NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

May 7, 1985

Docket No. 50-423
B11533

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: (1) B. J. Youngblood letter to W. G. Counsil, Safety Evaluation Report (NUREG-1031), dated August 2, 1984.

(2) B. J. Youngblood letter to W. G. Counsil, Request for Additional Information, dated March 7, 1985.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Response to Material Engineering Branch Question No. 250.12

Attached is Northeast Nuclear Energy Company's (NNECO) response to the Materials Engineering Branch Inservice Inspection Section request for additional information concerning the ultrasonic inspection technique used as part of Millstone Unit No. 3 Preservice Inspection (PSI) program. A UT demonstration was conducted at the Millstone Unit No. 3 site, as requested by SER Confirmatory Item No. 19, on November 9, 1984. We expect this response will resolve the Staff's concerns regarding the UT examinations.

If there are any questions, please contact our licensing representative.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

J. F. Opeka

J. F. Opeka
Senior Vice President

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

B001
1/40

Then personally appeared before me J. F. Opeka, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, an Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Lorraine J. D'Amico

Notary Public
My Commission Expires March 31, 1988

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

MATERIALS ENGINEERING BRANCH
INSERVICE INSPECTION SECTION

250.12 The SER described a confirmatory item concerning the effectiveness of the ultrasonic examination of cast stainless steel (CSS) elbows and pipes. The following additional information is needed to complete our evaluation:

A. Describe the evaluation and testing program that resulted in the conclusion that the instrumentation selected and examination procedures used represent the best available technology.

Response:

The evaluation and testing program that resulted in the conclusion that the instrumentation and examination procedures used, represent the best available technology, is documented in the Westinghouse topic report, WCAP-9894, "Reliability of Ultrasonic Test Method for Detecting Natural Fatigue Cracks in Centrifugally Cast Stainless Steel Pipe", dated June, 1981. A long range program to develop an ultrasonic testing reliability data bank for centrifugally cast stainless steel piping and weldments was initiated in 1976 using CF8A, type 304 cast pipe as the base material. WCAP-9894 documents the research program conducted to gather data needed (1) to determine the minimum through-wall depth of ID and OD fatigue cracks that can be reliably detected by ultrasonic testing methods and (2) to evaluate the influence of operator proficiency, crack location, and metallurgical structure on flaw detection.

The test data obtained during the program indicate that while centrifugally cast stainless steel is more difficult to ultrasonically examine than ferritic steels, it is possible to reliably detect fatigue cracks approximately 15 percent through-wall depth when proper test parameters are applied. These results were collaborated in a joint Westinghouse/PNL Study and were documented in NUREG/CR-3753, "An Evaluation of Manual Ultrasonic Inspection of Cast Stainless Steel Piping".

In addition to the above stated evaluation program by Westinghouse, NU in 1983 initiated a research project thru Rensselaer Polytechnic Institute (RPI) to evaluate current inspection techniques and try to develop improved techniques for UT exam of CSS piping.

The results of this research program were evaluated against the Westinghouse techniques and a decision was made by NU personnel to utilize the Westinghouse procedures, techniques and equipment based upon their apparent success in the industry.

B. The staff observed the examination of four welds during plant site demonstration on November 9, 1984. The staff reached the general conclusion that the ultrasonic transducer was not penetrating the weld from the elbow side and the examination from the pipe side was marginal because of the high electronic noise relative to the ultrasonic signal that must be interpreted. The staff considers the observation of a strong and consistent back-wall reflection around the circumference with the 0° transducer as a prerequisite to an effective angle beam examination of the weld and heat affected zone. During the demonstration, this condition was not observed at all locations around the weld, even though the outside diameter surface preparation was adequate to permit the required examination.

The preservice inspection of the majority of the CSS welds has been completed. In the event that the applicant has reached a conclusion different from the staff regarding the effectiveness of the overall ultrasonic inspection, provide the technical basis that is supported by the examination results.

Response:

It is not at all clear that a persistent 0° back-wall signal is necessary to ensure that an adequate angle beam examination can be made. At present, we find no documentation of relevant data correlating these two types of examinations nor data showing the quantitative extent of loss of back reflection.

Maintaining inside surface or back-wall reflections with a straight beam (0°) transducer should not be construed as the sole viable determinant that angle beams will penetrate in a similar manner. Positive evidence of sound beam penetration is dependent on the presence of favorably oriented reflectors. For example, a counterbore angle would serve as an excellent reflector to an angled sound beam, while it would divert and therefore offer no evidence of penetration for a straight beam.

However, we recognize that certain areas cannot be meaningfully examined ultrasonically, due to very poor acoustic properties of this material.

C. Field experience indicates that the examination results with CSS is dependent upon the microstructure and the weld specific. One basic calibration block was used to establish the ultrasonic parameters for the inspection of both the statically CSS elbows and the centrifugally CSS pipe and also the ferritic steam generator nozzle to elbow welds. This is not consistent with Section XI, Appendix III, Paragraph III - 3410 which requires that the basic calibration block be made from material of the same nominal diameter and nominal wall thickness as the pipe to be examined and Paragraph III - 3411(b) which requires, where the examination is to be performed from only one side of the joint, that the calibration block be of the same specification as the material on that side of the joint.

To address these subjects, the applicant should provide the following information:

1. The name of the manufacturer(s) and material specification of the four pipe spool pieces examined during the demonstration.

