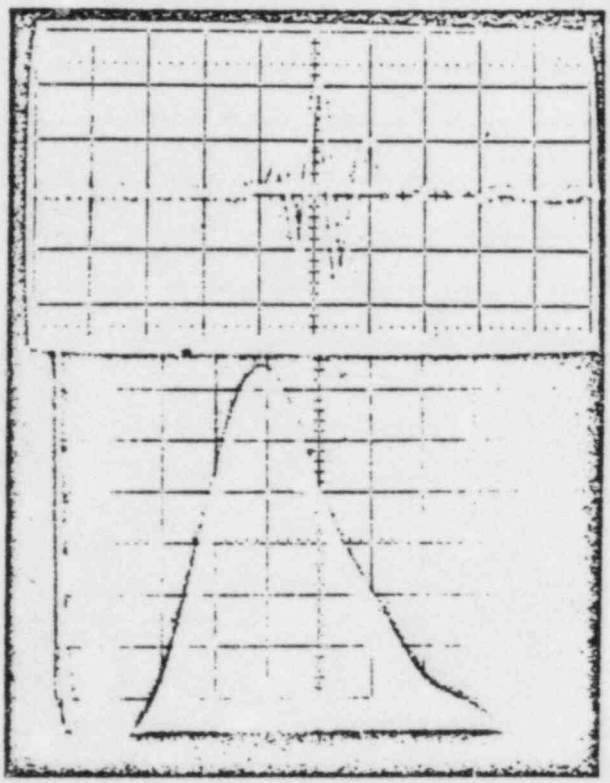
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 168
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 40058

MARKED FREQUENCY: 2.25 MHz SIZE: .75"

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.0 MHz

[XX] Acceptable

[__] Unacceptable

Interpretation By

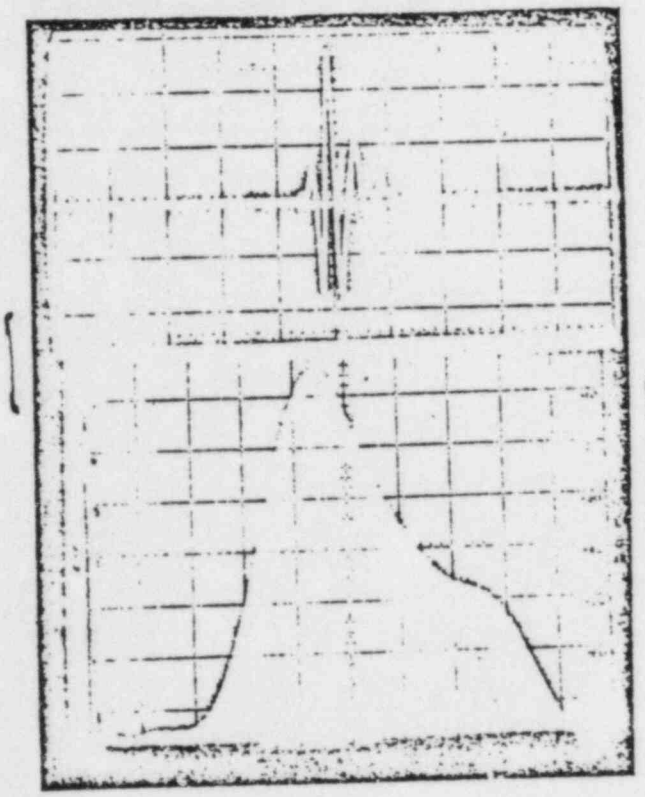
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 40362

MARKED FREQUENCY: 2.25 MHz SIZE: .75"

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.2 MHz

[XX] Acceptable

[__] Unacceptable

Interpretation By [signature] P.T. CA[illegible] 8/1/75

SEARCH UNIT ACOUSTICAL ANALYSIS

Frequency, Damping Factor, Beam Width/Dia., Focal Length, Beam Symmetry

SERIAL NO. 40437 DATE 6-25-75

TYPE SIL ____ SIQ ____ SIZ ____ Other SF2 PART NUMBER 5742216

FREQUENCY 2.25 ____ mc 5 ✓ mc 10 ____ mc 15 ____ mc 20 ____ mc 25 ____ mc Other ____

CRYSTAL SIZE 3/8" CRYSTAL LI_2SO_4 ____ Quartz ____ Ceramic ✓

LENS RADIUS OF CURVATURE FLAT INSPECTOR KIM

REFLECTORS Steel Ball .500" Dia. Steel Wire ____" Dia. Other FLAT GLASS BLOCK

A. F.G.B. B. BALL C. BALL

DRIVER PULSE

Duration: 0.025 ____ microseconds
0.050 ____ microseconds
0. 020 microseconds

AMPLITUDE

150 volts

CRYSTAL OUTPUT 1250 millivolts

THIS IS A
Preliminary Inspection ____
Final Inspection ✓

CONNECTION CABLES

	Length	Type
Pulser to Crystal	4'	RG62
Receiver to Scope	3'	RG62

*NOTE: Water path as stated below is not at focal length. It is an operational setting.

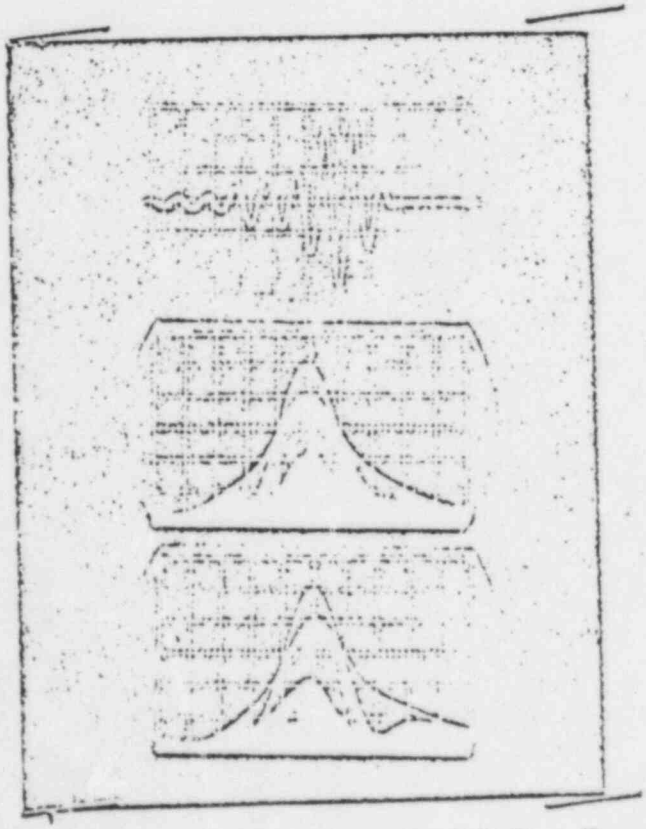
TRACE

A.
0.2 microseconds
1.0 volts

B.
20 microsec/cm
1.0 volts/cm
.045 inch/div.

C.
30 microsec/cm
1.0 volts/cm
.045 inch/div.

D. & E.
____ microsec/cm
____ volts/cm
____ inch/div.
Target ____



Measured Frequency 5.5 mc
Trace A.

Focal Length ____ inch
*Water Path 3.0 inch
104 microsec water path
(round trip time)

Damping Factor 4.0
Trace A.

Beam Width or Dia. .073
inches 3 db Amp.
Points
Trace B.

Beam Symmetry:
Length V.S. Amp. ____
270°-90° ____
Trace C
180°-360° ____
Trace B

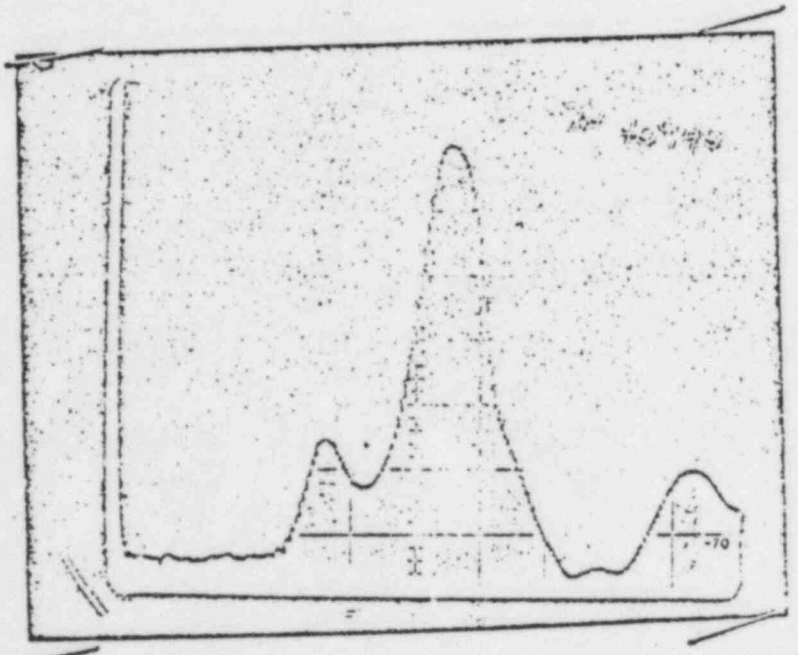
Remarks: 41.50 dB

FREQUENCY SPECTRUM ANALYSIS

Center Frequency 5.0 MHz
Dispersion 1.0 MHz/cm
Vertical Display Mode-Linear
Receiver 57A4823

Excitation pulse 10-N
Details/Remarks
(w) V-377SB

Serial No. 40940



TRANSMITTED SPECTRUM

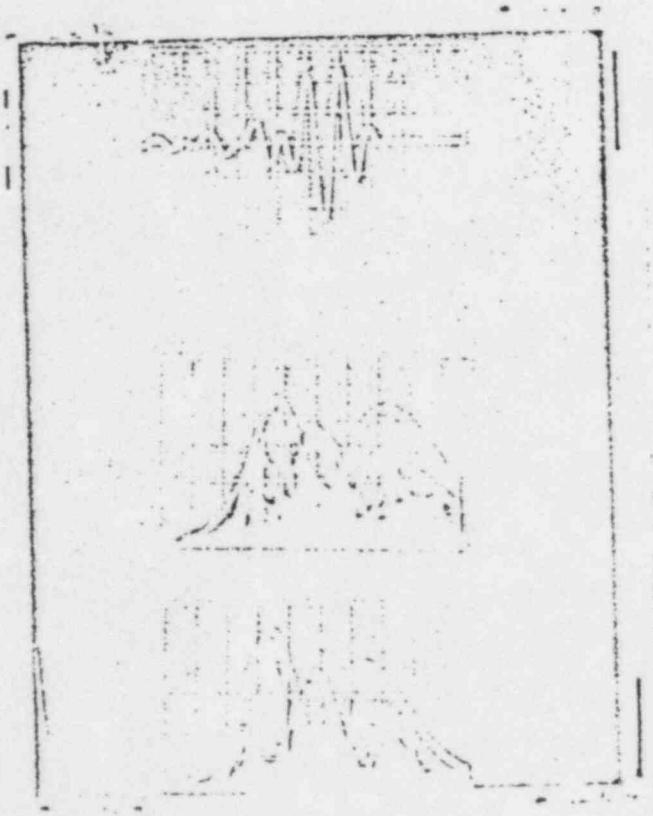
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1345 WITHERSPOON ST. (BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Automation Industries S/N 41311

MARKED FREQUENCY: 5.0 MHz SIZE: .750" dia.

DATA SUPPLIED BY: Automation Industries



RESULTS

Central Scale Frequency 5.0 MHz (1.0 MHz/Division)

Transducer Central Frequency 5.0 MHz

[XX] Acceptable

[ ] Unacceptable

Evaluation By

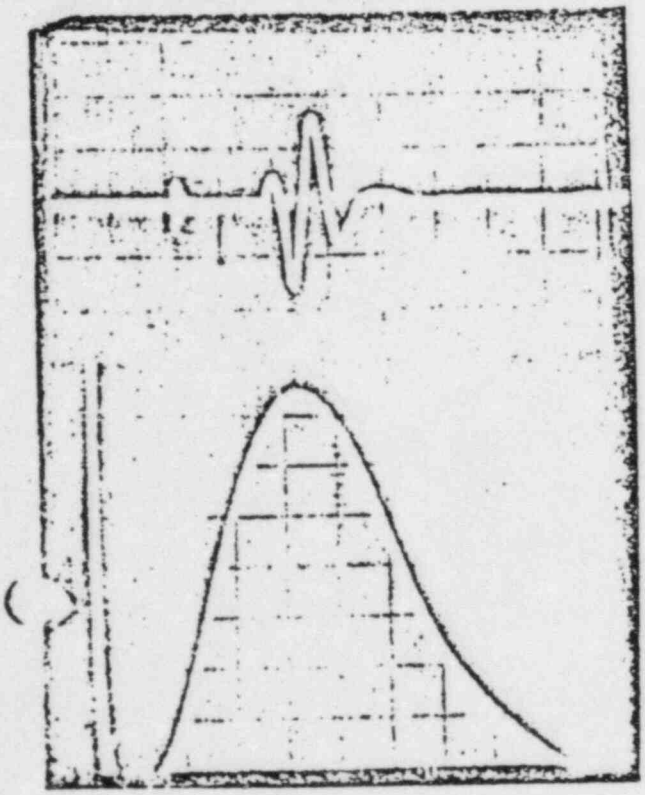
CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Panametrics S/N 3388

MARKED FREQUENCY: 2.25 MHz SIZE: 0.75" Dia.

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 2.5MHz (0.5 MHz/Division)

Transducer Central Frequency 2.2 MHz

[X] Acceptable

[ ] Unacceptable

Interpretation _____
D.B. M[illegible] II

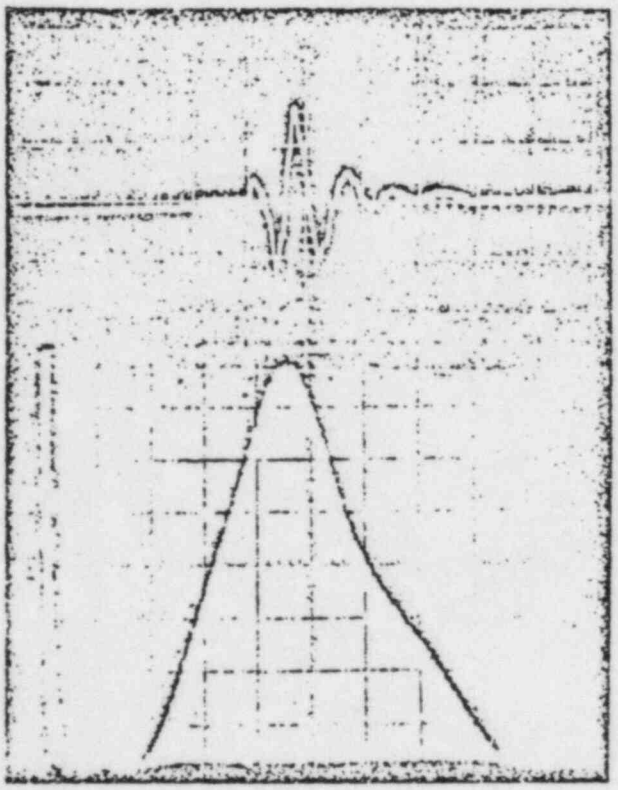
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 189
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Panametrics S/N 5775

MARKED FREQUENCY: 2.25 MHz SIZE: .75" diameter

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.25 MHz

[x] Acceptable

[ ] Unacceptable

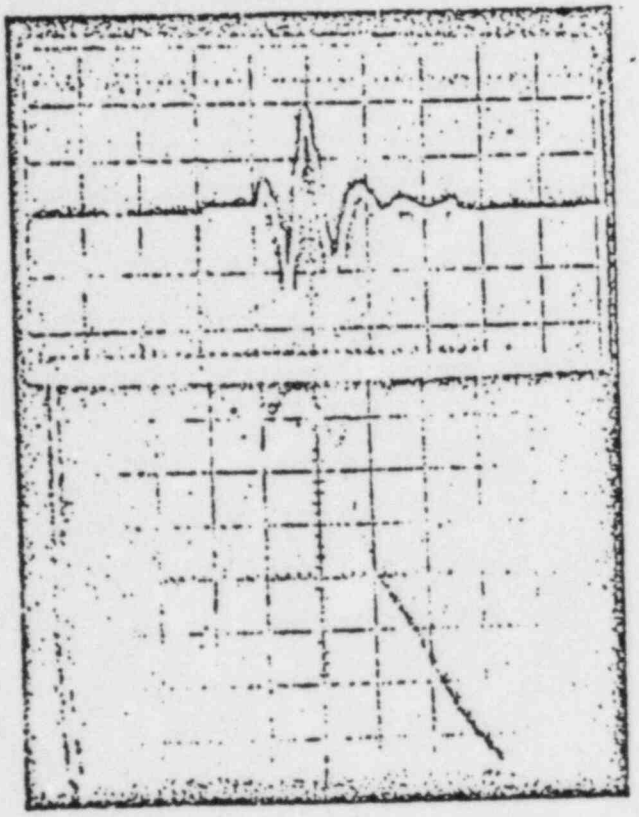
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
[redacted] WITHERSPOON ST / BOX 188
[redacted]HWAY, NEW JERSEY 07065 U.S.A.
(201) 581-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Panametrics S/N 6036

MARKED FREQUENCY: 2.25 MHz SIZE: .75" diameter

DATA SUPPLIED BY: Panametrics



2.5

RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.3 MHz

[x] Acceptable

[ ] Unacceptable

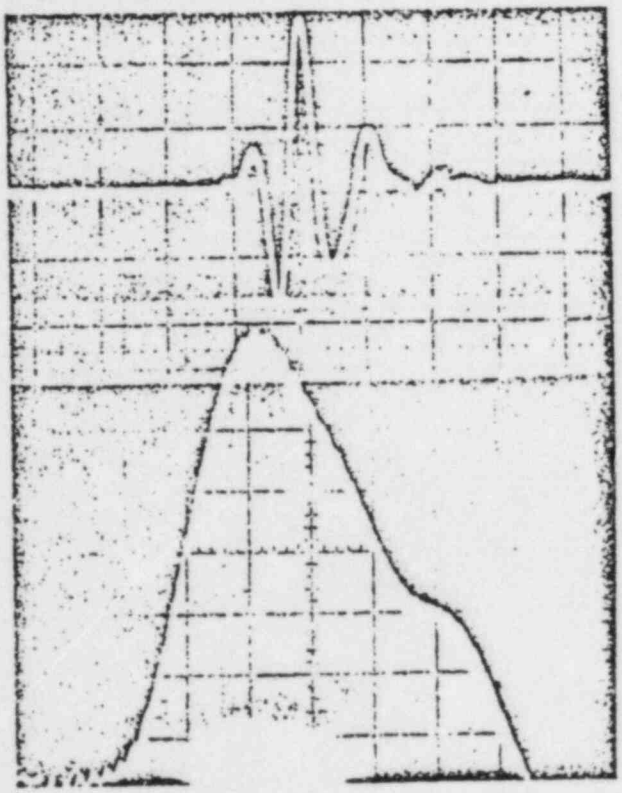
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST / BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Panametrics S/N 6201