Response:

Ultrasonic inspections were conducted on four weldments in Loop #1 which join:

29" x 31"	50° Elbow to steam generator inlet nozzle
31"	40° Elbow to steam generator outlet nozzle
31"	40° Elbow to 31" pipe
31"	Pipe to 31" 90° elbow

The manufacturer's of the subject elbows, pipe and shop welding is as follows:

ITEM	VENDOR	PO	W SPECIFICATIONS	MATERIAL SPEC
Elbows	ESCO, CORP.	173697	G-678865, Rev. 2 (General) 679161, Rev. 3 (Plant Specific)	SA-351, CF8A
Pipe	Sandusky Foundry & Machine Co.	178043	G-678864, Rev. 1 with interim SPEC #1 (General) 679203, Rev. 4 (Plant Specific)	SA-351, CF8A

ITEM	VENDOR	PO	W SPECIFICATIONS	MATERIAL SPEC
Shop Fabrication Welding	Tubeco, Inc.	173686	G-678843, Rev. 3 with Interim Rev. 3 (General) 679194, Rev. 2 with Interim Rev. 1 (Plant Specific)	

2. A qualitative determination that most of the CSS pipe and fittings in the reactor coolant boundary was supplied by this manufacturer.

Response:

The above noted vendors supplied the pipe, elbows and fabrication for the reactor coolant system.

3. Manufacturer of the base material for the calibration block or that the block was fabricated from excess pipe from Millstone Unit No. 3.

Response:

The original calibration block supplied to NNECO from Westinghouse was in fact fabricated from an actual nozzle drop out of the Millstone Unit No. 3 primary loop piping. However, the thickness of this calibration block was not adequate to examine all thickness ranges of the installed piping system.

The actual calibration block used for PSI examinations was manufactured from a cast elbow. The material supplier was Newport News Shipbuilding. The material is SA-351 Grade CF8A, which is the same specification of those materials in the main loop piping. This satisfies the material and product form requirements of Section XI.

4. The technical basis for determining that one calibration block adequately represents the ultrasonic properties of all types of materials that were examined.

Response:

It is recognized that metallurgical variations can occur in this material. However, the calibration block used meets the requirements of Section XI Appendix III, paragraphs III-3410 and 3411(a) in that the calibration standard was fabricated from one of the materials specified for the piping being joined by the weld (i.e. elbow to steam generator nozzle).

5. Discussion of field measurements that were performed prior to or during the examinations that indicated that this calibration block provided an appropriate ultrasonic sensitivity (gain).

Response:

Since none were required, no measurements were performed prior to the examinations. However, evidence of penetration (ID surface reflectors) was noted and documented on the data report, as part of the examination results.

D. To resolve the issue of the effectiveness of the preservice inspection of the CSS, the applicant should present his conclusions regarding compliance with 10 CFR 50.55a(g)(3) on the following subjects:

1. The examination methodology, i.e., the examination procedure, instrumentation and calibration standard meet the requirements of Section XI.

Response:

This response will be submitted on or before June 15, 1985.

2. The examination results were meaningful, i.e., significant defects, if present, could have been detected in the volume required to be examined by Figure IWB-2500-8 of Section XI.

Response:

As previously noted, the conclusion of WCAP-9894 ("Reliability of Ultrasonic Test Method for Detecting Natural Fatigue Cracks in Centrifugally Cast Stainless Steel Pipe") for the test data obtained during the program indicate that while centrifugally cast stainless steel is more difficult to ultrasonically examine than are ferritic steels, it is possible to reliably detect cracks approximately 15 percent through-wall depth when the proper test parameters are applied. These results were collaborated in a joint Westinghouse/PNL Study and documented in NUREG/CR-3753, "An Evaluation of Manual Ultrasonic Inspection of Cast Stainless Steel Piping".

E. To support the applicant's conclusions, the staff requests that informational copies of the data sheets from any three welds be provided to illustrate the preservice inspection results. This data should indicate that a back-wall reflection was obtained and the wall thickness was measured with the 0° transducer. The angle beam data should illustrate the reporting and plotting of geometrical, metallurgical or flaw indications.

Response:

Attached you will find data sheets that represent Pre-service Inspection results.

F. Describe your future plans which will assure that each future inservice inspection program will utilize the best available technology.

When preparing the inservice inspection program, the results from the preservice inspection should be used among other considerations to select the welds with the best accoustical properties for future examinations.

Response:

As part of the Westinghouse Owners Group (WOG), Northeast Utilities is participating in a development program #MUHN-1074 titled "Demonstration of Flaw Detection and Characterization Capabilities for Ultrasonic Inspection of Main Coolant Loop Welds."

This program is designed to enhance the current defect detection and characterization reliability and to improve the efficiency of data collection for inspection of main coolant piping systems. The prime emphasis, though, will be to demonstrate an inspection technique(s) coupled with automated inspection and data processing equipment on carefully prepared test samples which represent to the fullest extent actual field conditions. This inspection system will be field usable.

When preparing the Millstone Unit No. 3 Inservice Inspection Program, in addition to ASME Section XI Code considerations, NNECO will select welds which show the best acoustical properties and have the best access for ultrasonic examination of the weld and required volume.