MARKED FREQUENCY: 2.25 MHz SIZE: 1.0" diameter

DATA SUPPLIED BY: Panametrics



RESULTS

Contral Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.1 MHz

[x] Acceptable

[ ] Unacceptable

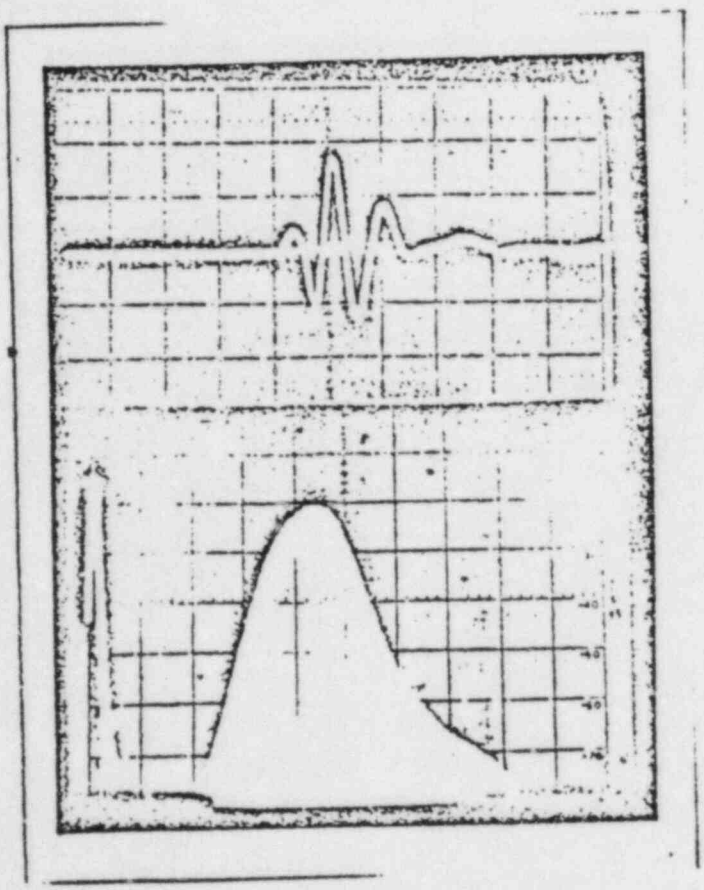
NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 168
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

FREQUENCY SPECTRUM ANALYSIS

MANUFACTURER: Panametrics S/N 6848

MARKED FREQUENCY: 2.25 MHz SIZE: .75" diameter

DATA SUPPLIED BY: Panametrics



RESULTS

Central Scale Frequency 2.5 MHz (0.5 MHz/Division)

Transducer Central Frequency 2.2 MHz

[x] Acceptable

[ ] Unacceptable

AUTOMATION INDUSTRIES, INC.
SPERRY DIVISION
DANBURY, CONNECTICUT 06810 U.S.A.

CERTIFICATE OF COMPLIANCE

TO: Conam Inspection Div.
Rahway, New Jersey

DATE May 16, 1975
P.O.# 99771
AUTOMATION ORDER# 6200-010

ITEM	QUANTITY	MODEL	DESCRIPTION	SERIAL
1	1	UJ	Reflectoscope	74638-4
2	1		Batt. Elim.	1115-3

This is to certify that the above instrument(s) meet(s) and/or exceed(s) manufactures applicable performance specifications and is in good working order.

Service Engineer J. Mark Schupach

AUTOMATION INDUSTRIES, INC.
SPERRY DIVISION
DANBURY, CONNECTICUT 06810 U.S.A.

CERTIFICATE OF COMPLIANCE

TO: Conam Inspection Div.
Rahway, New Jersey

DATE May 16, 1975
P.O.# 99772
AUTOMATION ORDER# 6200-010

ITEM	QUANTITY	MODEL	DESCRIPTION	SERIAL
1	1	UJ	Reflectoscope	7641-4

This is to certify that the above instrument(s) meet (s) and/or exceed (s) manufactures applicable performance specifications and is in good working order.

Service Engineer

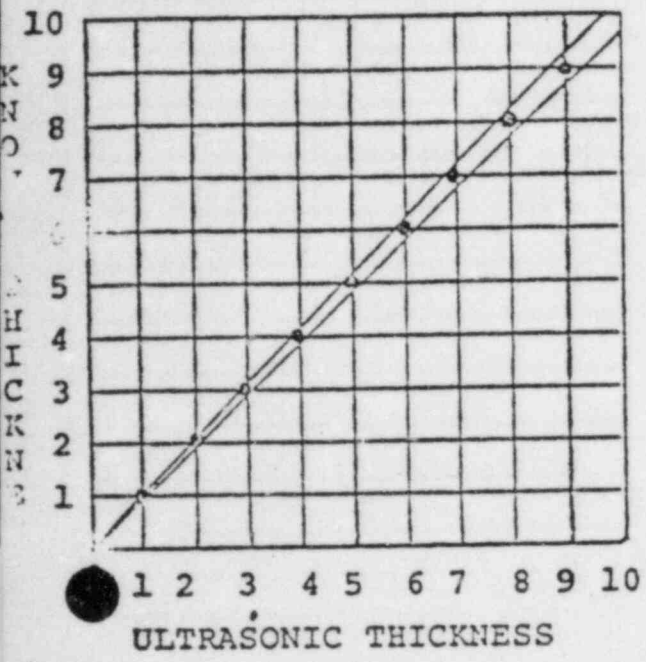
Ultrasonic Instrument

Model No. 5761000 Serial No. 85105-4

Calibration Block (describe) IIW 4340 STEEL

Transducer

Brand PANAMETRIC Frequency 2.25 Size .75 Straight Beam (✓) Angle Beam ( )



Horizontal Linearity Plot

Each back reflection is plotted on the graph indicating the actual thickness multiple (vertical) vs. the ultrasonic reflection multiple (horizontal). All ten (10) points must fall within the two (2) diagonal limit lines.

Vertical Linearity

SIGNAL AMPLITUDES (% FSH)

	Higher	Lower
(FSH)	100	50
(FSH)	80	40
3 (FSH)	61	30
4 (FSH)	50	25
5 (FSH)	40	20
6 (FSH)	30	15
7 (FSH)	21	10
8 (FSH)	10	5

The expected ratio of higher to lower signal amplitude is 2:1.

Amplitude Control Linearity

Initial Amplitude	dB Change	Result	Limit
80% FSH	Down 6	39	32%-48%
80% FSH	Down 12	20	16%-24%
40% FSH	Up 6	81	64%-96%
20% FSH	Up 12	90	64%-96%

This instrument is considered:

(✓) Acceptable

( ) Not Acceptable

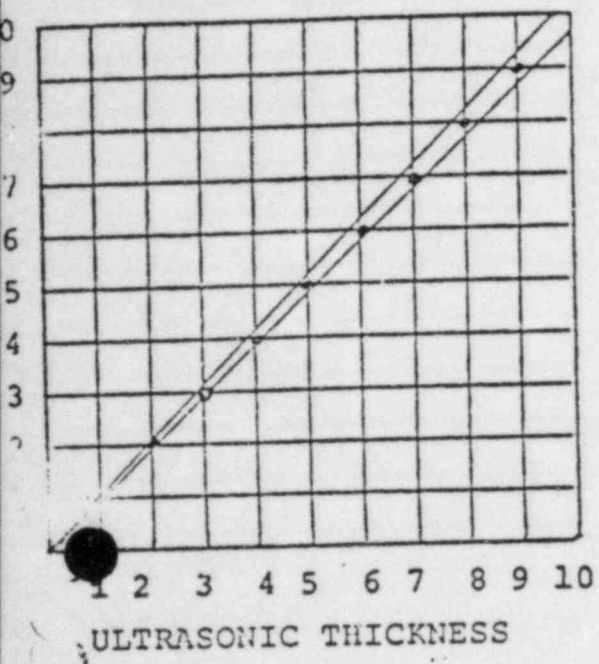
Signed Edward Anderson

Date 25th August 1975

ULTRASONIC INSTRUMENT LINEARITY RECORD

rasonic Instrument
el U.J. Serial No. ~~89579-5~~ 89559.5 Calibration Block (describe) IIW Block 4340 steel

nsducer
nd PANAMETRIC Frequency 2.25 Size 1" DIA Straight Beam (✓)
Angle Beam ( )



Horizontal Linearity Plot

Each back reflection is plotted on the graph indicating the actual thickness multiple (vertical) vs. the ultrasonic reflection multiple (horizontal). All ten (10) points must fall within the two (2) diagonal limit lines.

Vertical Linearity

	SIGNAL AMPLITUDES Higher	Lower
(FSH)	100	50
(FSH)	80	40
(FSH)	62	32
(FSH)	50	25
(FSH)	40	19
(FSH)	30	15
(FSH)	25	10
(FSH)	19	9

he expected ratio of
ig r to lower signal
mp ude is 2:1.

Amplitude Control Linearity

Initial Amplitude	dB Change	Result	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	75 %	64%-96%

This instrument is considered:

(✓) Acceptable

( ) Not Acceptable

Signed T. R. Lau

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

DATE	NSD-ISI-10	PAGE
May 1, 1973		1 of 2
	DATA SHEET	

INSTRUMENT: Mfr. Branson Instruments Model 301 S/N 8870

SEARCH UNIT Mfr. Automation Ind. Size 1.125" Ø Freq 2.25 MHz

HORIZONTAL LINEARITY:

Division	1	2	3	4	5	6	7	8	9	10
Position	0	1	2	3	4	5	6	7	8	9

VERTICAL LINEARITY:

B.R. 10	1	2	3	4	5	6	7	8	9	10
B.R. 9	1.2	2.4	3.5	4.8	6.0	7	8.2	9.2	SAT	SAT

CALIBRATED GAIN/ATTENUATOR

dB	2	4	6	8	10	12	14	16	18	20
AMP	4.9	4.9	4.9	4.9	4.9	4.9	4.9	5.0	5.0	5.0

dB	22	24	26	28	30	32	34	36	38	40
AMP	5.0	5.0	5.0	5.0	5.0	4.9	4.9	4.9	5.0	5.0

dB	42	44	46	48	50	52	54	56	58	60
AMP	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.9

dB	62	64	66	68	70	72	74	76	78	80
AMP	5.0									

PERFORMED BY: D.B. MacGill

D.B. MacGill

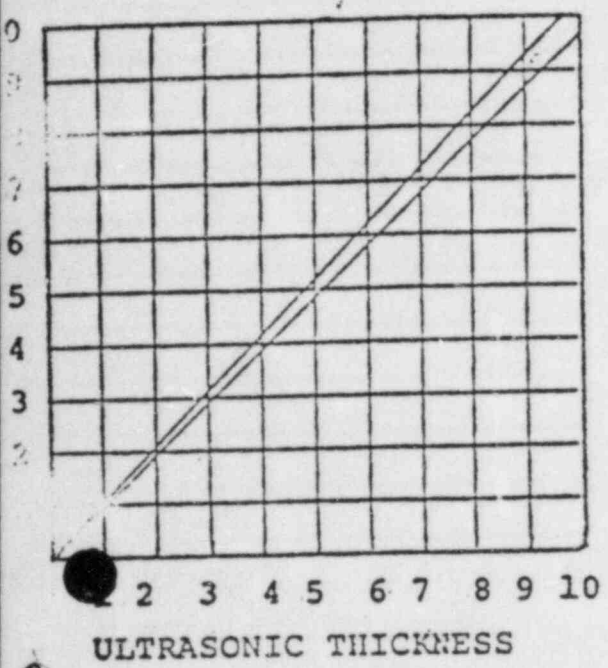
rasonic Instrument

l [redacted] Serial No. 10436

Calibration Bloc.. (describe) T1 [illegible]

cer

nd Panametrics Frequency 2.25 Size 3/4" Straight Beam (✓)
Angle Beam ( )



Horizontal Linearity Plot

Each back reflection is plotted on the graph indicating the actual thickness multiple (vertical) vs. the ultrasonic reflection multiple (horizontal). All ten (10) points must fall within the two (2) diagonal limit lines.

Vertical Linearity

← SIGNAL AMPLITUDES (% FSH)

Higher	Lower
[illegible] FSH)	[illegible]
[illegible] SH)	[illegible]
[illegible] (FSH)	[illegible]
[illegible] (FSH)	[illegible]
[illegible] (FSH)	[illegible]
[illegible] (FSH)	[illegible]
[illegible] (FSH)	[illegible]

[illegible] xpected ratio of [illegible] r to lower signal [illegible] ude is 2:1.

Amplitude Control Linearity

Initial Amplitude	dB Change	Result	Limit
80% FSH	Down 6	42	32%-48%
80% FSH	Down 12	20	16%-24%
40% FSH	Up 6	75	64%-96%
20% FSH	Up 12	52	64%-96%

This instrument is considered:

(✓) Acceptable

( ) Not Acceptable

Signed [illegible]

AUTOMATION INDUSTRIES, INC.
SPERRY DIVISION
DANBURY, CONNECTICUT 06810 U.S.A.

CERTIFICATE OF COMPLIANCE

TO: Conam Inspection Div.
NES, Inc.
Attn: F. T. Carr

DATE February 29, 1976
P.O.# N/A
AUTOMATION ORDER# N/A

ITEM	QUANTITY	MODEL	DESCRIPTION	SERIAL
1	1	854100-1	Nuclear Reflectoscope Maintenance and Calibration	001

Unit meets or exceeds all original equipment manufacturing specifications and meets linearity requirements specified in Conam Procedure No. PS-002.

Engineer Don Stout

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
(419) 874-7902

August 29, 1974

Mr. Lowell Prince
CONAN INSPECTION CO.
1385 Witherspoon Street
Rahway, New Jersey 07065

Re: TRIM REGULAR - your P. O. #2692

Dear Mr. Prince:

Your TRIM Representative, Morris Churgin of Mill Hardware & Tool Corp., Hempstead, Long Island, asked that I write you concerning the suitability of TRIM REGULAR for machining components for nuclear reactors.

You may consider this letter to be certification that TRIM REGULAR is free of sulfur, chlorine and other hologens and all heavy metals. It is our understanding that cutting fluids which are free of the above materials are acceptable under the applicable Atomic Energy Commission regulations.

We thank you for this opportunity to be of service.

Sincerely,

W. A. Sluhan

WAS/km

GULF COAST LABORATORY
Norco, Louisiana 70079
Tel. (504) 764-6933

LABORATORY SERVICE, INC.

ANALYTICAL, CONSULTING CHEMISTS

Independent Chemical Inspectors • Member A. S. T. M.

Telephone: Area Code 201 · 541-5151-2-3
TWX: 710-998-0482

LAFAYETTE STREET

CARTERET, N. J. 07008

Date June 13, 1975

Conam Industries, Inc.
P.O. Box 188
Rahway, N.J. 07065

Report No. 63 M

6/12/75

1 pint submitted sample

Oil
"Trim" Mfg. by Master Chem. Corp."

Bomb Sulfur, wt. %	*	(ASTM D-129)	0.065%
Halogen Content wt. %	*	(ASTM D-808)	less 0.001%

Note: Testing done by ASTM Method excepting special procedure modifications supplied by Conam Industries, Inc.

* Fussion of residue to weighing dish when fired in bomb.

gm

John H. Conley Jr

312-UN 7-8000
TELEX 25-4104

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. 5948

(1) Meet(s) the requirements of MIL-I-25135C and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
- (a) NAVSHIPS 250-1500-1 Paragraph 12.5.1.1
- (b) MIL-STD, 271D-NTR-1A
- (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix LX, Paragraph IX 3630
- (d) RDT Standard F3-6T, July, 1971, Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-NF, Formula B. Batch No. 3J055
Residue .0017 g/100ml. (See notes 2 and 3.)
Spotcheck Penetrant type SKL-HF/SKL-S Formula B. Batch No. 3D033
Residual Sulfur 0.0159 %
Residual Halogen 0.0109 %
Spotcheck Developer type SKD-NF, Formula B. Batch No. 3J089
Residual Sulfur 0.0239 %
Residual Halogen 0.0329 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

9-27-73
Date

J. T. Schmidt
Chief Control Chemist

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the lable of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight and RDT requires that the residual amount of total sulfur or halogen shall not exceed 1/2% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-0000
TELEX 25-4194

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

I hereby certify that the material(s) furnished on your Order No. 9-404

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U. S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
   (b) MIL-STD-271D, NTR-1A, Paragraph 5.3
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components Appendix IX, Paragraph IX 3630
   (d) ASME Boiler & Pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630.
   (e) RDT Standard F3-6T, May 1974, Article 6, Paragraph T-630

The sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner Type SKC-NF, Formula B. Batch No. 5D081
Residue .0037 g/100ml. (See note 3.)

Spotcheck Penetrant Type SKL-HF/SKL-S, Formula B. Batch No. 5C057
Residual Sulfur 0.0149 %
Residual Halogen 0.0072 %

Spotcheck Developer Type SKD-NF, Formula B. Batch No. 5C065
Residual Sulfur 0.1172 %
Residual Halogen 0.0277 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

7-8-75
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to parts per million" multiply percent figure by ten thousand (10,000).

NOTE: 3. NAVSHIPS 250-1500-1, MIL-STD-271D, NTR-1A, and ASME Section V all require that material be subjected to ASTM D-1353 or a very similar procedure to evaporate off volatile solvents before analysis for sulfur and halogen. According to these specifications, only those residues higher than 0.005g./100ml shall be analyzed for sulfur and halogen. Lower residues shall be reported.

NOTE: 4. Appendix IX has been eliminated from current editions of the ASME Boiler Code, Section III. It has been superseded in this area by Section V.

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. M9319

(1) Meet(s) the requirements of MIL-I-25135C and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
   (d) RDT Standard F3-6T, July, 1971, Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-NF, Formula B. Batch No. 4F042
Residue .0004 g/100ml. (See notes 2 and 3.)

Spotcheck Penetrant type SKL-NF/SKL-S Formula B. Batch No. 4H023
Residual Sulfur 0.0270 %
Residual Halogen [illegible] %

Spotcheck Developer type SKD-NF, Formula B. Batch No. 4H057
Residual Sulfur 0.0215 %
Residual Halogen [illegible] %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

8-25-74
Date

by JS.

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the lable of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight and RDT requires that the residual amount of total sulfur or halogen shall not exceed 1/2% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8000
TELEX 25-4194

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO: COM AM INSPECTION
P O BOX 188
RAHWAY, NJ. 07065

ATTENTION: Q.C. DEPT.