In summary, NNECO will perform examinations on main coolant loop welds using the best available technology, as part of our Inservice Inspection Program.

ATTACHMENT 1

PAGE 1 OF 3
151-206-4

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

WELD ULTRASONIC EXAMINATION PRESERVICE

PLANT: Millstone | UNIT: III | SKETCH: 25212-20910 Zone 012

SYST/COMP.: Reactor Coolant Pipe Loop 1 | PROCEDURE: ISI 206 Rev. 0

EXAMINER (LEVEL II): Gary A Moin II Edward R. Zollner - T | DATE: 2-20-85

EQUIPMENT	TRANSDUCER		STRAIGHT BEAM SCAN DIRECTION 0		AXIAL SCANS DIRECTIONS 2 & 5				CIRCUMFERENTIAL SCANS DIRECTIONS 7 & 8				CALIBRATION CHECK
INST. S/N: Sonic MK I 11224E	S/N				C 29801				C 29801				INITIAL TIME: IC: 0800 FC: 1140
	SIZE				1.0" DIA.				1.0" DIA.				
	FREQ				1.0 MHZ				1.0 MHZ				
	ANGLE				41° RL				41° RL				
REP RATE: 1k	CALIBRATION REFLECTOR LOCATION		SIGNAL AMPLITUDE	SWEEP POSITION	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	50% DAC LOCATIONS	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	50% DAC LOCATIONS	
REJECT: off	1/4 T				80%/80%+12	1.5			80%/80%+12	1.5			
DAMPING: Min	1/2 T				40%/80%+6	3.0			40%/80%+6	3.0			
FILTER: HI	3/4 T				20%/80%	4.5			20%/80%	4.5			FINAL TIME
LIN. CHECK: Sat													
SU CABLE: 12' Bnc-Bnc													CAL BLOCK: UT-7
COUPLANT: Sonotrace 40 8444	CAL GAIN				56/68dB				56/68dB				THICKNESS: 3.284" TEMP: 62°F

WELD NUMBER	TEMP	BASE METAL SCAN	SCAN DIRECTION 2	5	7/8	0	EXAMINATION LIMITATIONS AND REQUIRED VOLUME NOT EXAMINABLE (ESTIMATED %)	CROWN CONFIGURATION	RESULTS NI	NRI	RI	REMARKS
RCS-LP1 FW-5	+10°F		Yes	Yes	Yes		None	Flush	X			Item: #120
LP1-EC2 SW-8	+10°F		Yes	Yes	Yes		Pump Support 28%	Flush	X			Item: #190

Reviewed by: Ralph R. Hilton - / II 2-21-85

FOR INFORMATION ONLY

FORM 49000

ISI-206-4

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

LIMITATION TO EXAMINATION

PLANT MILLSTONE UNIT III SKETCH 25212-20910 ZONE 012

SYST/COMP REACTOR COOLANT PIPE LOOP 1 PROCEDURE ISI 206

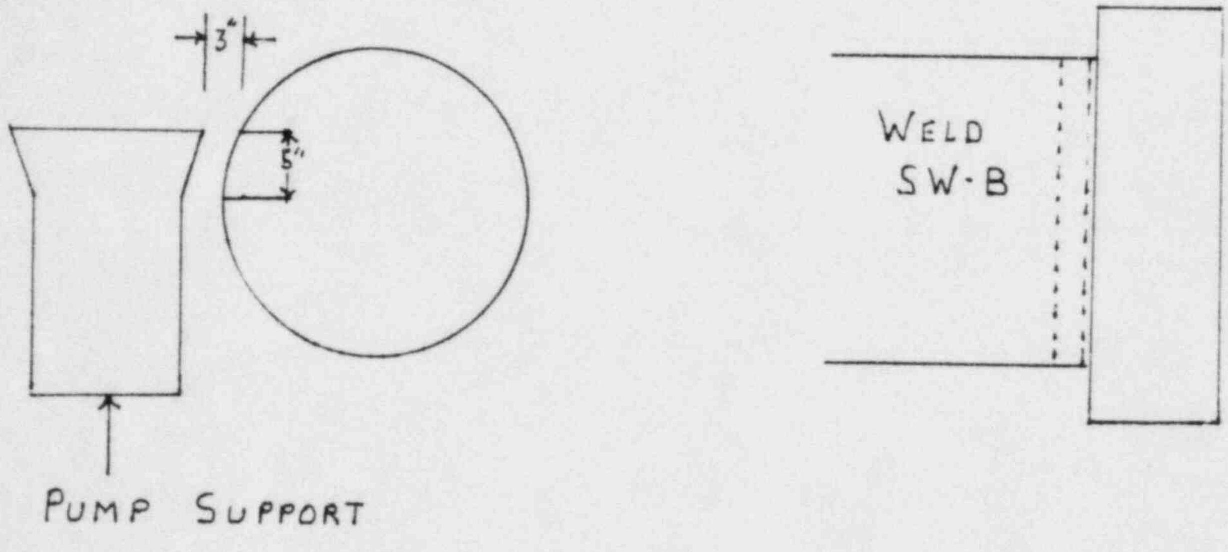
EXAMINER [signature] II DATE 2/20/85
LEVEL II