We hereby certify that the material(s) furnished on your Order No. _____

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
   (d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
   (e) RDT Standard F3-6T July, 1971 Paragraph 4.5

The sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type _____ Batch No. _____
Residual Sulfur _____
Residual Halogen _____

Spotcheck Penetrant type SKL-HF Batch No. 4E120
Residual Sulfur 0.0178 %
Residual Halogen 0.0139 %

Spotcheck Developer type _____ Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

_____
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8001
TELEX 25-4124

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. M8917

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix LX, Paragraph LX 3630
   (d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
   (e) RDT Standard F3-6T July, 1971 Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S — Batch No. 40010
Residue 0.0009 g/100ml. (See notes 2 and 3.)
Spotcheck Penetrant type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %
Spotcheck Developer type SKD-S — Batch No. 4J054
Residual Sulfur 0.0560 %
Residual Halogen 0.0083 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

9-27-74
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8000
TELEX 25-4194

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. 9-331

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
   (d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
   (e) RDT Standard F3-6T July, 1971 Paragraph 4.5

sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and ens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S — Batch No. 5B021 ✓
Residue 0.0012 g/100ml. (See notes 2 and 3.)
Spotcheck Penetrant type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %
Batch No. 5B014 ✓
Spotcheck Developer type SKD-S
Residual Sulfur 0.0004 %
Residual Halogen 0.0119 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

4-3-75
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

MAGNAFLUX CORPORATION

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. 2541

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:

(a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
(b) MIL-STD, 271D-NTR-1A
(c) ASME Boiler and Pressure Vessel Code, Section III., Nuclear Vessels, Appendix IX, Paragraph IX 3630
(d) ASME Boiler & pressure Vessel Code, Section V, No Destructive Examination, Paragraph T-630
(e) RDT Standard F3-6T July, 1971 Paragraph 4.5

The sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S Batch No. 4263
Residue .0014 g/100ml. (See notes 2 and 3.)
Spotcheck Penetrant type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %
Spotcheck Developer type SKD-S Batch No. 4211
Residual Sulfur 0.0051 %
Residual Halogen 0.0024 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

12-27-74
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.07%/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. AMS requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 606

TO:

ATTENTION:

I hereby certify that the material(s) furnished on your Order No. 3929

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U. S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
   (b) MIL-STD-271D, NTR-1A, Paragraph 5.3
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, Appendix IX, Paragraph IX 3630
   (d) ASME Boiler & Pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
   (e) RDT Standard F3-6T July, 1971 Paragraph 4.5
   (f) RDT Standard F3-6T May, 1974, Article 6, Paragrap.. T-630

The sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner Type SKC-S Batch No. 5D977
Residue 0.0003 g/100ml. (See note 3)
Spotcheck Penetrant Type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____%
Residual Halogen _____%
Spotcheck Developer Type SKD-S Batch No. _____
Residual Sulfur _____%
Residual Halogen _____%

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

5-13-75
Date

NOTE: 1. Our batch number appears on the label of all spray containers and on the label of all other containers.

NOTE: 2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to parts per million" multiply percent figure by ten thousand (10,000).

NOTE: 3. NAVSHIPS 250-1500-1, MIL-STD-271D, NTR-1A, and ASME Section V all require that material be subjected to ASTM D-1353 or a very similar procedure to evaporate off volatile solvents before analysis for sulfur and halogen. According to these specifications, only those residues higher than 0.005g./100ml shall be analyzed for sulfur and halogen. Lower residues shall be reported.

NOTE: 4. Appendix IX has been eliminated from current editions of the ASME Boiler Code, Section III. It has been superseded in this area by Section V.

MAGNAFLUX
CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 6064

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. M91010

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
- (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
- (b) MIL-STD, 271D-NTR-1A
- (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
- (d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
- (e) RDT Standard F3-6T July, 1971 Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S — Batch No. 4J075
Residue .0012 g/100ml. (See notes 2 and 3.)

Spotcheck Penetrant type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %

Spotcheck Developer type SKD-S — Batch No. 4J054
Residual Sulfur 0.0360 %
Residual Halogen 0.0023 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

10-23-74
Date

by js.

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

a Subsidiary of
AUTOMATION INDUSTRIES, INC.

ISSUED / REVISED		PROC. NO. / REV. NO.
May 1975	Edward L. Anderson, Jr.	Resume

Employment Background

1974 - Present	Conam Inspection - Inservice Inspection, Rahway, New Jersey
1967 - 1974	U. S. Air Force, General NDE

Educational Background

United States Armed Forces Institute - G.E.D.
Air Force Shelter Management Course
Air Force OJT Supervisor Course
360 hours - Air Force N.D.T. Specialist Course, 1968
146 hours - Air Force N.D.T. Supervosors Course, 1974
240 hours - Defence Spectrometric Oil Analysis

Abstract of Experience

Actively employed in NDT since 1968. Has had extensive experience in non-destructive testing including: Radiographic, Ultrasonic, Eddy Current, Magnetic Particle and Visual and Dye Penetrant Testing Methods.

Certifications

SNT-TC-1A Level II - Liquid Penetrant, Ultrasonic, Visual

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

CVEP-PSIS
Appendix C

PERSONNEL CERTIFICATION SUMMARY

Pre-Service & In-Service Visual Examinations

Employee Edward L. Anderson Certification Card No. CBM 016

Division Nuclear Services Certification Level II

Certification Date January 8, 1975 Restrictions None

1. Background & Experience:

   7 years General NDE, USAF

2. On the job instruction:

   January 7 & 8, 1975 Safety Injection System, Millstone 2

3. Physical Examination Record:

   J - 1 Type, 12-74

4. Examiners statement regarding comprehension and demonstrated abilities:

   12 hr. On - the - Job Instruction: Supervised Visual Examination, Para. 2, above.

D.B. MacGill

Conam Inspection
Nuclear Services Division

March 1974

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT (NMP)/JAMES A. FITZPATRICK (JAF) NUCLEAR SITE

Eye Examination for certification to ASME Boiler and Pressure Vessel Code, Section III, Appendix IX and SNT-TC-1A.

NON-DESTRUCTIVE EXAMINATION PERSONNEL QUALIFICATION

NAME Edward L. Anderson, Jr. TEST METHOD _____

SOCIAL SECURITY # 094-38-4746 QUALIFICATION LEVEL _____

1. (Cover Left Eye) Right Eye O.D. Chart No. 20/25-
2. (Cover Right Eye) Left Eye O.S. Chart No. 20/25-1 WITHOUT
   Both Eyes O.V. Chart No. 20/25 CORRECTION

with glasses, if applicable. X

Type of glasses used _____ (example, reading, *bifocal)

*If bifocal, use lower set of lenses.

1. (Cover Left Eye) Right Eye O.D. Chart No. Read N 1
2. (Cover Right Eye) Left Eye O.S. Chart No. _____ O.U. 1
3. Both Eyes O.V. Chart No. _____

Color Vision: The following numbers were distinguished in the first 20 plates of the S. Irnihara Test for color blindness. 38 plates, 1971 edition. Also used Diagnostic color screening

Plate 1 89
Plate 2 5
Plate 3 3
Plate 4 74
Plate 5 26
Plate 6 56
Plate 7 42
Plate 8 27
Plate 9 6
Plate 10 52
Plate 11 _____
Plate 12 _____
Plate 13 1
Plate 14 1
Plate 15 1
Plate 16 _____
Plate 17 _____
Plate 18 1
Plate 19 _____
Plate 20 _____

I certify that Edward L. Anderson has been given the above eye tests and has met the requirements of reading the J-1 portion of the chart, and the applicant's color vision test answers are recorded above.

Signed _____ M.D. Title _____ Date 9/23/75

Note: This test complies with the American Society for nondestructive testing recommended practices no. SNT-TC-1A (1968 edition) supplements A, B, C & D.

VISION TEST

Jaeger J-1 or Equivalent

NAME Anderson, Elwood

DISTANT VISION		NEAR VISION	
Uncorrected RE	20/20	Uncorrected RE	20/20
LE	20/15	LE	20/20
Corrected RE		Corrected RE	
LE		LE	

COLOR VISION Excellent

REMARKS

Examiner Helen Lifstein R.N.

Date 28/Jan./1975

FORM E-1518

VISION TEST

Name [illegible]

Distant Vision		Near Vision	
Uncorrected RE	[illegible]	Uncorrected RE	J-2
LE	[illegible]	LE	J-1
Corrected RE		Corrected RE	
LE		LE	

Color Vision [illegible]

Remarks: Reads J-1 & both eyes together

Examiner [illegible] Date 3-21-75

PERFORMANCE TEST

This test conducted in accordance with the nondestructive test procedures M&P 2.4.2.1(a) and M&P 2.4.3.1(a) using a prepared sample containing known defects.

Magnetic Particle Test Block:

Satisfactory _____ Failure _____

Liquid Penetrant Test Block:

Satisfactory _____ Failure _____

Remarks: _____

Examiner _____ Date _____

May 1975	Edward L. Anderson, Jr.	PROC. NO. REV. NO.	Resume

Employment Background

1974 - Present	Conam Inspection - Inservice Inspection, Rahway, New Jersey
1967 - 1974	U. S. Air Force, General NDE

Educational Background

United States Armed Forces Institute - G.E.D.
Air Force Shelter Management Course
Air Force OJT Supervisor Course
360 hours - Air Force N.D.T. Specialist Course, 1968
146 hours - Air Force N.D.T. Supervosors Course, 1974
240 hours - Defence Spectrometric Oil Analysis

Abstract of Experience

Actively employed in NDT since 1968. Has had extensive experience in non-destructive testing including: Radiographic, Ultrasonic, Eddy Current, Magnetic Particle and Visual and Dye Penetrant Testing Methods.

Certifications

SNT-TC-1A Level II - Liquid Penetrant, Ultrasonic, Visual

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1305 WITHERSPOON ST./BOX 188 RAHWAY, NEW JERSEY 07065 U.S.A.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Edward L. Anderson, Jr. CARD NO. DBM016

METHOD Liquid Penetrant LEVEL II

DIVISION Nuclear Services DATE Dec. 20, 1974

Restrictions to Certification (if any) _____

1. Background & Experience Record:

-7 years General NDE, U.S.A.F.

2. Training Course Record:

360 hrs. NDE Classroom and on job training U.S.A.F., 1968
140 hrs. NDE Classroom and on job training U.S.A.F., 1974

3. Physical Examination Record:

J-1 Type 12/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	12/74	76	0.3	0.23		DBM
Specific	12/74	100	0.2	0.20		DBM
Practical	12/74	95	0.5	0.475		DBM
					0.905	
Practical	1/76	95	RECERTIFICATION			

F. T. CARR PT III
1/23/76

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

.l historical information supplied by me to compile this certification summary is true, and accurate to the best of my knowledge.

Employee _____

D. B. MacGill
Examiner

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Edward L. Anderson, Jr. CARD NO. DBM016

METHOD Ultrasonic LEVEL II

DIVISION Nuclear Services DATE Dec. 30, 1974

Restrictions to Certification (if any) _____

1. Background & Experience Record:

   7 years General NDE, U.S.A.F.

2. Training Course Record:

   360 hrs. NDE Classroom and on job training U.S.A.F., 1968
   140 hrs. NDE Classroom and on job training U.S.A.F., 1974

3. Physical Examination Record:

   J-1 Type 12/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	12/74	100	0.3	0.30		DBM
Specific	12/74	90	0.2	0.18		DBM
Practical	12/74	90	0.5	0.45		DBM
					0.93	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

D. B. MacGill
Examiner

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE BARNES, Rodney CARD NO. FTC-001

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE 7 May 1975

Restrictions to Certification (if any) contact only

1. Background & Experience Record:

   Thirteen (13) years Ut experience
   High School graduate

2. Training Course Record:

Newport News Shipbuilding & D.D.	UT training school	40 hours
Seatrain Shipbuilding Corp.	UT weld inspection	20 hours

3. Physical Examination Record:

   Jaeger-1 Type (with glasses) 5/7/75

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
GENERAL	5/75	80	0.3	240		FTC
SPECIFIC	5/75	90	0.2	.180		FTC
PRACTICAL	5/75	80	0.5	.400		FTC
					.82	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

Examiner

PHYSICAL EXAMINATION

PART I (FILLED IN BY COMPANY SUPERVISOR) Construction Engineering

OCCUPANT _____ LOCATION _____

Barnes Rodney _____ _____

LAST NAME FIRST NAME MIDDLE NAME DATE

ADDRESS _____

OCCUPATION _____ DEPT. _____ DEPT. HEAD _____

PREVIOUS EMPLOYMENT WITH SYSTEM COMPANY YES ☐ NO ☐ COMPANY _____ DATE _____

PREVIOUS PRE-EMPLOYMENT EXAMINATION YES ☐ NO ☐ COMPANY _____ DATE _____

REASON FOR THIS EXAMINATION _____

PART II HISTORY

HAVE YOU EVER HAD OR BEEN TREATED FOR ANY OF THE FOLLOWING?
GIVE DETAILS AND DATES BELOW IF IN THE AFFIRMATIVE.

	YES	NO
1. HEADACHES, DIZZY SPELLS, FAINTING SPELLS, FITS, CONVULSIONS, UNCONSCIOUSNESS, PARALYSIS, EPILEPSY, NERVOUS BREAKDOWN, OR ANY OTHER MENTAL DISORDER?		
2. EYE, EAR, OR SPEECH IMPAIRMENT?		
3. NOSE TROUBLE, HAY FEVER, NOSE BLEEDS, FREQUENT SORE THROATS, TONSILLITIS, SORE TONGUE, TROUBLE WITH SWALLOWING OR SINUS TROUBLE?		
4. SKIN DISEASES OR DISORDERS, HIVES, SHINGLES, ATHLETE'S FOOT, PSORIASIS, ECZEMA OR POISON IVY?		
5. COUGH, SHORTNESS OF BREATH, BRONCHITIS, ASTHMA, LUNG DISEASE, TUBERCULOSIS, PNEUMONIA, PLEURISY, OR EMPHYSEMA?		
6. HEART DISEASE, PAIN IN CHEST, ANGINA, RHEUMATIC FEVER, HEART MURMUR, OR HIGH BLOOD PRESSURE?		
7. BLOOD VESSEL DISEASE, HARDENING OF ARTERIES, OR VARICOSE VEINS?		
8. URINARY TROUBLES, ALBUMIN, SUGAR, PUS, OR BLOOD IN URINE, KIDNEY, BLADDER, OR PROSTATE DISEASE?		
9. INDIGESTION, STOMACH ULCER, COLITIS, DIARRHEA, RECTAL TROUBLE, HEMORRHOIDS, OR HERNIA?		
10. [illegible]CTES, JAUNDICE, CIRRHOSIS, GALL BLADDER, OR LIVER DISEASE?		
11. [illegible] TUMOR, ANEMIA, LEUKEMIA, OR THYROID DISEASE?		
12. [illegible] TROUBLE, ARTHRITIS, GOUT, OR JOINT DISEASE?		
13. HAVE YOU EVER HAD A SURGICAL OPERATION OR SURGERY ADVISED BUT NOT PERFORMED?		
14. [illegible]Y ACCIDENTS OR SERIOUS INJURIES?		

DETAILS OF 1-14 IF ANSWERED YES — INDICATE THE QUESTION NUMBER.

CATAMENIA: ONSET _____ REGULARITY _____ DISCOMFORT _____ LAST PERIOD _____ MISCARRIAGES _____

MILITARY SERVICE YES _____ NO _____ BRANCH _____ DATES _____

TYPE OF DISCHARGE _____ DRAFT CLASSIFICATION _____

IF MEDICAL, GIVE REASON _____

FAMILY HISTORY	LIVING	DECEASED	STATUS OF HEALTH OR CAUSE OF DEATH
FATHER			
MOTHER			
SISTERS			
BROTHERS			

DO ANY MEMBERS OF YOUR FAMILY HAVE ANY OF THE FOLLOWING: TUBERCULOSIS, DIABETES, HEART DISEASE, MENTAL DISORDER, CANCER, KIDNEY DISEASE, OR ASTHMA. YES _____ NO _____

IF YES, PLEASE GIVE DETAILS _____

SOCIAL HISTORY	NONE	SLIGHT	MODERATE	HEAVY
TOBACCO				
ALCOHOL				
SEDATIVES				

DO YOU USE ANY HABIT FORMING DRUGS? YES _____ NO _____

I CERTIFY THAT THE ABOVE INFORMATION SUPPLIED BY ME IS TRUE TO THE BEST OF MY KNOWLEDGE.

_____ _____

DATE SIGNATURE

NORMAL — O

ABNORMAL — X — GIVE DETAILS

PART III PHYSICAL EXAMINATION (TO BE FILLED IN BY PHYSICIAN)

DATE OF BIRTH _____ M S W D CHILDREN _____

AGE _____ WEIGHT _____ PULSE _____ TEMP _____

(CLOTHES INDOOR CLOTHES BUT WITHOUT SHOES)

SKIN

EYES: COLOR Brown PUPILS _____

FUNDI _____

EXTERNAL OCULAR MOVEMENTS _____

NYSTAGMUS _____

VISION:

DISTANT (SNELLEN)	R —	L 20/20
DISTANT CORRECTED	R 20/15	L 20/15
NEAR (JAEGER)	R 20/25	L 20/25
NEAR CORRECTED	R 20/15	L 20/15

COLOR VISION Ishihara correct

GROSS FIELDS _____

EARS:

HEARING (SPOKEN VOICE)

R /20 L /20

NECK

LYMPH NODE ENLARGEMENT

MOUTH

TEETH

THROAT

THYROID

CHEST

BREASTS

HEART

BLOOD PRESSURE

ABDOMEN:

LIVER _____ SPLEEN _____

HERNIA

GENITALIA (OMIT ON FEMALES)

BACK

RECTUM:

HEMORRHOIDS _____ PILONIDAL SINUS _____

EXTREMITIES:

PULSE _____

NEUROLOGICAL:

REFLEXES _____

ROMBERG _____

URINE:

PH _____ BLOOD _____

SP. GR. _____ ALBUMIN _____ SUGAR _____

BLOOD HEMOGLOBIN

_____ METHOD USED: _____

EMOTIONAL STABILITY

LIST ABNORMAL FINDINGS:

1.

2.

3.

4.

C M Chatterton M D

SIGNATURE OF PHYSICIAN

5/20/15

DATE

a Subsidiary of
AUTOMATION IN. STRIES, INC.

EVISED May 1975	RODNEY BARNES	PROC. NO. REV. NO. Resume

Employment Background

1975 - Present	Conam Inspection - Inservice Inspection, Rahway, New Jersey
1973 - 1975	Seatrain Shipbuilding, Brooklyn, New York
1962 - 1973	Newport News Shipbuilding & Drydock Company Newport News, Virginia
	Military Service during this period, 1964 & 1966

Educational Backround

High School Graduate
Newport News Shipbuilding - UT Training School- 42 Hours
Seatrain Shipbuilding Corp. - UT Weld Inspection School- 20 Hours

Abstract of Experience

Actively employed in NDT since 1962. Has had extensive experience in both Ultrasonic and Radiographic inspection of pipe welds, plus visual inspection both nuclear and non-nuclear.

Memberships

American Society of Non-Destructive Testing

Certifications

SNT-TC-1A Level II - Ultrasonics

Dr. Barry Meyer
Optometrist

NORTH COUNTRY OPTICAL CENTER INC.

P. O. Box 714
Grant City Shopping Plaza · Route 25A
Rocky Point, N. Y. 11778
516/744-6800

Robert Bott
Robert Bott

6/27/75

Distance 20/20 OD without Correction
20/20 OS

near 20/20 without correction using
Dajie test.

pseudo-Isochromatic plates for
color perception — Answers
Optical.

No color defects present.

Barry Meyer #0754

D May 1975 VISED Sept. 1975	Robert H. Bott	PROC. NO. REV. NO.	Resume

Employment Background

1966 - Present — Conam Inspection, Inservice Inspection
Rahway, New Jersey

Educational Background

High School Graduate
80 hours - Radiographic Training, Conam Inspection, 1965
20 hours - Radiographic Training, Conam Inspection, 1968
40 hours - Radiographic Training, Conam Inspection, 1969
40 hours - Ultrasonic Training, Conam Inspection, 1974
20 hours - Ultrasonic Training, Conam Inspection, 1975

Abstract of Experience

Has extensive experience in Non-Destructive Testing since 1966. Has experience in both Radiographic and Ultrasonic inspection.

Certifications

SNT-TC-1A Level II - Radiographic, Level II- Ultrasonic

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 188 RAHWAY, NEW JERSEY 07065 U.S.A.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Robert Bott CARD NO. FTC-007

METHOD Ultrasonic LEVEL II

DIVISION Nuclear ISI DATE 9/18/75

Restrictions to Certification (if any) Contact methods only

1. Background & Experience Record:
   UT Level I 4/5/74
   RT Level II Since April 1968
   Has performed PSI and ISI examinations in more than ten (10) Nuclear Power Plants
2. Training Course Record:
   High School Graduate
   40 hour Basic Ultrasonic School 12/74 - Conam, Chicago
   20 hours of Advanced Ultrasonics May-June 1975, Conam, Rahway
3. Physical Examination Record:

   See attached sheet for latest eye examination

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	7/25/75	75	0.3	22.5		FTC
Specific	9/29/75	95	0.2	19.0		FTC
Practical	9/17/75	90	0.5	45.0		FTC
					86.5	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

F. T. Carr
Examiner

Employment Background

1973 to Present	Conam Inspection, Inservice Inspection Rahway, New Jersey
1970 to 1972	Makens Fab. Co., NDT Inspector

Educational Background

High School Graduate
South Dakota State University - Business & General Science
80 hours Ultrasonic Training - Makens Fab. Co.
40 hours Visual School, Conam Inspection, 1973
40 hour Classroom Training, Conam, Roseville, 1973
5 month On-Job-Training, Conam, Roseville, 1973

Abstract of Experience

Has been actively enployed in Non-Destructive Testing since 1970. Has had experience in Visual, Ultrasonic, and Dye Penetrant Testing.

Certifications

SNT-TC-1A Level II - Visual, Ultrasonic, Liquid Penetrant

CONAM Inspection, Inc.

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Lowell V. Bowne Certification Card No. KFL - 4

Test Method UT Certification Level II

Division 4075 Roseville Certification Date March 2, 1973

Restrictions to Certification (if any) None

1. Background and Experience Record:

   Makens Fab Co 18 months as a UT Techn. Cert to AWS D-2.0 and D-1.0

2. Training Course Record:

   Makens Fab 80 hours in UT

3. Physical Examination Record:

   Eye Examination March 2, 1973
   J-1 Type, March 1, 1974
   DBM 10-74

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	3-2-73	92.5	30%	27.75	Pass	K. Long
Specific	3-2-73	95.0	20%	19.00	Pass	K. Long
Practical	3-2-73	85.00	50%	42.50	Pass	K. Long
Composite				89.25		

5. Examiners comments:

CONAM Inspection, Inc
Certifying Agency

Kenneth I. Long
Examiners Signature

MY-III

PHYSICAL EXAMINATION

606-16 8-70

PART 1 (FILLED IN BY COMPANY SUPERVISOR)

(COMPANY)			LOCATION
Bowne	Lowell	V.	
LAST NAME	FIRST NAME	MIDDLE NAME	DATE

ADDRESS

OCCUPATION | DEPT. | DEPT. HEAD

PREVIOUS EMPLOYMENT WITH SYSTEM COMPANY YES ☐ NO ☐ COMPANY _____ DATE _____

PREVIOUS PRE-EMPLOYMENT EXAMINATION YES ☐ NO ☐ COMPANY _____ DATE _____

REASON FOR THIS EXAMINATION _____

PART II HISTORY

HAVE YOU EVER HAD OR BEEN TREATED FOR ANY OF THE FOLLOWING? GIVE DETAILS AND DATES BELOW IF IN THE AFFIRMATIVE.

	YES	NO
1. HEADACHES, DIZZY SPELLS, FAINTING SPELLS, FITS, CONVULSIONS, UNCONSCIOUSNESS, PARALYSIS, EPILEPSY, NERVOUS BREAKDOWN, OR ANY OTHER MENTAL DISORDER?		
2. EYE, EAR, OR SPEECH IMPAIRMENT?		
3. NOSE TROUBLE, HAY FEVER, NOSE BLEEDS, FREQUENT SORE THROATS, TONSILLITIS, SORE TONGUE, TROUBLE WITH SWALLOWING OR SINUS TROUBLE?		
4. SKIN DISEASES OR DISORDERS, HIVES, SHINGLES, ATHLETE'S FOOT, PSORIASIS, ECZEMA OR POISON IVY?		
5. COUGH, SHORTNESS OF BREATH, BRONCHITIS, ASTHMA, LUNG DISEASE, TUBERCULOSIS, PNEUMONIA, PLEURISY, OR EMPHYSEMA?		
6. HEART DISEASE, PAIN IN CHEST, ANGINA, RHEUMATIC FEVER, HEART MURMUR, OR HIGH BLOOD PRESSURE?		
7. BLOOD VESSEL DISEASE, HARDENING OF ARTERIES, OR VARICOSE VEINS?		
8. URINARY TROUBLES, ALBUMIN, SUGAR, PUS, OR BLOOD IN URINE, KIDNEY, BLADDER, OR PROSTATE DISEASE?		
9. INDIGESTION, STOMACH ULCER, COLITIS, DIARRHEA, RECTAL TROUBLE, HEMORRHOIDS, OR HERNIA?		
10. DIABETES, JAUNDICE, CIRRHOSIS, GALL BLADDER, OR LIVER DISEASE?		
11. CANCER, TUMOR, ANEMIA, LEUKEMIA, OR THYROID DISEASE?		
12. BACK TROUBLE, ARTHRITIS, GOUT, OR JOINT DISEASE?		
13. HAVE YOU EVER HAD A SURGICAL OPERATION OR SURGERY ADVISED BUT NOT PERFORMED?		
14. ANY ACCIDENTS OR SERIOUS INJURIES?		

DETAILS OF 1-14 IF ANSWERED YES — INDICATE THE QUESTION NUMBER

CATAMENIA: ONSET _____ REGULARITY _____ DISCOMFORT _____ LAST PERIOD _____ MISCARRIAGES _____

MILITARY SERVICE YES _____ NO _____ BRANCH _____ DATES _____

TYPE OF DISCHARGE _____ DRAFT CLASSIFICATION _____

IF MEDICAL, GIVE REASON _____

FAMILY HISTORY	LIVING	DECEASED	STATUS OF HEALTH OR CAUSE OF DEATH
FATHER			
MOTHER			
SISTERS			
BROTHERS			

DO ANY MEMBERS OF YOUR FAMILY HAVE ANY OF THE FOLLOWING: TUBERCULOSIS, DIABETES, HEART DISEASE, MENTAL DISORDER, CANCER, KIDNEY DISEASE, OR ASTHMA. YES _____ NO _____

IF YES, PLEASE GIVE DETAILS _____

SOCIAL HISTORY	NONE	SLIGHT	MODERATE	HEAVY
TOBACCO				
ALCOHOL				
SEDATIVES				

DO YOU USE ANY HABIT FORMING DRUGS? YES _____ NO _____

I CERTIFY THAT THE ABOVE INFORMATION SUPPLIED BY ME IS TRUE TO THE BEST OF MY KNOWLEDGE.

_____ _____

SIGNATURE

BROWNE LOWELL BOWIE

NORMAL – 0
ABNORMAL – X -- GIVE DETAILS

PART III PHYSICAL EXAMINATION (TO BE FILLED IN BY PHYSICIAN)

DATE OF BIRTH _____ M S W D CHILDREN _____

HEIGHT _____ WEIGHT _____ PULSE _____ TEMP _____
(BEING INDOOR CLOTHES BUT WITHOUT SHOES)

HEAD

SKIN

EYES: COLOR _____ PUPILS _____
FUNDI _____
EXTERNAL OCULAR MOVEMENTS _____
NYSTAGMUS _____

VISION:
DISTANT (SNELLEN) R — L —
DISTANT CORRECTED R 20/15 L 20/20
NEAR (JAEGER) R 20/10 L 20/10
NEAR CORRECTED R 20/10 L 20/10
COLOR VISION 14 – 14 correct
GROSS FIELDS _____

EARS:
HEARING. (SPOKEN VOICE)
R /20 L /20

NOSE

NECK

LYMPH NODE ENLARGEMENT

MOUTH

TEETH

THROAT

THYROID

CHEST

BREASTS

HEART

BLOOD PRESSURE

ABDOMEN:
LIVER _____ SPLEEN _____

HERNIA

GENITALIA (OMIT ON FEMALES)

BACK

RECTUM:
HEMORRHOIDS _____ PILONIDAL SINUS _____

EXTREMITIES:
PULSE _____

NEUROLOGICAL:
REFLEXES _____
ROMBERG _____

URINE:
PH _____ BLOOD _____
SP. GR. _____ ALBUMIN _____ SUGAR _____

BLOOD HEMOGLOBIN
_____ METHOD USED: _____

EMOTIONAL STABILITY

LIST ABNORMAL FINDINGS:

1. _____
2. _____
3. _____

[signature]
SIGNATURE OF PHYSICIAN

5/21/45
DATE

Resume of Dennis G. Burrelli

May 20, 1976

Employment Background

1971 to Present	NDT Technician - NES Division, Automation Ind., Danbury Connecticut
1970 to 1971	Sanitized Inc. - New Preston, Connecticut

Educational Background

High School Graduate	St. Marices School, Pittsburg PA

Abstract of Experience

Experienced in Laboratory and Field Inspection Techniques using various NDT methods. Current responsibilities include, set-up and inspection of materials in Laboratory and in Field.

Certifications

SNT-TC-1A - Level II - Liquid Penetrant
Level II - Ultrasonic

AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Dennis BURRELL CARD NO. _____

METHOD ULTRASONIC LEVEL II

DIVISION Sperry DATE April 1 1974

Restrictions to Certification (if any) _____

1. Background & Experience Record:

   3 years NDT
   Level 1 Ultrasonic Certification, April 1972

2. Training Course Record:
   40 Hour Ultrasonic School March 1972

3. Physical Examination Record:

   J-1 Type April 1974
   Oct 1. 1974

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	4/74	90	0.3	.270		LAJ
Specific	4/74	86	0.2	.172		LAJ
Practical	4/74	94	0.5	.470		LAJ
					0.912	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

L. A. Johnson
Examiner

FORM E-1518

VISION TEST

Name [illegible]

Distant Vision			Near Vision		
Uncorrected	RE	20/17	Uncorrected	RE	J-1
	LE	20/17		LE	J-1
Corrected	RE		Corrected	RE	
	LE			LE	

Color Vision [illegible]

Remarks:

Examiner [illegible] Date 5-25-77

PERFORMANCE TEST

This test conducted in accordance with the nondestructive test procedures M&P 2.4.2.1(a) and M&P 2.4.3.1(a) using a prepared sample containing known defects.

Magnetic Particle Test Block:

Satisfactory _____ Failure _____

Liquid Penetrant Test Block:

Satisfactory _____ Failure _____

Remarks:

Examiner _____ Date _____

HAROLD C. PATTERSON, M. D.
93 WEST STREET
DANBURY, CONNECTICUT
TEL. 748-2615

JAN 14 1975

January 10, 1975

Automation Industries
Shelter Rock Road
Danbury, Connecticut

Re: Dennis Burrelli
76 West Street
New Milford, Connecticut

To whom it may concern:

Mr. Burrelli was seen on December 16, 1974. He had no complaint relative to his eyes. The vision was 20/25 in each eye. Visual fields were normal. Intraocular tension was normal. The internal and external eyes were clear. Color vision was normal.

Very truly yours,

Harold C. Patterson, M. D.

HCP/gin

JONAM Inspection, Inc.

VISION TEST

Jaeger J-1 or Equivalent

NAME Dennis Bussell

	DISTANT VISION	NEAR VISION
Uncorrected RE	OD - 20/20	Jaeger
LE	OS - 20/20	Jaeger
Corrected RE	[illegible]	—
LE		

COLOR VISION Ishihara's Tests
Concise Edition

REMARKS

Examiner [signature]

Date 10/1/76

AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE John L. Cummins CARD NO. DCN - 017

METHOD Ultrasonic LEVEL I

DIVISION Nuclear Services DATE 3/6/75

Restrictions to Certification (if any) Contact Methods Only

1. Background & Experience Record:

   6 months experience as Trainee with Conam Inspection

2. Training Course Record:

   40 hour Ultrasonic School, December 16 - 20, 1974, Conam Inspection, Chicago, Ill.

3. Physical Examination Record:

   J-1 Type 3/3/75

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	12/74	91	0.3	.273		W.P.C.
Specific	3/75	85	0.2	.170		DBM
Practical	3/75	90	0.5	.450		DBM
					0.893	

5. EXAMINER'S COMMENTS:

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

D. B.
Examiner

AUTOMATION INDUSTRIES, INC.

DATE May 1975	John Cannizzo	PROC. NO. REV. NO. Resume

Employment Background

1974 to Present — Conam Inspection, Inservice Inspection
Rahway, New Jersey

Educational Background

High School Graduate
40 hours Ultrasonic School, Conam Inspection, December 16-20, 1974

Abstract of Experience

Has been actively in Non-Destructive Testing since 1974 and has experience in Ultrasonic Testing Methods.

Certification

SNT-TC-1A Level I - Ultrasonic

Attachment 8.0a
NDE-1.02
CN-ORIG.
March 1974

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT (NMP)/JAMES A. FITZPATRICK (JAF) NUCLEAR SITE

Eye Examination for certification to ASME Boiler and Pressure Vessel Code, Section III, Appendix IX and SNT-TC-1A.

NON-DESTRUCTIVE EXAMINATION PERSONNEL QUALIFICATION

NAME John Carrizzo TEST METHOD _____

SOCIAL SECURITY # 072-50-7295 QUALIFICATION LEVEL _____

1. (Cover Left Eye) Right Eye O.D. Chart No. A0 5' 20/20
2. (Cover Right Eye) Left Eye O.S. Chart No. Snellen projected 20/20-2
3. Both Eyes O.V. Chart No. _____ 20/20

Test with glasses, if applicable.

Type of glasses used NA (example, reading, *bifocal)

*If bifocal, use lower set of lenses.

1. (Cover Left Eye) Right Eye O.D. Chart No. 20/20 Rosenbaum pocket screener at 14"
2. (Cover Right Eye) Left Eye O.S. Chart No. 20/20
3. Both Eyes O.V. Chart No. 20/20

Color Vision: The following numbers were distinguished in the first 20 plates of the ~~S. Ishihara Test~~ for color blindness. 38 plates, 1971 edition. pseudoisochromatic plates passed

Plate 1 _____	Plate 6 _____	Plate 11 _____	Plate 16 _____
Plate 2 _____	Plate 7 _____	Plate 12 _____	Plate 17 _____
Plate 3 _____	Plate 8 _____	Plate 13 _____	Plate 18 _____
Plate 4 _____	Plate 9 _____	Plate 14 _____	Plate 19 _____
Plate 5 _____	Plate 10 _____	Plate 15 _____	Plate 20 _____

I certify that John Carrizzo has been given the above eye tests and has met the requirements of reading the J-1 portion of the chart, and the applicant's color vision test answers are recorded above.

Signed Barry R Bachler, MD Title Ophthalmologist Date FEB 24 1975

Note: This test complies with the American Society for nondestructive testing recommended practices no. SNT-TC-1A (1968 edition) supplements A, B, C & D.

Combustion Engineering, Inc. PHYSICAL EXAMINATION A B C D E F T P PE A T Sp.

Name CANNITO, FRANK (SR. DEV. ENGR. NUCLEAR LABS.) Age 28 Date Nov. 5 75

Wt. _____ Temp. _____ Gen'l Appearance u n o _____

Near Vision R 20 17 L 20 17 B 20 17 w Glasses R 20 15 L 20 17 B 20 15 Lateral Balance N Color Vision N

For Vision R 20 L 20 B 20 w Glasses R 20 L 20 B 20 Lateral Balance N Vertical Balance N Depth Perception N

Extremities

B.P. ___/___ Pulse _____

Skin & Lymph Nodes

Eyes

Nose

Ears

Mouth

Throat & Tonsils

Neck & Thyroid

Breasts

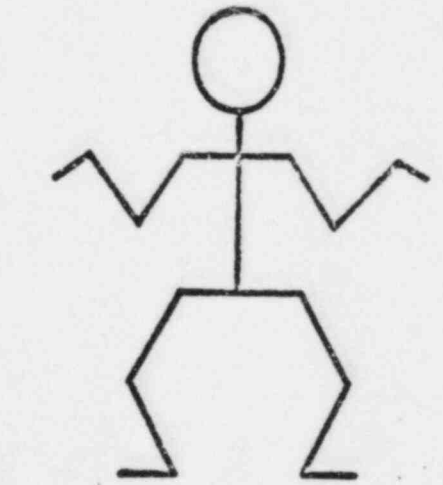
Lungs

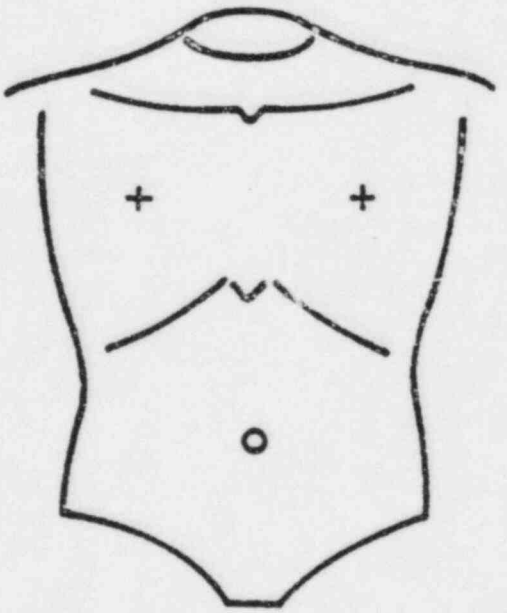
Abdomen

Spine & Back

Hernia & Genitals

Rectum & Prostate





Hgb	Hct	BSR	RBC	WBC	Diff
gm	%	mm/hr	M	T	N ___% L ___% M ___% B ___% E ___%

Urinalysis

S.G. _____ Protein _____ Glucose _____ Micro _____

Cholesterol mg% Uric Acid m

Moran R.N. M.D.

FRANK J. CANNITO, JR.