Reviewed by: [signature] III 2-21-85

RELATED TO: U/T ✓ P/T ___ M/T ___ V/T ___ ITEM(S) LP1-EC2-SW-B ITEM-190

PROVIDE GENERAL INFORMATION TO DESCRIBE APPROXIMATE SIZE, LOCATION AND TYPE OF LIMITATION

FOR INFORMATION ONLY



PAGE 3 of 3
151-206-4

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

ULTRASONIC INDICATION DATA

PLANT: Millstone	UNIT: III	SKETCH: 25212-20910 ZONE 012	
SYST/COMP: Reactor Coolant Pipe Loop 1		PROCEDURE: ISI 206 Rev. 0	
EXAMINER (LEVEL II): Gary A. Morin II Edward R. Zollner -T		DATE: 2-20-85	
LINEARITY AND CAL. CHECK: SAT.		CAL. BLOCK THICKNESS: 3.284"	

WELD NUMBER	INDICATION LENGTH		MIN. 50%		MIN. 100%		PEAK			MAX. 100%		MAX. 50%		BEAM		THICKNESS			REMARKS
	FROM	TO	SWP.	IN. TO REF.	SWP.	IN. TO REF.	SWP.	IN. TO REF.	* DAC AMPL.	SWP.	IN. TO REF.	SWP.	IN. TO REF.	ANGLE	DIR.	SURF. 2	WELD	SURF. 5	
RCS-21 FW-5	360°	intermittent					6.4	3.3"	100%					41° RL	2	3.63"	3.58"	3.85"	*
LPT-EC2 SW-B	360°	intermittent					4.8	3.5"	100%					41° RL	2	3.28"	2.73"	2.62"	*

* I.D. Geometry

FOR INFORMATION ONLY

Reviewed by: Robert R. Hilton /II 2-21-85

WESTINGHOUSE NUCLEAR SERVICE DIVISION INSPECTION SERVICES **WELD ULTRASONIC EXAMINATION PRESERVICE**	PLANT: MILLSTONE	UNIT: III	SKETCH: ZONE 012 25212-20910 FCN 55
	SYST/COMP.: REACTOR COOLANT LOOP 1		PROCEDURE: ISI-206
	EXAMINER/LEVEL II: Michael W. Blew II Dell W. McC I		DATE: 12-12-84

EQUIPMENT	TRANSDUCER		STRAIGHT BEAM SCAN DIRECTION 0		AXIAL SCANS DIRECTIONS 2 & 5				CIRCUMFERENTIAL SCANS DIRECTIONS 7 & 8				CALIBRATION CHECK
INST S/N: SONIC MARK I 07964E	S/N				K31335				K31335				INITIAL TIME: 08:15
	SIZE				1.0 Dia.				1.0 Dia.				
	FREQ				1.0 MHz				1.0 MHz				
	ANGLE				41° RL				41° RL				
REP RATE: 3K	CALIBRATION REFLECTOR LOCATION		SIGNAL AMPLITUDE	SWEEP POSITION	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	DISTANCE FROM SCRIBE/REF. LINE TO 50% DAC LOCATIONS	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	DISTANCE FROM SCRIBE/REF. LINE TO 50% DAC LOCATIONS	10:00 cc
REJECT: OFF	1/4T				80%/80%+12	1.5			80%/80%+12	1.5			13:45 cc
DAMPING: MIN	1/2T				40%/80%+6	3.0			40%/80%+6	3.0			
FILTER: Hi	3/4T				20%/80%	4.5			20%/80%	4.5			FINAL TIME: 15:00
LIN CHECK: SAT													
SU CABLE: 25' BNC-BNC													CAL. BLOCK: UT-7
COUPLANT: SONOTRACE 40 #8444	CAL. GAIN				61db/73db				61db/73db				THICKNESS: 3.284" TEMP: 72°

WELD NUMBER	TEMP	BASE METAL SCAN	SCAN DIRECTION 2	5	7/8	0	EXAMINATION LIMITATIONS AND REQUIRED VOLUME NOT EXAMINABLE (ESTIMATED %)	CROWN CONFIGURATION	RESULTS NI	NRI	RI	REMARKS
3C2-121-C	0°		YES	YES	YES		NOZZLE CONFIGURATION 25%	FLUSH	X			ITEM 10
RC-LP1-FN-1	0°		YES	YES	YES		NONE	FLUSH	X			ITEM 20

FOR INFORMATION ONLY

Reviewed by Rlf K. Kittle LE 12-14-84

FORM 49000

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

ULTRASONIC INDICATION DATA

PLANT: MILLSTONE	UNIT: III		SKETCH ZONE 12: 25212-20910 FCN 55
SYST/COMP: REACTOR COOLANT LOOP 1			PROCEDURE: 151-206
EXAMINER (LEVEL II): Michael W Blew II, William W. McClee I			DATE: 12-12-84
LINEARITY AND CAL. CHECK: SAT		CAL. BLOCK THICKNESS: 3.284"	

WELD NUMBER	INDICATION LENGTH		MIN. 50%		MIN. 100%		PEAK			MAX. 100%		MAX. 50%		BEAM		THICKNESS			REMARKS
	FROM	TO	SWP.	IN. TO REF.	SWP.	IN. TO REF.	SWP.	IN. TO REF.	% DAC AMPL.	SWP.	IN. TO REF.	SWP.	IN. TO REF.	ANGLE	DIR.	SURF. 2	WELD	SURF. 5	
302-121-C	360° INTERMITTENT						5.2	.5"	75%					41°	2	2.73"	2.69"	NA	*
RCS 1-P1 FW-1	360° INTERMITTENT						4.6	2.5"	100%					41°	5	2.54"	2.51"	2.73"	*