EDUCATION:

BS, Mechanical Engineering, The Cooper Union for the Advancement of Art and Science, 1968
MS, Mechanical Engineering, University of Connecticut, 1972
Additional Graduate Studies, University of Connecticut, 1973 to Present

PROFESSIONAL EXPERIENCE:

Combustion Engineering, Inc., 1976 to Present
Engineering Development and Services Department, Power Systems
Principal Development Engineer, Inservice Inspection, Systems Integrity Services

Mr. Cannito's current responsibilities relate to implementation of the requirements of the Inservice Inspection Code, Section XI of the ASME Boiler and Pressure Vessel Code in the development of preservice and inservice examinations for specific plants. His functions include preparation of procedures necessary for performing the required examinations, review of drawings to determine the impact of code requirements and performing related studies.

He has had considerable experience in the preparation and coordination of inspection programs at various sites, including the shop preservice examinations for General Public Utilities, Forked River, Unit No. 1. He has also served as Support Engineer for Northeast Utilities, Millstone Unit No. 2 and Louisiana Power and Light, Waterford III. His duties have also included A/E and customer interface coordination and indication evaluation.

Combustion Engineering, Inc., 1973 to 1975
Nuclear Laboratories, Nuclear Power Systems Division
Senior Development Engineer, Inservice Inspection

General Dynamics Corporation/Electric Boat Division, 1972 to 1973
Nuclear Construction Engineering
Deputy Program Manager

At Electric Boat, Mr. Cannito was Deputy Program Manager for a nuclear submarine undergoing overhaul at the shipyard. His duties included development of schedules and coordination of the repair work and testing efforts.

General Dynamics Corporation/Electric Boat Division, 1968 to 1972
Nuclear Construction Engineering
Senior Nuclear Project Engineer

As a senior nuclear project engineer, Mr. Cannito was responsible for preparation of modification and repair procedures for operational naval reactor plants in the area of mechanical components and piping systems. As a result of his experience in overhaul work, he has experience in the areas of health physics controls and radiation exposure limits.

ACHIEVEMENTS AND PROFESSIONAL AFFILIATIONS:

American Society of Mechanical Engineers

Pi Tau Sigma

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 168
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-3050

...amination for certification to ASME Boiler and Pressure Vessel Code, and SNT-TC-1A.

NON-DESTRUCTIVE EXAMINATION PERSONNEL QUALIFICATION

...ME Ralph Carpenter TEST METHOD(S) _____

QUALIFICATION LEVEL _____

		without glasses	
(Cover Left Eye)	Right Eye O.D.	Chart No. 20/25	Bausch & Lomb Acuity Projector
(Cover Right Eye)	Left Eye O.S.	Chart No. 20/25	
	Both Eyes O.V.	Chart No. 20/20	

...st with glasses, if applicable.

...of glasses used bifocals (example, reading, *bifocal)

...ifocal, use lower set of lenses. If glasses are required, so state.

...over Left Eye)	Right Eye O.D.	Chart No. 20/20	
(Cover Right Eye)	Left Eye O.S.	Chart No. 20/20	
	Both Eyes O.V.	Chart No. 20/20	

...olor Vision: The following numbers were distinguished in the first 20 plates of the S. Irhihara Test for color blindness. 38 plates, 1971 edition.
used 7th edition all perfect

...ate 1 ____	Plate 5 ____	Plate 9 ____	Plate 13 ____	Plate 17 ____
...ate 2 ____	Plate 6 ____	Plate 10 ____	Plate 14 ____	Plate 18 ____
...3 ____	Plate 7 ____	Plate 11 ____	Plate 15 ____	Plate 19 ____
...4 ____	Plate 8 ____	Plate 12 ____	Plate 16 ____	Plate 20 ____

...certify that Ralph Carpenter has been given the above ...e tests and has met the requirements of reading the J-1 portion of the chart, and ...he applicant's color vision test answers are recorded above.

...GNED _____ TITLE Optometrist DATE 12/10/75

...TE: This test complies with the American Society for nondestructive testing recommended practices no. SNT-TC-1A (1968 edition) supplements A, B, C & D.

Dr. E. A. Roure
40 Union St.
Rockville, Conn. 06066

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

Issued March 1976 Revised	RALPH CARPENTER	Proc. No. Rev. No. RESUME

Employment Background

March 1975 to Present	Conam Inspection Division - Inservice Inspection of Nuclear Power Plants utilizing both Manual and Automated Ultrasonic Examination Equipment.
Feb. 1965 - Jan. 1969	Pratt & Whitney Aircraft - Laboratory technician involved in Visual and Liquid Penetrant Examinations.

Educational Background

High School Graduate
40 hours - Basic Ultrasonics, Krautkramer-Branson
80 hours - Automated Ultrasonic Examination, Automation Industries
10 hours - Weld Inspection, Conam Inspection Division (Ultrasonics)
8 hours - Remote Television Inspection, Combustion Engineering
80 hours - Visual and Penetrant Inspection (On-Job-Training), Pratt & Whitney Aircraft

Certifications

SNT-TC-1A Level I - Ultrasonics

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1585 WITHERSPOON ST./BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

EMPLOYEE RALPH CARPENTER CARD NO. FTC-018

METHOD Ultrasonic LEVEL I

DIVISION Nuclear (ISI) DATE 12-9-75

RESTRICTIONS TO CERTIFICATION (IF ANY) Must wear eye glasses

1. Background and Experience:

Worked as a helper since March 1975
Prior inspection experience, four (4) years with Pratt & Whitney Aircr
High School Graduate

2. Training Course Record:

40 hours Basic Ultrasonics, Krautkramer-Branson 9/75
60 hours Nuclear Reflectoscope School, Automation Industries 10/75
10 hours Weld Inspection, Conam Rahway 12/75

3. Physical Examination Record:

See attached sheet for the latest eye examination report

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
GENERAL	12/8/75	78	.30	23.4		FTC
SPECIFIC	12/8/75	80	.20	16.0		FTC
PRACTICAL	12/9/75	90	.50	45.0	84.4	FTC

5. Examiner's Comments:

F. T. Car
Level III Examiner UT

All historical information supplied by me to compile this certification is true, and accurate to the best of my knowledge.

Employee Ralph L Carpenter Date 12/9/75

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

RECERTIFICATION

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Michael Delaney CARD NO. FTC-003

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE 6/18/75

Restrictions to Certification (if any) None

1. Background & Experience Record:
   H.S. Graduate
   Fifteen (15) years experience at varied applications of UT, MT, & P
   Fifteen (15) years total ultrasonic experience, over three years in nuclear ISI.
2. Training Course Record:
   One semester (102 hrs.) UT inspection, Contra Costa College, San Pablo, California, 1962.
3. Physical Examination Record:

   Complete Eye Examination 5/28/75.

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	6/18/75	87%	0.3	.26		FTC
Specific	6/18/75	90%	0.2	.18		FTC
Practical	5/20/75	90%	0.5	.45		FTC
					89%	

5. EXAMINER'S COMMENTS:
   Practical demonstration performed via audit while performing examination of steam generator at Chattanooga, Tenn. 5/20/75

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

Examiner

FORM E-1518

Conam Inspection

VISION TEST

Name Michael H. L. Carey

Distant Vision		Near Vision	
Uncorrected RE	20/20	Uncorrected RE	J-1
LE	20/20	LE	J-1
Corrected RE		Corrected RE	
LE		LE	

Color Vision Can identify Ishihara colors

Remarks: _____

_____

_____

Examiner L. Kenny RN Date 5/28/75

PERFORMANCE TEST

This test conducted in accordance with the nondestructive test procedures M&P 2.4.2.1(a) and M&P 2.4.3.1(a) using a prepared sample containing known defects.

Magnetic Particle Test Block:

Satisfactory _____ Failure _____

Liquid Penetrant Test Block:

Satisfactory _____ Failure _____

Remarks: _____

_____

_____

Examiner _____ Date _____

AUTOMATION INDUSTRIES, INC.

ISSUED January, 1973	MICHAEL H. DELANEY	PROC. NO. Resume
REV.		REV. NO.

Employment Background

1972 to Present	Conam Inspection, Three Mile Island Nuclear Power Station, Harrisburg, Pa. - Ultrasonic, Magnetic Particle, Liquid Penetrant, Visual Weld Inspector.
1968 - 1972	Testing Engineers - Ultrasonic, Magnetic Particle, Liquid Penetrant Inspector.
1963 - 1968	Automation Industries, Richmond, California - Ultrasonic, Magnetic Particle, Liquid Penetrant Inspector.
1959 - 1963	Ferro-Spec Labs, Los Angeles, California - Ultrasonic, Magnetic Particle, Liquid Penetrant Inspector; Physical Test Technician.

Educational Background

7 Weeks Ultrasonic Inspection, Contra Costa College
17 Weeks Magnetic Particle & Liquid Penetrant Inspection, Contra Costa College
Radiation Safety & Protection - Automation Industries
80 Hours Visual Weld Inspection, Conam Inspection

Abstract of Experience

Actively employed in NDT since 1959. Has had extensive experience in both in-lab and field applications of Ultrasonics, Magnetic Particle and Liquid Penetrants. Has applied inspection techniques to aero-space, aircraft, construction, petroleum, petrochemical, and nuclear industry requirements. Currently assigned to Pre Service/In Service Inspection Team, Conam Nuclear Services Division.

Currently holds SNT-TC-1A Level II certifications in Ultrasonics, Magnetic Particle, Liquid Penetrants, and Visual Weld Inspection.

a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

-RECERTIFICATION-

EMPLOYEE Michael H. DELANEY CARD NO. DBM-002

METHOD Ultrasonic LEVEL II

DIVISION Nuclear Services DATE March 1, 1975

Restrictions to Certification (if any) None

1. Background & Experience Record:
   16 years NDT

2. Training Course Record:
   1 Semester (17 weeks) Ultrasonic Inspection, Contra Costa College, San Pablo, Calif., 1962

3. Physical Examination Record:
   J-1 Type, 10/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner

5. EXAMINER'S COMMENTS:
   Recertification per Para. 7.1, CUTP-1 (Continued Satisfactory Performance)

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

D.B. MacGill
Examiner

a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Michael H. DELANEY CARD NO. DBM-002

METHOD Ultrasonic LEVEL II

DIVISION Nuclear Services DATE Feb. 1, 1972

Restrictions to Certification (if any) None

1. Background & Experience Record:

   13 years experience NDT-Ultrasonic, Magnetic Particle, Liquid Pentrant Inspection.
   Exceeds the requirements of Para. 5.4. b 2., CUPT-1

2. Training Course Record:

   1 Semester (102 hours) Ultrasonic Inspection, Contra Costa College, San Pablo, California , 1962.

3. Physical Examination Record:

   J-1 Type 2/72
   2/73
   3/74
   10/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner

5. EXAMINER'S COMMENTS:
   1. Original certification & Examinations from CONAM Richmond, Calif., lost in mail, Feb., 1972.
   2. Certified without examination per Para. 5.5.2.b 3., CUTP-1,("Certified by other agency meeting approval of examiner"). Previously certified b

CONAM INSPECTION, INC. Prime Aerospace Contractors
NUCLEAR SERVICES DIV. & Gov't Agencies.
Certifying Agency

D.B. MacGill
Examiner

PHYSICAL EXAMINATION

6&B 2+ 5-70

MY-HP 14

PART I (FILLED IN BY COMPANY SUPERVISOR)

(COMPANY) _____ LOCATION _____

LAST NAME _____ FIRST NAME _____ MIDDLE NAME _____ DATE _____

ADDRESS _____

OCCUPATION _____ DEPT. _____ DEPT. HEAD _____

PREVIOUS EMPLOYMENT WITH SYSTEM COMPANY YES ☐ NO ☐ COMPANY _____ DATE _____

PREVIOUS PRE-EMPLOYMENT EXAMINATION YES ☐ NO ☐ COMPANY _____ DATE _____

REASON FOR THIS EXAMINATION _____

PART II HISTORY

HAVE YOU EVER HAD OR BEEN TREATED FOR ANY OF THE FOLLOWING? GIVE DETAILS AND DATES BELOW IF IN THE AFFIRMATIVE.

	YES	NO
1. HEADACHES, DIZZY SPELLS, FAINTING SPELLS, FITS, CONVULSIONS, UNCONSCIOUSNESS, PARALYSIS, EPILEPSY, NERVOUS BREAKDOWN, OR ANY OTHER MENTAL DISORDER?		
2. EYE, EAR, OR SPEECH IMPAIRMENT?		
3. NOSE TROUBLE, HAY FEVER, NOSE BLEEDS, FREQUENT SORE THROATS, TONSILLITIS, SORE TONGUE, TROUBLE WITH SWALLOWING OR SINUS TROUBLE?		
4. SKIN DISEASES OR DISORDERS, HIVES, SHINGLES, ATHLETE'S FOOT, PSORIASIS, ECZEMA OR POISON IVY?		
5. COUGH, SHORTNESS OF BREATH, BRONCHITIS, ASTHMA, LUNG DISEASE, TUBERCULOSIS, PNEUMONIA, PLEURISY, OR EMPHYSEMA?		
6. HEART DISEASE, PAIN IN CHEST, ANGINA, RHEUMATIC FEVER, HEART MURMUR, OR HIGH BLOOD PRESSURE?		
7. BLOOD VESSEL DISEASE, HARDENING OF ARTERIES, OR VARICOSE VEINS?		
8. URINARY TROUBLES, ALBUMIN, SUGAR, PUS, OR BLOOD IN URINE, KIDNEY, BLADDER, OR PROSTATE DISEASE?		
9. INDIGESTION, STOMACH ULCER, COLITIS, DIARRHEA, RECTAL TROUBLE, HEMORRHOIDS, OR HERNIA?		
10. DIABETES, JAUNDICE, CIRRHOSIS, GALL BLADDER, OR LIVER DISEASE?		
11. CANCER, TUMOR, ANEMIA, LEUKEMIA, OR THYROID DISEASE?		
12. BACK TROUBLE, ARTHRITIS, GOUT, OR JOINT DISEASE?		
13. HAVE YOU EVER HAD A SURGICAL OPERATION OR SURGERY ADVISED BUT NOT PERFORMED?		
14. ANY ACCIDENTS OR SERIOUS INJURIES?		

DETAILS OF 1-14 IF ANSWERED YES – INDICATE THE QUESTION NUMBER.

_____

_____

_____

CATAMENIA: ONSET _____ REGULARITY _____ DISCOMFORT _____ LAST PERIOD _____ MISCARRIAGES _____

MILITARY SERVICE YES _____ NO _____ BRANCH _____ DATES _____

TYPE OF DISCHARGE _____ DRAFT CLASSIFICATION _____

IF MEDICAL, GIVE REASON _____

FAMILY HISTORY	LIVING	DECEASED	STATUS OF HEALTH OR CAUSE OF DEATH
FATHER			
MOTHER			
SISTERS			
BROTHERS			

DO ANY MEMBERS OF YOUR FAMILY HAVE ANY OF THE FOLLOWING: TUBERCULOSIS, DIABETES, HEART DISEASE, MENTAL DISORDER, CANCER, KIDNEY DISEASE, OR ASTHMA. YES _____ NO _____

IF YES, PLEASE GIVE DETAILS _____

SOCIAL HISTORY	NONE	SLIGHT	MODERATE	HEAVY
TOBACCO				
ALCOHOL				
SEDATIVES				

DO YOU USE ANY HABIT FORMING DRUGS? YES _____ NO _____

I CERTIFY THAT THE ABOVE INFORMATION SUPPLIED BY ME IS TRUE TO THE BEST OF MY KNOWLEDGE.

DEW

PART II PHYSICAL EXAMINATION (TO BE FILLED IN BY PHYSICIAN)

NORMAL — 0
ABNORMAL — X - GIVE DETAILS

DATE OF BIRTH _____ M S W D CHILDREN _____

HT _____ WEIGHT _____ PULSE _____ TEMP _____
(BEING IN DOOR CLOTHES BUT WITHOUT SHOES)

HEAD

SKIN

EYES: COLOR _____ PUPILS _____
FUNDI _____
EXTERNAL OCULAR MOVEMENTS _____
NYSTAGMUS _____

VISION
DISTANT (SNELLEN) R 20/40 L 20/25
DISTANT CORRECTED R 20/15 L 20/15
NEAR (JAEGER) R 20/10 L 20/10
NEAR CORRECTED R 20/10 L 20/10
COLOR VISION 14-14 Dvorine
GROSS FIELDS _____

EARS:
HEARING (SPOKEN VOICE)
R /20 L /20

NOSE

NECK

LYMPH NODE ENLARGEMENT

MOUTH

TEETH

THROAT

THYROID

CHEST

BREASTS

HEART

BLOOD PRESSURE

ABDOMEN
LIVER _____ SPLEEN _____

HERNIA

GENITALIA (OMIT ON FEMALES)

BACK

RECTUM:
HEMORRHOIDS _____ PILONIDAL SINUS _____

EXTREMITIES
PULSE _____

NEUROLOGICAL
REFLEXES _____
ROMBERG _____

URINE:
PH _____ BLOOD _____
SP GR. _____ ALBUMIN _____ SUGAR _____

BLOOD HEMOGLOBIN
_____ METHOD USED _____

EMOTIONAL STABILITY

LIST ABNORMAL FINDINGS:

1.

2.

3.

[signature] M.D.
SIGNATURE OF PHYSICIAN

5/2/75
DATE

CONAM INSPECTION, INC.
A Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE George Dow CARD NO. FTC-004

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE June 20, 1975

Restrictions to Certification (if any) Contact Examinations only

1. Background & Experience Record:
   High School Graduate
   Certified as Level I UT Technician 4/9/73
   Also certified Level II - MT,PT,VE and Level I - RT

2. Training Course Record:
   Forty (40) hr. training course in Ultrasonic inspection 2/73.
   Ten (10) hr training course in Advanced UT with Code Criteria 6/75.

3. Physical Examination Record:

   Complete eye exam 5/21/75

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	6/17/75	80	.3	24.0		FTC
Specific	6/19/75	78	.2	15.6		FTC
Practical	4/23/75	90	.5	45.0		FTC
					84.6	

5. EXAMINER'S COMMENTS: Practical demonstration performed via audit while performing examination of steam generator at Chattanooga, Tenn. 5/20/75

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

Frank T. Carr
Examiner

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

Issued May 1975 Revised Oct. 1975	Dew, George S.	Proc. No. Rev. No. RESUME

Employment Background

1962 to 1963	Consolidated American, Plattsburg, A.F.B.
1972 to Present	Conam Inspection, Inservice Inspection, Rahway, New Jersey

Educational Background

High School Graduate
Certified by U.S. Air Force in 1962 at Plattsburgh Air Force Base
Automation/Conam School of Nondestructive Testing
80 hours Visual Weld School, Conam, March, 1972
40 hours Ultrasonic School, Conam, April 1973
10 hours Ultrasonics, Conam, June 1975
80 hours Automated Ultrasonic Inspection School, NES, October 1975

Abstract of Experience

Actively employed in Nondestructive Testing since 1972. Has had experience in Magnetic Particle, Visual Weld, Liquid Penetrant, Ultrasonic, Radiographic Test Methods.

Certifications

UT Level I - 4/9/73
PT Level I - 1962, (USAF)
MT Level I - 1962, (USAF)
RT Level I - 2/12/73

UT Level II - 6/20/75
PT Level II - 2/15/72
MT Level II - 2/15/72
VT Level II - 4/1/72
Visual PSI/ISI - 9/24/75

[illegible], Inc.
a subsidiary of
[illegible]

CONAH INSPECTION, INC.
REPORT OF EYE EXAMINATION

NAME MARK EVENS DATE August 12, 1975

This is to certify that I have examined the above named individual on the date shown, and my findings are as follows:

	DISTANT VISION		NEAR VISION	
Uncorrected:	R. E.		Uncorrected: R.E.	
	L. E.		L.E.	
Corrected:	R. E. 20/20		Corrected: R.E. J-I	
	L. E. 20/20		L.E. J-I	

Color Vision: Normal

Remarks: Normal Vision

BY: Thelma Nichols

Note: Distant Vision should be recorded numerically, ad: 20/20
Near Vision should be recorded in terms of Jaeger Chart, ie: J-1, J-2, etc.
Color Vision should be recorded as normal or the degree and type of deficiency noted.

Kenneth F. Long
Kenneth F. [illegible]
Minnesota Division
Roseville, Minnesota

CONAM Inspection, Inc.

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Mark Evens Certification Card No. 4075-3

Test Method UT Certification Level II

Division 4075 Roseville Certification Date 3-2-73

Restrictions to Certification (if any): None

1. Background and Experience Record:
   Twin City Testing 1970 to 1973 Res Inspector Level I in UT, MT, and RT

2. Training Course Record:
   Twin City Testing NDT - 40 hours

3. Physical Examination Record:
   Eye Esamination - 3-2-73

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	2-28-73	90.0	30%	27.00	Pass	K. Long
Specific	2-28-73	97.5	20%	19.50	Pass	K. Long
Practical	3-1-73	83.00	50%	41.50	Pass	K. Long
Composite				88.00	Pass	

5. Examiners comments:

CONAM Inspection, Inc
Certifying Agency

Kenneth F Long
Examiners Signature

CONAM Inspection, Inc.

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Mark Evens Certification Card No. 4073-3

Test Method UT Certification Level II

Division 4073 Roseville Certification Date 3-2-73

Restrictions to Certification (if any): None

1. Background and Experience Record:
   Twin City Testing 1970 to 1973 Res Inspector Level I in UT, MT, and RT

2. Training Course Record:
   Twin City Testing NDT - 40 hours

3. Physical Examination Record:
   Eye Esamination - 3-2-73

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	2-28-73	90.0	30%	27.00	Pass	K. Long
Specific	2-28-73	97.5	20%	19.50	Pass	K. Long
Practical	3-1-73	83.00	50%	41.50	Pass	K. Long
Composite				88.00	Pass	

5. Examiners comments:

CONAM Inspection, Inc
Certifying Agency

Kenneth L. Long
Examiners Signature

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
[illegible]
RAMSEY, NEW JERSEY 07446 U.S.A.
[illegible]

ATTENTION:

Wayne Young/Glen Perkins

October 14, 1975

Mr. Glen Perkins
Combustion Engineering, Inc.
Prospect Hill Road
Windsor, Connecticut

Subject: Mr. Frank Freeman
Training

Dear Mr. Perkins:

This is to advise you of training provided to qualify Mr. Frank Freeman for certification as an Ultrasonic technician, Level I. Mr. Freeman has received training as listed below.

16 hours	ASNT Serinar - Ultrasonics ,1972
40 hours	On the Job Training and Self-Study
10 hours	Training by Conam Inspection, May-June, 1975

The above training is more than sufficient to comply with ASNT-TC-1A.

Sincerely,
Nuclear Energy Services, Inc.
Conam Inspection

F.T. Carr

Frank T. Carr
Ultrasonic Level III

FTC:jb

PART I (FILLED IN BY COMPANY SUPERVISOR)

COMPANY

LAST NAME | FIRST NAME | MIDDLE NAME | DATE

ADDRESS

OCCUPATION | DEPT | SUPERVISOR

PREVIOUS EMPLOYMENT WITH SYSTEM COMPANY YES ☐ NO ☐ COMPANY _____ DATE _____

PREVIOUS PRE-EMPLOYMENT EXAMINATION YES ☐ NO ☐ COMPANY _____ DATE _____

REASON FOR THIS EXAMINATION _____

PART II HISTORY

HAVE YOU EVER HAD OR BEEN TREATED FOR ANY OF THE FOLLOWING?
GIVE DETAILS AND DATES BELOW IF IN THE AFFIRMATIVE.

	YES	NO
1. HEADACHES, DIZZY SPELLS, FAINTING SPELLS, FITS, CONVULSIONS, UNCONSCIOUSNESS, PARALYSIS, EPILEPSY, NERVOUS BREAKDOWN, OR ANY OTHER MENTAL DISORDER?		
2. EYE, EAR, OR SPEECH IMPAIRMENT?		
3. NOSE TROUBLE, HAY FEVER, NOSE BLEEDS, FREQUENT SORE THROATS, TONSILITIS, SORE TONGUE, TROUBLE WITH SWALLOWING OR SINUS TROUBLE?		
4. SKIN DISEASES OR DISORDERS, HIVES, SHINGLES, ATHLETE'S FOOT, PSORIASIS, ECZEMA OR POISON IVY?		
5. COUGH, SHORTNESS OF BREATH, BRONCHITIS, ASTHMA, LUNG DISEASE, TUBERCULOSIS, PNEUMONIA, PLEURISY, OR EMPHYSEMA?		
6. HEART DISEASE, PAIN IN CHEST, ANGINA, RHEUMATIC FEVER, HEART MURMUR, OR HIGH BLOOD PRESSURE?		
7. BLOOD VESSEL DISEASE, HARDENING OF ARTERIES, OR VARICOSE VEINS?		
8. URINARY TROUBLES, ALBUMIN, SUGAR, PUS, OR BLOOD IN URINE, KIDNEY, BLADDER, OR PROSTATE DISEASE?		
9. INDIGESTION, STOMACH ULCER, COLITIS, DIARRHEA, RECTAL TROUBLE, HEMORRHOIDS, OR HERNIA?		
10. DIABETES, JAUNDICE, CIRRHOSIS, GALL BLADDER, OR LIVER DISEASE?		
11. CANCER, TUMOR, ANEMIA, LEUKEMIA, OR THYROID DISEASE?		
12. BACK TROUBLE, ARTHRITIS, GOUT, OR JOINT DISEASE?		
13. HAVE YOU EVER HAD A SURGICAL OPERATION OR SURGERY ADVISED BUT NOT PERFORMED?		
14. ANY ACCIDENTS OR SERIOUS INJURIES?		

DETAILS OF 1-14 IF ANSWERED YES — INDICATE THE QUESTION NUMBER.

CATAMENIA: ONSET _____ REGULARITY _____ DISCOMFORT _____ LAST PERIOD _____ MISCARRIAGES _____

MILITARY SERVICE YES _____ NO _____ BRANCH _____ DATES _____

TYPE OF DISCHARGE _____ DRAFT CLASSIFICATION _____

IF MEDICAL, GIVE REASON _____

FAMILY HISTORY

	LIVING	DECEASED	STATUS OF HEALTH OR CAUSE OF DEATH
FATHER			
MOTHER			
SISTERS			
BROTHERS			

DO ANY MEMBERS OF YOUR FAMILY HAVE ANY OF THE FOLLOWING: TUBERCULOSIS, DIABETES, HEART DISEASE, MENTAL DISORDER, CANCER, KIDNEY DISEASE, OR ASTHMA YES _____ NO _____

IF YES, PLEASE GIVE DETAILS _____

SOCIAL HISTORY

	NONE	SLIGHT	MODERATE	PLENTY
TOBACCO				
ALCOHOL				
SEDATIVES				

DO YOU USE ANY HABIT FORMING DRUGS? YES _____ NO _____

I CERTIFY THAT THE ABOVE INFORMATION SUPPLIED BY ME IS TRUE TO THE BEST OF MY KNOWLEDGE

FREEMAN

PART III PHYSICAL EXAMINATION (TO BE FILLED IN BY PHYSICIAN)

NORMAL — O
ABNORMAL — X — GIVE DETAILS

DATE OF BIRTH _____ M S W D CHILDREN _____

HEIGHT _____ WEIGHT _____ PULSE _____ TEMP _____
(WEARING INDOOR CLOTHES BUT WITHOUT SHOES)

HEAD

SKIN

EYES: COLOR _____ PUPILS _____
FUNDI _____
EXTERNAL OCULAR MOVEMENTS _____
NYSTAGMUS _____

VISION:
DISTANT (SNELLEN) R 20/20 L 20/15
DISTANT CORRECTED R L
NEAR (JAEGER) R 20/10 L 20/10
NEAR CORRECTED R L
COLOR VISION 11-14 correct.
GROSS FIELDS _____

EARS:
HEARING (SPOKEN VOICE)
R /20 L /20

NOSE

NECK

LYMPH NODE ENLARGEMENT

MOUTH

TEETH

THROAT

THYROID

CHEST

BREASTS

HEART

BLOOD PRESSURE

ABDOMEN:
LIVER _____ SPLEEN _____

HERNIA

GENITALIA (OMIT ON FEMALES)

BACK

RECTUM:
HEMORRHOIDS _____ PILONIDAL SINUS _____

EXTREMITIES:
PULSE _____

NEUROLOGICAL:
REFLEXES _____
ROMBERG _____

URINE:
PH _____ BLOOD _____
SP. GR. _____ ALBUMIN _____ SUGAR _____

BLOOD HEMOGLOBIN
_____ METHOD USED: _____

EMOTIONAL STABILITY

LIST ABNORMAL FINDINGS:

1. _____
2. _____
3. _____
4. _____

[signature]
SIGNATURE OF PHYSICIAN

7/1/[illegible]
DATE

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE FRANK E. FREEMAN CARD NO. FIC-005

METHOD ULTRASONIC LEVEL I

DIVISION NUCLEAR DATE 7/17/75

Restrictions to Certification (if any) Contact Only

1. Background & Experience Record:

   2 yrs. with Tuck-Free Elastomer-Canton, Ohio (Ultrasonic)
   5 yrs. as a Level II Radiographer

2. Training Course Record:
   High School Graduate
   16 Hr. Seminar
   On the job training

3. Physical Examination Record:

   Complete Eye Examination 5/21/75

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	7/17/75	74	.3	.22		FTC
Specific	7/17/75	75	.2	.15		FTC
Practical	5/75 6/75	90	.5	.45		FTC
					82%	

5. EXAMINER'S COMMENTS:

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

F. T. Carr
Examiner

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Frank E. Freeman CARD NO. _____

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE 5/23/74

Restrictions to Certification (if any) Contact testing only

1. Background & Experience Record:
   9½ years experience as a level II UT Technician
   1½ years college, Kent State

2. Training Course Record:
   10 week course in Babcock & Wilcox Welding School

3. Physical Examination Record:
   J1 11/22/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	5/23/74	90.0	.3	27.0		B.F. Creech
Specific	5/23/74	70.0	.2	14.0		B.F. Creech
Practical	5/23/74	80.0	.5	40.0	81.0	B.F. Creech

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

Transcribed and entered
G.T. Hamilton, General Mgr.

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Frank E. Freeman CARD NO. _____

METHOD Liquid Penetrant LEVEL II

DIVISION Nuclear DATE 5/24/74

Restrictions to Certification (if any) none

1. Background & Experience Record:
   14 years experience as a penetrant technician
   1½ years college at Kent State

2. Training Course Record:
   10 week course in Babcock & Wilcox Welding School
   No less than twelve (12) hours devoted to Penetrant Examination

3. Physical Examination Record:
   J1 11/22/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	5/24/74	88.9	.3	26.7		B.F. Creech
Specific	5/24/74	100	.2	20.0		B.F. Creech
Practical	5/24/74	80	.5	40.0	86.7	B.F. Creech

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

G T Hamilton
Transcribed and entered
G.T. Hamilton, General Manager

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

Issued August 1975 Revised	FRANK E. FREEMAN	Proc. No. Rev. No. RESUME

SNT-TC-1A
Level II - Radiography
Penetrant
Magnetic Particle
Level I - Ultrasonics

Employment Backround

3/75	Level I UT Level II, RT, MT, PT	Conam Nuclear ISI
5/74 - 3/75	Level II, RT, UT, PT, MT	Conam LaSalle Nuclear Station
4/72 - 5/74	Level II, RT, UT	Tuck-Free Elastomer - Canton, Ohio
10/64- 2/72	Level II, RT, PT, MT	Babcock and Wilcox - Copley, Ohio

Educational Backround

High School Graduate
4 years at Kent State University in Ohio; Civil Engineering Courses
40 week course in Babcock and Wilcox Welding School

Abstract of Experience

Started in B & W Power Generation Div. Erection Department operating various drill presses, boring machines, lathes, grinders and automatic presses. In May of 1967, was promoted to X-ray Technician in Non-destructive Testing Section utilizing radiographic, liquid penetrant and magnetic particle testing procedures to test welds. Was promoted in 1969 to Field Radiographer and supervised 1 to 15 technicians on various field assignments involving proper testing of welds according to code requirements. In 1971 was promoted to Radiograph Technician Specialist supervising 5 to 15 technicians on the proper testing of welds according to Code requirements.

Served as consultant to rubber and plastic firm with regard to compounding standards and ASME and ASTM Codes. Utilized radiography and ultrasonics for developing more adequate testing and production procedures.

Has performed various pre-service and in-service examinations of nuclear power plants since joining the Conam Nuclear Division.

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Frank E. Freeman CARD NO. _____

METHOD Liquid Penetrant LEVEL II

DIVISION Nuclear DATE 5/24/74

Restrictions to Certification (if any) none

1. Background & Experience Record:
   14 years experience as a penetrant technician
   1½ years college at Kent State

2. Training Course Record:
   10 week course in Babcock & Wilcox Welding School

3. Physical Examination Record:
   J1 11/22/74

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	5/24/74	88.9	.3	26.7		B.F. Creech
Specific	5/24/74	100	.2	20.0		B.F. Creech
Practical	5/24/74	80	.5	40.0	86.7	B.F. Creech

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

G T Hamilton
Transcribed and entered
G.T. Hamilton, General Mgr

HAROLD C. PATTERSON, M. D.
65 WEST STREET
DANBURY, CONNECTICUT
TEL. 748-2019

January 10, 1975

Automation Industries
Shelter Rock Road
Danbury, Connecticut

Re: Bruce Cavagan
3 Hawley Avenue
Danbury, Connecticut

To whom it may concern:

Mr. Cavagan was examined on December 16, 1974. He had a corrected vision of 20/25 in each eye. There was reported a spot being seen in his field of vision which showed up as a vitreous floater of no consequence. There was a change in his refractive error for which he was given a new lens prescription.

Both lenses showed minute posterior capsule deposits but these do not interfere with the vision. There is no contraindication for normal visual activity.

Very truly yours,

Harold C. Patterson, M. D.

HCP/gin

June 19, 1975

Nuclear Energy Services, Inc.
NES Division
Shelter Rock Road
Danbury, Connecticut

Re: Bruce Gavagan
Danbury, Connecticut

To whom it may concern:

As an addendum to the report of Mr. Bruce Gavagan's eye examination on January 10, 1975, Mr. Gavagan reads J-1 in each eye at near and has normal color vision in each eye using the H-R-R Pseudoisochromatic Eye Charts

Very truly yours,

Harold C. Patterson, M. D.

AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE ERROL GAVIGAN CARD NO. _____

METHOD Ultrasonic LEVEL I

DIVISION Sperry DATE 10-1-74

Restrictions to Certification (If any) None

1. Background & Experience Record:

   3 yrs. Electronics Tech.
   2 yrs. NDT Technician

2. Training Course Record:

   Ultrasonics 12/73 (40 hrs.)

3. Physical Examination Record:

   Opthalmic Examination 12/74 - H. Patterson, M.D.

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	9/74	92	0.3	.276		[illegible]
Specific	9/74	82	0.2	.164		[illegible]
Practical	9/74	95	0.5	.475		[illegible]
					.915	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of [illegible]

Automation Industries
Sperry Division

[illegible]

COMM INSPECTION, INC.
a subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE [illegible] CARD NO. LAJ 7000

METHOD ULTRASONIC LEVEL II

DIVISION Nuclear DATE 9-17-74

Restrictions to Certification (if any) _____

1. Background & Experience Record:

   3 years electronics tech
   3 years NDT

2. Training Course Record:

   40 hour Ultrasonic School, June, 1973

3. Physical Examination Record:

   J-1 Type Oct 7, 1974

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comb. Grade	Examiner
General	6/73	82	0.3	.246		LAJ
Specific	6/73	92	0.2	.184		LAJ
Practical	6/73	95	0.5	.475		LAJ
					0.905	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

COMM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

[signature]

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST. P.O. BOX 199
ROSELLE PARK, NEW JERSEY 07203 U.S.A.
(201) 301-0050

EMPLOYEE Thomas M. Jones Jr. CARD NO. ETC-021

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE January 22, 1976

RESTRICTIONS TO CERTIFICATION (IF ANY) none

1. Background and Experience:
   High School Graduate
   Level II - RT, MT, PT, Visual
   Has worked varied Ultrasonic assignments for some 25 months, which includes five (5) nuclear sites.

2. Training Course Record:
   Basic Ultrasonics, 40 hours at Conam, Minneapolis, 5/74
   Automated Ultrasonics, 80 hours at Automation, Danbury, 10/75

3. Physical Examination Record:
   See attached sheet for the latest eye examination report

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
GENERAL	9/15/75	87.5	.3	26.25		ETC
SPECIFIC	9/18/75	85	.2	17.00		ETC
PRACTICAL	1/21/76	85	.5	42.50	85.75	ETC

5. Examiner's Comments:

F. T. Carr
UT Level III Examiner
F. T. Carr

All historical information supplied by me to compile this certification is true, and accurate to the best of my knowledge.

Employee Thomas M. Jones Jr. Date 1/22/76

NUCLEAR ENERG SERVICES, INC.
CONAM INSPECTION DIVISION

ed Sept. 1975 evised	Thomas M. Jones, Jr.	Proc. No.. Rev. No. RESUME

mployment Background

..ay 1974 - June 1975	Conam Inspection - Minneapolis Involved with the NDT of castings, forgings, and welds using RT, UT, MT, and PT examination methods with heavy experience in UT and RT. Often worked nuclear ISI at the following sites: 9-mile Point, Surrey, Indian Point and Monticello.
June 1975 - Present	Conam - Nuclear Division Performed UT, PT, MT, and Visual examinations at several nuclear sites.

ducational Background

School Graduate

aining provided by Conam - Minneapolis (UT, MT, PT, RT)
..aining provided b, Conam - Nuclear (Visual)

Certifications

Ultrasonic II R
Visual II
Radiographic II
Penetrant II
Magnetic Particle II

ANTHONY R. BARRI, M. D.
EYE PHYSICIAN AND SURGEON
317 LONG HILL ROAD
GROTON, CONNECTICUT 06340

TELEPHONE 445-2461

July 23, 1975

To whom it may concern:

Re: Thomas M. Jones

The above has 20/20 vision in his right eye and 20/25 vision in his left eye without glasses; with glasses, 20/20 OD and 20/15 OS with vision at near 20/20 OU. (Jaeger 1) His color vision is normal.