* FOR INFORMATION ONLY - I.D. GEOMETRY

FOR INFORMATION ONLY

Reviewed by Ruth R. Stalter III 12-14-84

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

WELD ULTRASONIC EXAMINATION PRESERVICE

PLANT	MILLSTONE
UNIT	III
SKETCH	25212-20910 RCU 55
SYST/COMP.	REACTOR COOLANT PIPE LOOP 1
PROCEDURE	ISI-206
EXAMINER (LEVEL II)	Michael W Blew II, Gary A Moore II
DATE	11-16-84

EQUIPMENT	TRANSDUCER		STRAIGHT BEAM SCAN DIRECTION 0		AXIAL SCANS DIRECTIONS 2 & 5				CIRCUMFERENTIAL SCANS DIRECTIONS 7 & 8				CALIBRATION CHECK
INST. S/N SONIC MARK I 0620BE	S/N		H25352										INITIAL TIME 0850
	SIZE		1.0" DIA										
	FREQ.		1.0 MHZ										
	ANGLE		0°										
REP RATE 1K	CALIBRATION REFLECTOR LOCATION		SIGNAL AMPLITUDE	SWEEP POSITION	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	50% DAC LOCATIONS	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	50% DAC LOCATIONS	1130
REJECT OFF													1300
DAMPING MIN	1/4 T		80%	1.5									
FILTER HI	1/2 T		50%	3.0									
LIN. CHECK SAT	3/4 T		20%	4.5									FINAL TIME 1510
SU CABLE 12 BNC-BNC	1 T			6.0									CAL. BLOCK UT-7
COUPLANT SONOTRACE 40 3U 8444	CAL. GAIN		45 db										THICKNESS 3.284" TEMP. 68°

FOR INFORMATION ONLY

WELD NUMBER	TEMP.	BASE METAL SCAN	SCAN DIRECTION 2	5	7/8	0	EXAMINATION LIMITATIONS AND REQUIRED VOLUME NOT EXAMINABLE (ESTIMATED %)	CROWN CONFIGURATION	RESULTS NI	NRI	RI	REMARKS
302-121-C	-4°	YES				YES		FLUSH			X	ITEM # 10
RCS-LPI-FW-1	-4°	YES				YES		FLUSH	X			ITEM # 20
LPI-CL2A SW-B	-4°	YES				YES		FLUSH	X			ITEM # 340
RCS-5-FW-10	-4°	YES				YES		FLUSH	X			ITEM # 350
301-121-C	-4°	YES				YES		FLUSH	X			ITEM # 360

Reviewed by Robert H. Hilton /s 12-14-84

FORM 49000

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

ULTRASONIC INDICATION DATA

PLANT: MILLSTONE
UNIT: III
SKETCH: ZONE 12 25212-20910 FCN 55
SYST/COMP: REACTOR COOLANT PIPE LOOP 1
PROCEDURE: ISI-206
EXAMINER (LEVEL II): Michael W. [illegible] II
DATE: 11-16-84
LINEARITY AND CAL. CHECK: SAT.
CAL. BLOCK THICKNESS: 3.284"

WELD NUMBER	INDICATION LENGTH		MIN. 50%		MIN. 100%		PEAK			MAX. 100%		MAX. 50%		BEAM		THICKNESS			REMARKS
	FROM	TO	SWP.	IN. TO REF.	SWP.	IN. TO REF.	SWP.	IN. TO REF.	% DAC AMPL.	SWP.	IN. TO REF.	SWP.	IN. TO REF.	ANGLE	DIR.	SURF. 2	WELD	SURF. 5	
302-121-C	92.8"	SPOT					3.6	1.6"	100%					0°	2 SIDE	2.73	2.68"	NA	

FOR INFORMATION ONLY

Reviewed by [illegible] /II 12-14-84

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT Millstone UNIT III SKETCH 25212-20910 zone 12 ECN 55

SYST COMP Reactor Coolant Pipe Loop 1 PROCEDURE 151-206

EXAMINER Michael D Blew II LEVEL II DATE 11-16-84

Reviewed by Ron Hitterman Ronald R. Hitterman III 12-14-84

DETECTED BY U/T X P/T ____ M/T ____ V/T ____ IDENT NO 302-121-C. Item # 10

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

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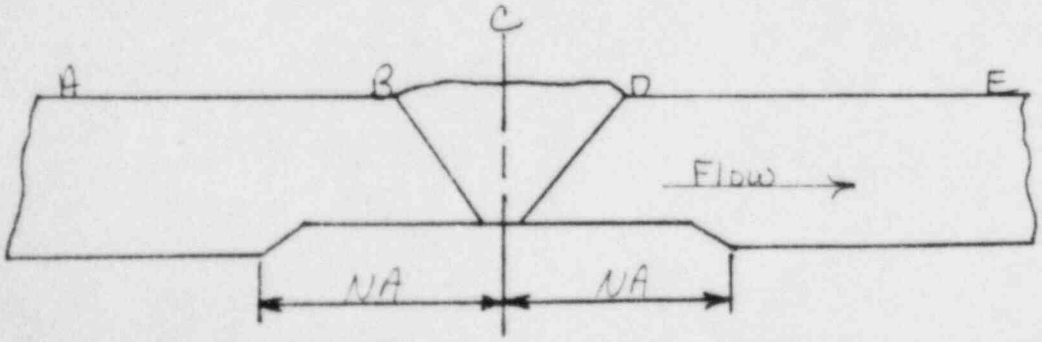
	0°	90°	180°	270°
A	NA	NA	NA	NA
B	NA	NA	NA	NA
C	2.737	2.682	2.737	2.627
D	2.737	2.737	2.737	2.737
E	2.737	2.737	2737	2.737



151-206-2

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT Millstone UNIT III SKETCH 2-212-20910 zone 12 ECN 55

SYST/COMP Reactor Coolant Pipe Loop 1 PROCEDURE 151-206

EXAMINER [signature] II LEVEL II DATE 11-16-84

Reviewed by [signature] /III 12-14-84

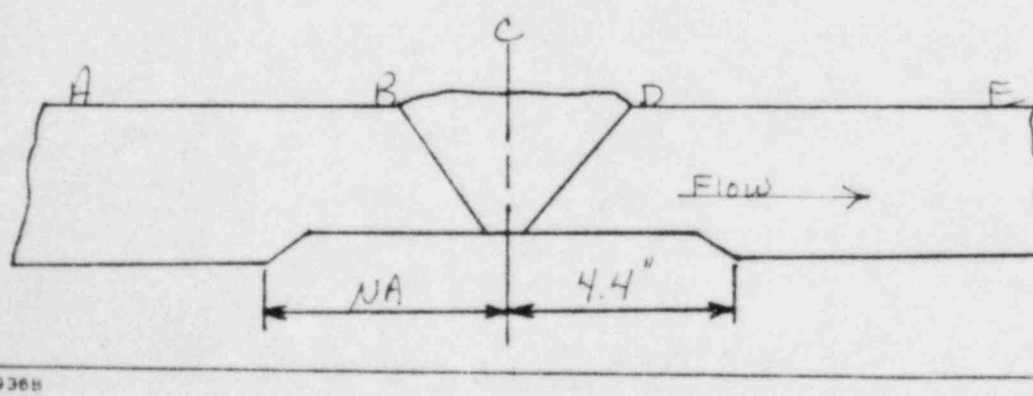
DETECTED BY U/T X P/T ____ M/T ____ V/T ____ IDENT NO RCS-LP-1-FW-1 Item #20

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	2.737	2.737	2.737	2.737
B	2.737	2.737	2.737	2.737
C	2.627	2.518	2.463	2.572
D	2.354	2.463	2.408	2.408
E	2.518	2.572	2.518	2.518



FORM 459368

ISI-206-2

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT Millstone UNIT III SKETCH 25212-20910 zone 12 FCN 55

SYST/COMP Reactor Coolant Pipe Loop 1 PROCEDURE ISI-206

EXAMINER Michael W Blew II LEVEL II DATE 11-16-84

Reviewed by Ruhl K. Hilton III 12-14-84

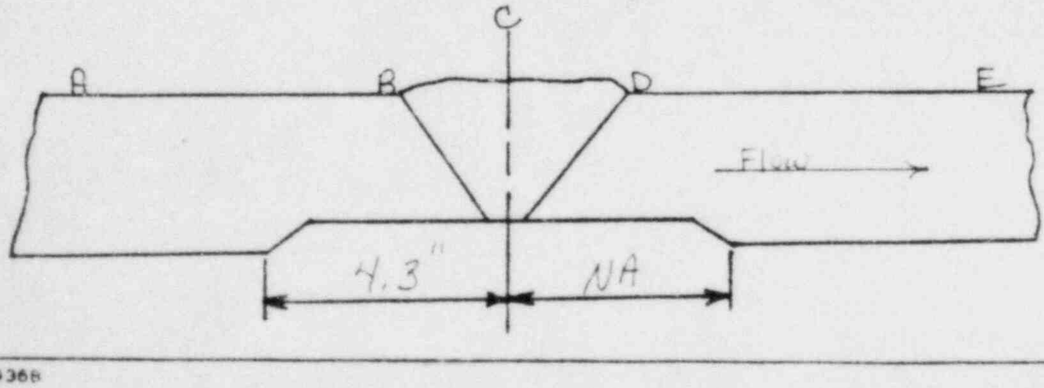
DETECTED BY U/T X P/T ___ M/T ___ V/T ___ IDENT NO LP1-CL2 A-SW-B Item # 340

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	2.463	2.408	2.463	2.463
B	2.244	2.354	2.354	2.354
C	2.463	2.463	2.299	2.463
D	2.737	2.901	2.354	2.737
E	2.737	3.065	2.737	2.901



WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT Millstone UNIT III SKETCH 25212-20910 zone 12 FCN 55