Anthony Barri MD

Anthony R. Barri, M.D.

ARB:gg

CONAM Inspection, Inc.

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Tom Jones Certification Card No. KFLS

Test Method PT Certification Level II

Division Roseville Certification Date 7/1/74

Restrictions to Certification (if any): NONE

1. Background and Experience Record:

   Previous Employment Experience in all phases of NDT

2. Training Course Record:

   Classroom & Laboratory Training

3. Physical Examination Record:

   Annual Eye Examination

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	6/28/74	74	30	22		
Specific	6/28/74	100	20	20		
Practical	6/28/74	95	50	47		
				89	Pass	

5. Examiners comments:

CONAM INSPECTION, INC.
Certifying Agency

Examiners Signature

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST./BOX 168 RAHWAY, NEW JERSEY 07065 U.S.A.

PERSONNEL CERTIFICATION SUMMARY

Pre-Service & In-Service Visual Examinations

Employee Thomas M. Jones Certification Card No. FTC-009

Division Nuclear ISI Certification Level II

Certification Date 9/23/75 Restrictions None

1. Background & Experience:
   Level II - Penetrant 7/1/74
   Level II - Magnetic Particle 8/9/74
   40 hour Visual Inspection School 6/27/75, Three Mile Island
   8 hour Remote Television School 6/10/75, Combustion Engineering

2. On the job instruction:
   Nine Mile Point 9/23/75

3. Physical Examination Record:
   See attached sheet for the latest eye examination report

4. Examiners statement regarding comprehension and demonstrated abilities:
   See attached statement by E. Anderson, Level II

T. L. Lau
Conam Inspection
Nuclear Services Division

CONAM Inspection, Inc.

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee [redacted] Certification Card No. NTL 15

Test Method Visual Inspection Certification Level II

Division Roseville - 4073 Certification Date 7/15/74

Restrictions to Certification (if any): NONE

1. Background and Experience Record:

   Previous Employment Experience in all phases of NDT

2. Training Course Record:

   Classroom & Laboratory Training

3. Physical Examination Record:

   Annual Eye Examination

4. Technical Examination Record:
   No Written Examination Required if Technician is certified LEVEL II
   In Penetrant and Magnetic Particle, NT

Examination	Date	*Score	Weight	Score	Grade	Examiner

5. Examiners comments:

CONAM INSPECTION, INC.
Certifying Agency

Kenneth L. [illegible]
Examiners Signature

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Thomas M. Jones Jr. Certification Card No. NPL -5

Test Method UT Certification Level II

Division Roseville Certification Date 3-10-75

Restrictions to Certification (if any): Contact Method Only

1. Background and Experience Record:
   Previous Employment Experience in all phases of NDT
   Level II in MT, RT and PT Methods

2. Training Course Record:
   Classroom & Laboratory Training

3. Physical Examination Record:

   Annual Eye Examination

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	2-24-75	79	30	23.7	Pass	K. Long
Specific	2-24-75	88	20	17.6	Pass	K.Long
Practical	2-25-75	92	50	46	Pass	K. Long
			Total	87.3	Pass	K. Long

5. Examiners comments:

Certifying Agency [illegible] Examiners Signature [illegible]

COMAT INSPECTION, INC.

REPORT OF EYE EXAMINATION

NAME TOM JONES, JR. DATE 6/10/74

This is to certify that I have examined the above named individual on the date shown, and my findings are as follows:

	DISTANT VISION		NEAR VISION	
Uncorrected:	R. E. 20/20		Uncorrected:	R.E. 20/20
	L. E. 20/20			L.E. 20/20
Corrected:	R. E. No Glasses		Corrected:	R.E. No Glasses
	L. E. No Glasses			L.E. No Glasses

Color Vision: Normal

Remarks: No Glasses Needed

BY: Linda S. Ohlin
Linda S. Ohlin

Note: Distant Vision should be recorded numerically, ex: 20/20
Near Vision should be recorded in terms of Jaeger Chart, ex: J-1, J-2, etc.
Color Vision should be recorded as normal or the degree and type of deficiency noted.

Kenneth F. Lund - Manager
Minnesota Division
Roseville, Minnesota

Combustion Engineering, Inc. PHYSICAL EXAMINATION A B C D E F T P PE A T Sp.

Name Kirby, Richard Age 36 Date March 24 1975

Wt. _____ Temp. _____ Gen'l Appearance u n o _____

Near Vision	R 20	L 20	B 20	w Glasses	R 20/17	L 20/15	B 20/15	Lateral Balance	N	Color Vision	N
or Vision	R 20/17	L 20/17	B 20/15	w Glasses	R 20	L 20	B 20	Lateral Balance	N	Vertical Balance N	Depth Perception N

Extremities _____ B.P. ____/____ Pulse _____

Skin & Lymph Nodes _____

Eyes _____

Nose _____

Ears _____

Mouth _____

Throat & Tonsils _____

Neck & Thyroid _____

Breasts _____

_____

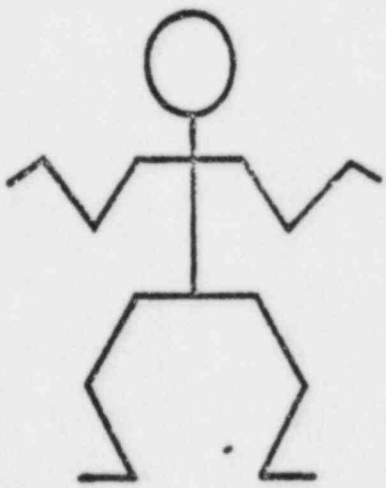
Lungs _____

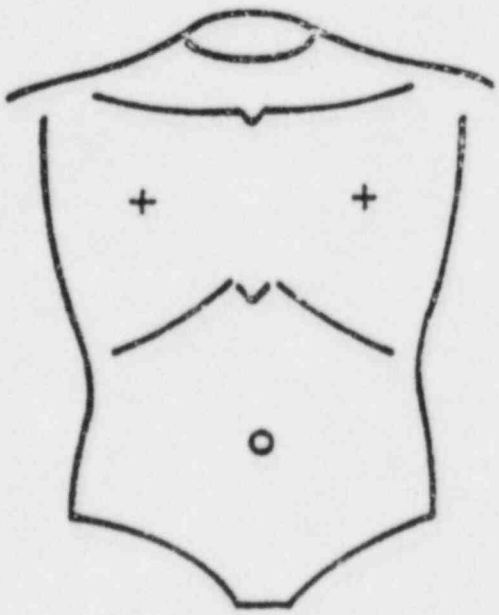
Abdomen _____

Spine & Back _____

Hernia & Genitals _____

Rectum & Prostate _____





Hgb gm	Hct %	ESR mm/hr	RBC M	WBC T	Diff N ___% L ___% M ___% ___% ___%

U yels

S.G. _____ Protein _____ Glucose _____ Micro _____

Cholesterol _____ mg% Uric Acid _____ mg%

M.D.

RICHARD P. KOSKY

EDUCATION:

BS, Mechanical Engineering, Worcester Polytechnic Institute, 1961

PROFESSIONAL EXPERIENCE:

Combustion Engineering, Inc., 1968 to Present
Nuclear Laboratories, Nuclear Power Department
Section Manager, Inservice Inspection, Systems Integrity Services

Mr. Kosky is Section Manager of the Inservice Inspection Group. In this capacity, he is responsible for all inservice inspection activities at Combustion Engineering. Responsibilities include developing inservice inspection programs that meet ASME, NRC and customer requirements. When a program has been sold, it is Mr. Kosky's responsibility to oversee the performance of that program. This requires close coordination between the customer, the architect engineer and NCD. All field inservice inspection activities are coordinated through his field inservice inspection engineering representatives.

Completed or currently active major commercial programs include:

- Field Preservice Examination of Millstone Point Unit 2.
- Shop and Field Preservice Examination of Arkansas Nuclear One, Unit 2
- Shop Preservice Examination of Louisiana Power and Light, Waterford Unit 3
- Shop Preservice Examination of General Public Utilities, Forked River, Unit 1
- Inservice Inspection for Maine Yankee Atomic Power Company

In addition to actual contract activities, Mr. Kosky determines R & D requirements and incorporates the results of these activities into customer programs.

Prior to assuming this position, Mr. Kosky was a Senior Development Engineer in the Nuclear Laboratories. He was responsible for development of CEA's and in-fuel buffers.

Hamilton Standard, Division of United Aircraft Corporation, 1961 to 1968
Senior Test Engineer

At United Aircraft, Mr. Kosky performed engineering development and testing of jet engine fuel controls. He was advisor for production manufacturing, assembly and test of jet engine auxiliary systems. Mr. Kosky was engineering consultant to the Quality Control Department and supervisor of engineering for the Overhaul and Repair Division of Hamilton Standard.

ACHIEVEMENTS AND PROFESSIONAL AFFILIATIONS:

Papers: "Inservice Inspection Program for a PWR," presented at the ANS Power Reactor Systems and Components Meeting, Williamsburg, Virginia, September 1 - 3, 1970.

"Remotely Actuated Television System," presented at the 19th Conference on Remote Systems Technology, Miami Beach, Florida, October 17 - 21, 1971.

Papers: "Nuclear Plant Monitoring Improves Reliability"- Appearing in Electrical World, May 15, 1974.

Patents: Visual and Ultrasonic Examiner for Reactors - U. S. Patent No. 3,664,922

U. S. Patent 3,764,736 Remotely Actuated Television System

To Whom It May Concern:

This is to certify that Richard P. Kosky has been qualified as a Level III for ultrasonic examination in accordance with the Nuclear Laboratories "Standard Operating Procedure for Certifying Ultrasonic Examination Personnel for Preservice/Inservice Examinations."

Certification is effective as of April 22, 1974, and was achieved without examination.

Certification is in accordance with the requirements of SNT-TC-1A.

Manager, Engineering
Development and Test

Date: April 22, 1974

NUCLEAR ENERGY SERVICES, INC.
CORPORATE INSPECTION DIVISION
[illegible]

Examination for certification to ASME Boiler and Pressure Vessel Code, and SNT-TC-1A.

NON-DESTRUCTIVE EXAMINATION PERSONNEL QUALIFICATION

[illegible] TEST METHOD(S) JR.

QUALIFICATION LEVEL

(Cover Left Eye) Right Eye O.D. Chart No. 20/20

(Cover Right Eye) Left Eye O.S. Chart No. 20/20

Both Eyes O.V. Chart No. 20/20

[illegible]th glasses, if applicable.

[illegible] of glasses used SINGLE VISION (example, reading, *bifocal)

*Bifocal, use lower set of lenses. If glasses are required, so state.

[illegible]ver Left Eye) Right Eye O.D. Chart No. 20/20

(Cover Right Eye) Left Eye O.S. Chart No. 20/20

Both Eyes O.V. Chart No. 20/20

[illegible]or Vision: The following numbers were distinguished in the first 20 plates of the S. Irhihara Test for color blindness. 38 plates, 1971 edition.

[illegible]e 1 YES	Plate 5 NO	Plate 9 [illegible]	Plate 13 [illegible]	Plate 17 [illegible]
[illegible]e 2 YES	Plate 6 [illegible]	Plate 10 [illegible]	Plate 14 [illegible]	Plate 18 [illegible]
[illegible]e 3 YES	Plate 7 [illegible]	Plate 11 [illegible]	Plate 15 [illegible]	Plate 19 [illegible]
[illegible]e 4 YES	Plate 8 YES	Plate 12 [illegible]	Plate 16 [illegible]	Plate 20 [illegible]

[illegible]ertify that [illegible] has been given the above [illegible]tests and has met the requirements of reading the J-1 portion of the chart, and applicant's color vision test answers are recorded above.

[illegible]ED [illegible] TITLE [illegible] DATE 12/4/[illegible]

[illegible]: This test complies with the American Society for nondestructive testing recommended [illegible]ctices no. SNT-TC-1A (1968 edition) supplements A, B, C & D.

CONAM Inspection

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Shelby Mcenach Certification Card No. FTC-011

Test Method Ultrasonic Certification Level I

Division Nuclear - ISI Certification Date 10/2/75

Restrictions to Certification (if any): must wear eye glasses

1. Background and Experience Record:
   Associate Degree in Electronics
   7 months ultrasonic testing with Pratt & Whitney

2. Training Course Record:
   18 hrs., "Introduction to NDT" - Thames Valley Technical College 1973
   18 hrs., "Ultrasonics" - Thames Valley Technical College 1973
   24 hrs., Ultrasonic ISI - Conam Inspection, September 1975

3. Physical Examination Record:

   See attached sheet for the latest eye examination report

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	7/28/75	94	.3	28.2		FTC
Specific	10/2/75	90	.2	18.0		FTC
Practical	10/1/75	90	.5	45.0		FTC
					91.2	FTC

5. Examiners comments:

Examiners Signature

All historical information supplied by me to compile this certification summary is true, and accurate to the best of my knowledge.

Employee

Date

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

Issued Dec. 1975 Revised	MEENACH, SHELBY	RESUME

Employment Background

July 1975 to Present	Conam Inspection, Inservice Inspection. Has worked both manual and automated Ultrasonic vessel examinations.
Sept. 1972 - Sept. 1974	Pratt & Whitney Aircraft, instrument service technician for repair and calibration of electronic equipment including Ultrasonic.

Educational Background

High School Graduate
1971 - Associate Degree, Thames Valley Technical College, Norwich, Conn.
72-1973 - NDT and Ultrasonic courses at Thames Valley (36 hrs. UT)
t. 1975 - 24 hours, Ultrasonic Weld Inspection, Conam, Rahway
. 1975 - 80 hours, Automated Ultrasonic Inspection, Automation Industries

Certifications

Level I - Ultrasonic since 10/2/75

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION
1385 WITHERSPOON ST / BOX 188
RAHWAY, NEW JERSEY 07065 U.S.A.
(201) 381-0050

ye Examination for certification to ASME Boiler and Pressure Vessel Code, and SNT-TC-1A.

NON-DESTRUCTIVE EXAMINATION PERSONNEL QUALIFICATION

ME SHELBY, MC MEEHACH JR. TEST METHOD(S) _____

QUALIFICATION LEVEL _____

1. (Cover Left Eye) Right Eye O.D. Chart No. 20/20-
2. (Cover Right Eye) Left Eye O.S. Chart No. 20/25-
3. Both Eyes O.V. Chart No. 20/20-

st with glasses, if applicable.

f glasses used SINGLE VISION (example, reading, *bifocal)

bifocal, use lower set of lenses. If glasses are required, so state.

1. (Cover Left Eye) Right Eye O.D. Chart No. 20/20-
2. (Cover Right Eye) Left Eye O.S. Chart No. 20/25-
3. Both Eyes O.V. Chart No. 20/20-

Color Vision: The following numbers were distinguished in the first 20 plates of the S. Irhihara Test for color blindness. 38 plates, 1971 edition.

Plate 1	YES	Plate 5	NO	Plate 9	NO	Plate 13	NO	Plate 17	NO
2	YES	Plate 6	NO	Plate 10	NO	Plate 14	NO	Plate 18	NO
3	YES	Plate 7	NO	Plate 11	NO	Plate 15	NO	Plate 19	NO
Plate 4	YES	Plate 8	YES	Plate 12	NO	Plate 16	NO	Plate 20	NO

I certify that MC. MEEHACH SHELBY JR has been given the above eye tests and has met the requirements of reading the J-1 portion of the chart, and the applicant's color vision test answers are recorded above.

SIGNED T Shelby MD TITLE OPTOMETRIST DATE 12-6-75

NOTE: This test complies with the American Society for nondestructive testing recommended practices no. SNT-TC-1A (1968 edition) supplements A, B, C & D.

I thought Mr. Shelby has failed this color test, I believe he would have no problems in distinguishing oscilloscope screen.

CONAM Inspection

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee Monroe, John Certification Card No. DF-1090

Test Method Ultrasonics Certification Level II

Division Columbus, Ohio Certification Date 1-6-75

Restrictions to Certification (if any): None

1. Background and Experience Record:

   See attached sheet.

2. Training Course Record:

   See attached sheet.

3. Physical Examination Record:

   See attached sheet.

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	1-75	92	.3		27.6	DF
Specific	1-75	87	.3		26.1	DF
Practical	1-75	95	.4		38.0	DF
					91.7	

5. Examiners comments: Certification granted by Conam Insp., Columbus, Ohio. Complies with SNT-TC-1A.

NUCLEAR ENERGY SERVICES, INC.
Conam Inspection Division

Certifying Agency

Dale T. Foster
Examiners Signature

Name Monroe, John R.

Birth Date

(Jaeger Type J-1 Letters)

Near Vision

Colorvision Optometrist

Distant Vision

Date	Uncorrect LE	Uncorrect RE	Correct LE	Correct RE	Uncorrect LE	Uncorrect RE	Correct LE	Correct RE		
7/24/74	20/40	20/40			J-1	J-1			Monroe	Dr. Mathews & Dr. Cauthen
Corr'd-To.	20/20	20/20			J/1	J/1				

Education, Name of School		Length, Date's Attended		Subj's. Studied
Grammer School	Lake Section-3 Rivers Mich.	1957	1966	General
High School	3 Rivers High School, Mich.	1966	1970	College Courses
College				
Tech. School				
Correspondence				

N.D.T. School and Courses	Date's	Subject
U. T. Conam, Houston, Texas training course	80 hrs. 10-23-72-11-10-72	

Experince, Training, Type	Date's		Level	
160 hrs. on job training, Houston Lab	10-23	11-10-72	I	Ultrasonics
Employed at Conam Houston Lab	10-23	6-25-74	II	Ultrasonic
Employed at Conam Columbus Lab	7-8-74	present	II	Ultrasonic

Certified To SNT-TC-1A, Type		Date's	Level
Conam Inspection-	Houston Texas lab Ultrasonics	11-10-72	I
Conam Inspection-	Houston Texas Lab Ultrasonics	11-21-73	II
Conam Inspection-	Columbus, Ohio Lab Ultrasonics	7-8-74	II
Conam Inspection-	Columbus, Ohio Lab Ultrasonic	1-6-75	II

NUCLEAR ENERGY SERVICES, INC.
CONAM INSPECTION DIVISION

Issued May 1975 Revised Oct. 1975	Munoz, Nelson A.	Proc. No. Rev. No. RESUME

Employment Background

May 1975 to Present	Conam Inspection, Inservice Inspection, Rahway, New Jersey
March 1975 to May 1975	D. Voehl Testing Corp., Woodside, New York
Feb. 1975 to March 1975	Peabody Testing, Chicago, Illinois
June 1972 to Jan. 1975	Seatrain Shipbuilding Corp., Brooklyn, New York

Educational Background

High School Graduate
60 hours - NDT training, Newark State College, December 1973
40 hours - Radiation Training, Seatrain Shipbuilding, Jan. 1974
40 hours - Ultrasonic Training, J.B. Engineering & Sales Co., January, 1975
40 hours - Ultrasonic Weld Inspection, Seatrain Shipbuilding, 1973

Abstract of Experience

Actively employed in Nondestructive Testing since 1972. Has had extensive experience in Ultrasonic inspection of pipe welds during Inservice Inspection.