SYST COMP Reactor Coolant Pipe Loop 1 PROCEDURE ISI-206

EXAMINER Michael W. Blew II LEVEL II DATE 11-16-84

Reviewed by Ralph H. Hilton III 12-14-84

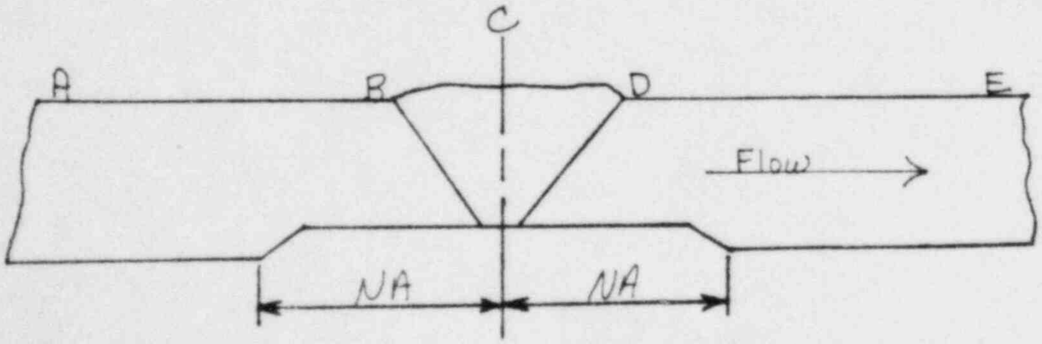
DETECTED BY U/T X P/T ____ M/T ____ V/T ____ IDENT NO RCS-5-FW-10 Item # 350

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	NA	NA	NA	NA
B	NA	NA	NA	NA
C	2.518	2.408	2.463	2.463
D	2.463	2.518	2.518	2.518
E	2.518	2.518	2.518	2.518



WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT Millstone UNIT III SKETCH 25212-20910 zone 12 FCN 55

SYST/COMP Reactor Coolant Pipe Loop 1 PROCEDURE 151-206

EXAMINER [signature] II LEVEL II DATE 11-16-84

Reviewed by [signature] /II 12-14-84

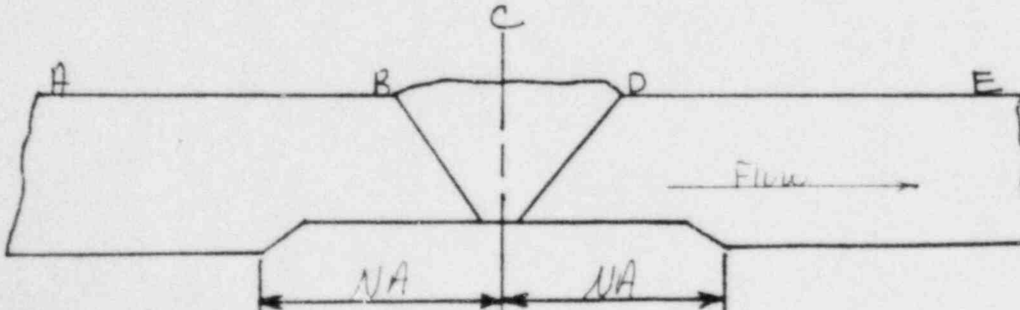
DETECTED BY U/T X P/T ____ M/T ____ V/T ____ IDENT NO. 301-121-C Item # 360

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	2.518	2.518	2.518	2.518
B	2.463	2.572	2.572	2.518
C	2.463	2.518	2.572	2.518
D	NA	NA	NA	NA
E	NA	NA	NA	NA



WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

WELD ULTRASONIC EXAMINATION PRESERVICE

PLANT: MILLSTONE
UNIT: III
SKETCH: 25212-~~20910~~ 20910 2C-NE012
SYST/COMP: REACTOR COOLANT PIPING LOOP 1
PROCEDURE: 151-206 RHC 2/19/85
EXAMINER (LEVEL II): Robert H Cline II William G Halley I
DATE: 2/19/85

EQUIPMENT	TRANSDUCER		STRAIGHT BEAM SCAN DIRECTION 0	
INST S/N: SONIC MK I 11223E	S/N		J06859	
	SIZE		1.0" DIA	
	FREQ		1.0 MHZ	
	ANGLE		0°	
REP RATE: 3K	CALIBRATION REFLECTOR LOCATION		SIGNAL AMPLITUDE	SWEEP POSITION
REJECT: OFF	1/4		80%	1.5
DAMPING: MIN	1/2		60%	3.0
FILTER: HI	3/4		18%	4.5
LIN CHECK: SAT	1T			6.0
SU CABLE: 12' BNC-BNC				
COUPLANT: SONOTRACE 40 8444	CAL. GAIN		43db	

AXIAL SCANS DIRECTIONS 2 & 5			
SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	DISTANCE FROM SCRIBE/REF. LINE TO 50% DAC LOCATIONS

CIRCUMFERENTIAL SCANS DIRECTIONS 7 & 8			
SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO PEAK	DISTANCE FROM SCRIBE/REF. LINE TO 50% DAC LOCATIONS

FOR INFORMATION ONLY

CALIBRATION CHECK	
INITIAL TIME	0950
CC	1250
FINAL TIME	1630
CAL. BLOCK	UT-7
THICKNESS	3.284"
TEMP.	67°F

WELD NUMBER	TEMP	BASE METAL SCAN	SCAN DIRECTION 2	5	7/8	0	EXAMINATION LIMITATIONS AND REQUIRED VOLUME NOT EXAMINABLE (ESTIMATED %)	CROWN CONFIGURATION	RESULTS NI	NRI	RI	REMARKS
RCS-LP1 FW-5	+5°F	YES				YES		GROUND FLUSH	X			ITEM #120