Memberships

American Society for Nondestructive Testing

Certifications

SNT-TC-1A Level II Ultrasonic
Level I Penetrant

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Munoz, Nelson CARD NO. FTC-002

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE May 9, 1975

Restrictions to Certification (If any) Contact Only

1. Background & Experience Record:

   Three (3) years as ultrasonic technician.

2. Training Course Record:

   80 hours training at Seatrain Shipbuilding Corp.
   40 hours training at J.B. Engineering & Sales Co.
   120 hours training at Newark State College.

3. Physical Examination Record:

   J-1 Type 5/9/75

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	5/75	87.5	0.3	.26		FTC
Specific	5/75	80.0	0.2	.16		FTC
Practical	5/75	80.0	0.5	.40		FTC
					82	

5. EXAMINER'S COMMENTS:

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

T. P. Law
Examiner

FORM E-1518

VISION TEST

Name Mona Nelson

Distant Vision			Near Vision		
Uncorrected	RE	20/20	Uncorrected	RE	J-1
	LE	20/20		LE	J-1
Corrected	RE		Corrected	RE	
	LE			LE	

Color Vision 6

Remarks:

Examiner Floyd H. Elliott Date 5-25-10

PERFORMANCE TEST

This test conducted in accordance with the nondestructive test procedures M&P 2.4.2.1(a) and M&P 2.4.3.1(a) using a prepared sample containing known defects.

Magnetic Particle Test Block:

Satisfactory _____ Failure _____

Liquid Penetrant Test Block:

Satisfactory _____ Failure _____

Remarks:

Examiner _____ Date _____

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.

-PERSONNEL CERTIFICATION SUMMARY-

EMPLOYEE Randall L. Stanford CARD NO. FTC-008

METHOD Ultrasonic LEVEL II

DIVISION Nuclear DATE 9-26-75

Restrictions to Certification (if any) None

1. Background & Experience Record:
   UT - Level I 2/13/73
   Employed as an ultrasonic technician since 1/5/73, Conam, Houston
   PT - Level I

2. Training Course Record:
   80 hours - Basic Ultrasonics Feb. 1973 Conam, Houston
   40 hours - Ultrasonic Weld Inspection, Krautkramer-Branscn, Sept. 1975

3. Physical Examination Record:

   See attached sheet for latest eye examination

4. Technical Examination Record:

Examination	Date	% Score	Percentile Weight	Score	Comp. Grade	Examiner
General	9/15/75	82.5	.3	24.75		FTC
Specific	9/15/75	95.	.2	19.0		FTC
Practical	9/10/75	85.	.5	42.5		*
					86.5	FTC

5. EXAMINER'S COMMENTS:

   * Based on performance during steam generator examination

NOTE: Certification Procedure complies with requirements of SNT-TC-1A.

CONAM INSPECTION, INC.
NUCLEAR SERVICES DIV.
Certifying Agency

F. T. Carr

Examiner F. T. CARR

NUCLEAR ENERG. SERVICES, INC.
CONAM INSPECTION DIVISION

Issued Sept. 1975 Revised	Randall L. Stanford	Proc. No. Rev. No. RESUME

EMPLOYMENT BACKGROUND

January 1973 - June 1975 — Conam - Houston

Worked as an ultrasonic technician with the Conam - Houston laboratory in a variety of assignments including immersion applications. Performed ultrasonic examinations at Maine Yankee nuclear power station during this period.

June 1975 - Present — Conam - Nuclear ISI

Numerous assignments at nuclear examinations since joining our staff

EDUCATIONAL BACKGROUND

High School Graduate
80 hours training: Basic Ultrasonics at Conam - Houston
40 hours training: Ultrasonic Weld Inspection at Krautkramer- Branson

CERTIFICATIONS

Ultrasonics Level II - 1/6/75, Conam - Houston
Ultrasonics Level II - 9/26/75, Re-Certified, Conam-Nuclear ISI
Penetrant Level I - 5/9/75, Conam Houston

FORM E-1518

VISION TEST

Name Stewart D. Cantrell - Electronic Technician, work for Mr. Hobbs from Midland, Texas

Distant Vision		Near Vision	
Uncorrected RE	20/20	Uncorrected RE	J-1
LE	20/17	LE	J-1
Corrected RE		Corrected RE	
LE		LE	

Color Vision Passed satisfactorily

Remarks:

Examiner B. K. [illegible] E.N. Date 2-28-76

PERFORMANCE TEST

This test conducted in accordance with the nondestructive test procedures M&P 2.4.2.1(a) and M&P 2.4.3.1(a) using a prepared sample containing known defects.

Magnetic Particle Test Block:

Satisfactory _____ Failure _____

Liquid Penetrant Test Block:

Satisfactory _____ Failure _____

Remarks:

Examiner _____ Date _____

FEB 19 1975

DR. I. C. WICHMON
OPTOMETRIST
8640 BEECHNUT
HOUSTON, TEXAS 77035
TELEPHONE 771-1206

Conam Inspection Inc.
P. O. Box 36144
Houston, Texas 77036

Date 2/17/75

Name MR. RANDY STANFORD Age 26

External: NORMAL

Internal: NORMAL

Distant Acuity:

Unaided: Right 20/15 Left 20/15-1 Both 20/15

Present Rx: Right — Left — Both —

New Rx: Right — Left — Both —

Near Acuity:

Unaided: Jaeger 1.0 or better

Present Rx: Right 20/20 Left 20/20 Both 20/20

New Rx: Right — Left — Both —

Distant Phorias: Lateral Normal Vertical Normal

Near Phorias: Lateral Normal Vertical Normal

Color Tests: Normal

Fields of Vision: To Right 90° To Left 90° Both 180°

Biotronics Tonomotor Right Normal Left Normal

CONAM INSPECTION, INC.
a Subsidiary of
AUTOMATION INDUSTRIES, INC.
1995 W. COUNTY ROAD B-2
SUITE "A"
ROSEVILLE, MINN. 55113

CONAM INSPECTION, INC.
REPORT OF EYE EXAMINATION

NAME TOM YEAGER DATE August 12, 1975

This is to certify that I have examined the above named individual on the date shown, and my findings are as follows:

DISTANT VISION			NEAR VISION		
Uncorrected:	R. E.	20/20	Uncorrected:	R.E.	J-I
	L. E.	20/20		L.E.	J-I
Corrected:	R. E.	No Glasses	Corrected:	R.E.	No Glasses
	L. E.			L.E.	

Color Vision: Normal

Remarks: Normal Vision

BY: Thelma Nichols

Note: Distant Vision should be recorded numerically, ed: 20/20
Near Vision should be recorded in terms of Jaeger Chart, ie: J-1, J-2, etc.
Color Vision should be recorded as normal or the degree and type of deficiency noted.

Kenneth F. Long - Manager
Minnesota Division
Roseville, Minnesota

CONAM Inspection

PROCEDURE FOR CERTIFYING NONDESTRUCTIVE TEST PERSONNEL

PERSONNEL CERTIFICATION SUMMARY

Employee THOMAS YEAGER Certification Card No. KFL-9

Test Method UT Certification Level II

Division 4075 - Roseville Certification Date 8/26/75

Restrictions to Certification (if any): Contact Only

1. Background and Experience Record:

   18 Months X-Ray Engineering - Prairie Island, Minnesota

   1 Year Level I with Conam Inspection

2. Training Course Record:

   Aug. 1975 - 40 Hour Conam Ultrasonic Course

3. Physical Examination Record:

   - Annual Eye Examination

4. Technical Examination Record:

Examination	Date	%Score	Weight	Score	Grade	Examiner
General	8/22	98%	30%	29	Pass	W. Cotter
Specific	8/25	95%	20%	19	Pass	K. Long
Practical	8/25	97%	50%	48	Pass	K. Long
				96	Pass	K. Long

5. Examiners comments:

Conam Inspection
Certifying Agency

Examiners Signature

All historical information supplied by me to compile this certification summary is true, and accurate to the best of my knowledge.

Employee Thomas E. Yeager

Date 7-30-75

GULF COAST LABORATORY
Norco, Louisiana 70079
Tel. (504) 764-6933

LABORATORY SERVICE, INC.

ANALYTICAL, CONSULTING CHEMISTS

Independent Chemical Inspectors • Member A. S. T. M.

Telephone: Area Code 201 • 541-5151-2-3
TWX: 710-998-0482

LAFAYETTE STREET CARTERET, N. J. 07008

Date June 13, 1975

Conam Industries, Inc.
P.O. Box 183
Rahway, N.J. 07065

Report No. 63 M

6/12/75

1 pint submitted sample Batch No. 10184

Oil
"Trim" Mfg. by Master Chem. Corp."

Bomb Sulfur, wt. %	*	(ASTM D-129)	0.065%
Halogen Content wt. %	*	(ASTM D-808)	less 0.001%

Note: Testing done by ASTM Method excepting special procedure modifications supplied by Conam Industries, Inc.

*Fussion of residue to weighing dish when fired in bomb.

gm

John B. Conley, Jr.

MAGNAFLUX CORPORATION

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your [illegible]

(1) Meet(s) the requirements of MIL-I-25135C [illegible] the U. S. Air Force.

(2) Meet(s) the requirements of and have been tested [illegible] according to:

(a) NAVSHIPS 250-1500-1 (Rev. 6 June 1971) Paragraph 12.5.1.1

(b) MIL-STD-271D, NTR-1A, Paragraph 5.3

(c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power [illegible] Components, Appendix IX, Paragraph IX 3630

(d) ASME Boiler & Pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630

(e) NDT Standard F3-6T July, 1971 Paragraph 4.5

(f) NDT Standard F3-6T May, 1974, Article 6, Paragraph T-630

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner Type SKC-S Batch No. 5D477

Residue 0.0603 g/100ml. (See note 3)

Spotcheck Penetrant Type SKL-HF/SKL-S, Formula B. Batch No. _____

Residual Sulfur _____%

Residual Halogen _____%

Spotcheck Developer Type SKD-S Batch No. _____

Residual Sulfur _____%

Residual Halogen _____%

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

5-13-75
Date

J. T. Schmidt
Chief Control Chemist

NOTE: 1. Our batch number appears on all spray containers and on the label of all other containers.

NOTE: 2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to parts per million multiply percent figure by ten thousand (10,000).

NOTE: 3. NAVSHIPS 250-1500-1, MIL-STD-271D, NTR-1A, and ASME Section V will require that material be subjected to ASTM D-1353 or a very similar procedure to drive off volatile solvents before analysis for sulfur and halogen. Also, in these specifications, only those residues higher than 0.05g/100ml shall be analyzed for sulfur and halogen. Lower residues shall be reported.

NOTE: 4. Appendix IX has been eliminated from current editions of the ASME Boiler Code, Section III. It has been superseded in this area by Section V.

MAGNAFLUX
CORPORATION

ATTENTION:

We hereby certify that the material(s) furnished on [illegible] conforms to:

(1) Meet(s) the requirements of MIL-I-25135D (Amendment [illegible]), as specified by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:

(a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1

(b) MIL-STD, 271D-NTR-1A

(c) ASME Boiler and Pressure Vessel Code, Section [illegible], Nuclear Vessels Appendix IX, Paragraph IX 3630

(d) ASME Boiler & pressure Vessel code, Section [illegible], Nuclear Vessels Paragraph T-630

(e) NDT Standard PS-6T July, 1971 Paragraph 4.5

where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S Batch No. 4411

Residue .0014 g/100ml. (See notes 1 and 2.

Spotcheck Penetrant type SKL-HF/SKL-S, Formula II, Batch No. _____

Residual Sulfur _____ %

Residual Halogen _____ %

Spotcheck Developer type SKD-S Batch No. 4411

Residual Sulfur 0.0127 %

Residual Halogen 0.0024 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

[illegible]

1-11-74

[illegible]

Note: 1. Our batch number appears on the bottom of all [illegible] containers as well as on the label of all other containers.

Note: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1972 [illegible] tested by ASTM D-1353, and only those [illegible] shall be analyzed for sulfur and halogen.

Note: 3. ASME requires residual amount of sulfur or halogen [illegible] weight. Since the residue cannot be more than [illegible] the material meets the requirements if it is [illegible] the allowed limit.

[illegible] SYSTEMS METHODS • SERVICE

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. M8319

(1) Meet(s) the requirements of MIL-I-25135C and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of, and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
   (d) RDT Standard F3-6T, July, 1971, Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-NF, Formula B. Batch No. 4F042
Residue .0004 g/100ml. (See notes 2 and 3.)

Spotcheck Penetrant type SKL-NF/SKL-S Formula B. Batch No. 4H023
Residual Sulfur 0.0270 %
Residual Halogen 0.0223 %

Spotcheck Developer type SKD-NF, Formula B. Batch No. 4H083
Residual Sulfur 0.0215 %
Residual Halogen 0.0051 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

8-25-74
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the lable of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight and RDT requires that the residual amount of total sulfur or halogen shall not exceed 1/2% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8000
TELEX 25-4194

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE · CHICAGO, ILLINOIS 60656

TO: COMAM INSPECTION
P O BOX 188
RAHWAY, NJ. 07065

ATTENTION: Q.C. DEPT.

We hereby certify that the material(s) furnished on your Order No. _____

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
- (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
- (b) MIL-STD, 271D-NTR-1A
- (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
- (d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
- (e) RDT Standard F3-6T July, 1971 Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type _____ Batch No. _____
Residual Sulfur _____
Residual Halogen _____

Spotcheck Penetrant type SKL-HF Batch No. 4E120
Residual Sulfur 0.0178 %
Residual Halogen 0.0139 %

Spotcheck Developer type _____ Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

_____
Date

J. T. Schmidt
Chief Control Chemist

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8000
TELEX 25-4194

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. 9-331

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:

(a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1

(b) MIL-STD, 271D-NTR-1A

(c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630

(d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630

(e) RDT Standard F3-6T July, 1971 Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S Batch No. 5B021 ✓
Residue 0.0012 g/100ml. (See notes 2 and 3.)

Spotcheck Penetrant type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %

Spotcheck Developer type SKD-S Batch No. 5B014 ✓
Residual Sulfur 0.0004 %
Residual Halogen 0.0119 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

4-3-75
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

TELEX 25-419

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 6065

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. M91010

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
   (d) ASME Boiler & pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630
   (e) RDT Standard F3-6T July, 1971 Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-S — Batch No. 4J075
Residue .0022 g/100ml. (See notes 2 and 3.)

Spotcheck Penetrant type SKL-HF/SKL-S, Formula B. Batch No. _____
Residual Sulfur _____ %
Residual Halogen _____ %

Spotcheck Developer type SKD-S — Batch No. 4J054
Residual Sulfur 0.0560 %
Residual Halogen 0.0083 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

10-23-74
Date

by JS.

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8000
TELEX 25-4194

MAGNAFLUX CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. 5948

(1) Meet(s) the requirements of MIL-I-25135C and are approved by the U.S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
   (a) NAVSHIPS 250-1500-1 Paragraph 12.5.1.1
   (b) MIL-STD, 271D-NTR-1A
   (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels, Appendix IX, Paragraph IX 3630
   (d) RDT Standard F3-6T, July, 1971, Paragraph 4.5

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner type SKC-NF, Formula B. Batch No. 3J055
Residue .0017 g/100ml. (See notes 2 and 3.)
Spotcheck Penetrant type SKL-HF/SKL-S Formula B. Batch No. 3D033
Residual Sulfur 0.0159 %
Residual Halogen 0.0108 %
Spotcheck Developer type SKD-NF, Formula B. Batch No. 3J089
Residual Sulfur 0.0239 %
Residual Halogen 0.0329 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

9-27-73
Date

J. T. Schmidt
Chief Control Chemist

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the lable of all other containers.

NOTE: 2. NAVSHIPS 250-1500-1, Rev. 8 June, 1971 states that removers shall be tested by ASTM D-1353, and only those residues higher than 0.005g/100ml shall be analyzed for sulfur and halogen.

NOTE: 3. ASME requires residual amount of sulfur or halogen not to exceed 1% by weight and RDT requires that the residual amount of total sulfur or halogen shall not exceed 1/2% by weight. Since the residue cannot be more than 100% sulfur or halogen, the material meets the requirements if the total residue is less than the allowed limit.

312-UN 7-8000
TELEX 25-4194

[redacted]AFLUX
CORPORATION

7300 WEST LAWRENCE AVENUE • CHICAGO, ILLINOIS 60656

TO:

ATTENTION:

We hereby certify that the material(s) furnished on your Order No. 9-404

(1) Meet(s) the requirements of MIL-I-25135C (Amendment III), and are approved by the U. S. Air Force.

(2) Meet(s) the requirements of and have been tested for sulfur and halogens according to:
- (a) NAVSHIPS 250-1500-1 (Rev. 8 June 1971) Paragraph 12.5.1.1
- (b) MIL-STD-271D, NTR-1A, Paragraph 5.3
- (c) ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components Appendix IX, Paragraph IX 3630
- (d) ASME Boiler & Pressure Vessel Code, Section V, Nondestructive Examination, Paragraph T-630.
- (e) RDT Standard F3-6T, May 1974, Article 6, Paragraph T-630

Where sulfur is determined by ASTM D-129 or its allowed alternate ASTM D-1552 and halogens are determined by ASTM D-808. The following results were obtained:

Spotcheck Cleaner Type SKC-NF, Formula B. Batch No. 5D001
Residue .0037 g/100ml. (See note 3.)

Spotcheck Penetrant Type SKL-HF/SKL-S, Formula B. Batch No. 5C057
Residual Sulfur 0.0149 %
Residual Halogen 0.0072 %

Spotcheck Developer Type SKD-NF, Formula B. Batch No. 5C065
Residual Sulfur 0.1172 %
Residual Halogen 0.0177 %

(3) Is/Are free of mercury contamination, and no mercury bearing equipment was used in their manufacture.

MAGNAFLUX CORPORATION

J. T. Schmidt
Chief Control Chemist

7-8-75
Date

NOTE: 1. Our batch number appears on the bottom of all spray containers and on the label of all other containers.

NOTE: 2. Most specifications require test results stated in percent but some require parts per million (ppm). To convert "percent" figures to parts per million" multiply percent figure by ten thousand (10,000).

NOTE: 3. NAVSHIPS 250-1500-1, MIL-STD-271D, NTR-1A, and ASME Section V all require that material be subjected to ASTM D-1353 or a very similar procedure to evaporate off volatile solvents before analysis for sulfur and halogen. According to these specifications, only those residues higher than 0.005g./100ml shall be analyzed for sulfur and halogen. Lower residues shall be reported.

NOTE: 4. Appendix IX has been eliminated from current editions of the ASME Boiler Code, Section III. It has been superseded in this area by Section V.