REVIEWED by: Ralph R. Kitten 2-20-85

151-206-3

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT MILLSTONE UNIT III SKETCH 25712-~~20810~~ 20910 RHC 2/19/85 ZONE 012

SYST/COMP REACTOR COOLANT PIPING LOOP 1 PROCEDURE 151-206

EXAMINER Robert H. Cline II LEVEL II DATE 2-19-85

Reviewed by: Ralph V. Kittle – LIII 2-20-85

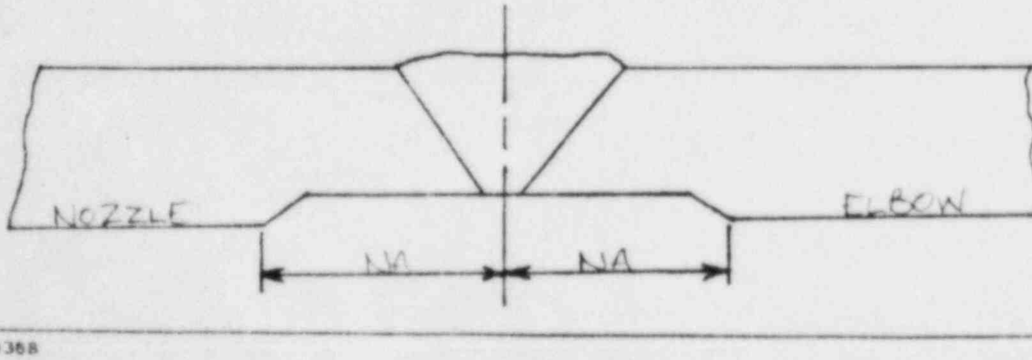
DETECTED BY U.T. ✓ P.T. ___ M.T. ___ V.T. ___ IDENT NO RCS-LP1-FW-5 ITEM No. 120

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	4.95"	4.95"	4.95"	4.95"
B	3.85"	3.85"	3.74"	3.85"
C	3.52"	3.52"	3.47"	3.63"
D	3.63"	3.58"	3.52"	3.52"
E	3.63"	3.41"	3.52"	3.63"



WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

WELD ULTRASONIC EXAMINATION PRESERVICE

PLANT: MILLSTONE
UNIT: III
SKETCH: 25212-20910 FCN 55
SYST/COMP: REACTOR COOLANT PIPE LOOP 1 ZONE 12
PROCEDURE: 151-206
EXAMINER LEVEL II: Michael W Blew II
DATE: 11-11-84

EQUIPMENT	TRANSDUCER		STRAIGHT BEAM SCAN DIRECTION 0		AXIAL SCANS DIRECTIONS 2 & 5				CIRCUMFERENTIAL SCANS DIRECTIONS 7 & 8				CALIBRATION CHECK
INST. S/N: SONIC MARK I 06208E	S/N		H25351										INITIAL TIME: 0745
	SIZE		1.0" DIA										
	FREQ.		1.0 MHZ										
	ANGLE		0°										1010 CHECK
REP. RATE: 1K	CALIBRATION REFLECTOR LOCATION		SIGNAL AMPLITUDE	SWEEP POSITION	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO: PEAK	50% DAC LOCATIONS	SIGNAL AMPLITUDE	SWEEP POSITION	DISTANCE FROM SCRIBE/REF. LINE TO: PEAK	50% DAC LOCATIONS	
REJECT: OFF													
DAMPING: MIN	1/4 T		80%	1.5									
FILTER: HI	1/2 T		55%	3.0									FINAL TIME: 1130
LIN. CHECK: SAT	3/4 T		10%	4.5									
SU CABLE: 24' BNC-BNC	1 T			6.0									CAL. BLOCK: UT-7
COUPLANT: SONOTRACE 40 #VB440	CAL. GAIN		47 db										THICKNESS: 3.284" TEMP: 63°F

FOR INFORMATION ONLY

WELD NUMBER	TEMP	BASE METAL SCAN	SCAN DIRECTION 2	5	7/8	0	EXAMINATION LIMITATIONS AND REQUIRED VOLUME NOT EXAMINABLE (ESTIMATED %)	CROWN CONFIGURATION	RESULTS NI	NRI	RI	REMARKS
RCS-LP1-FW-7	+2°	YES				YES		FLUSH	X			ITEM # 150
RCS-LP1-FW-EC2-BMR	+2°	YES				YES		FLUSH	X			ITEM # 190
RCS-LP1-FW-8	+2°	YES				YES		FLUSH	X			ITEM # 200
LP1-CL2A-SW-D	+2°	YES				YES		FLUSH	X			ITEM # 290
RCS-S-FW-9	+2°	YES				YES		FLUSH	X			ITEM # 280
RCS-LP1-FW-CL2A-1FWB	+2°	YES				YES		FLUSH	X			ITEM # 310

Reviewed by [signature] /III 12-14-84

ISI-206-10

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT MILLSTONE UNIT III SKETCH 25212-20910 FCN535

SYST.COMP REACTOR COOLANT PIPE LOOP 1 ZONE 12 PROCEDURE ISI-206

EXAMINER Michael W Blew II LEVEL II DATE 11-11-84

Reviewed by Rudolf R. Ritter LIII 12-14-84

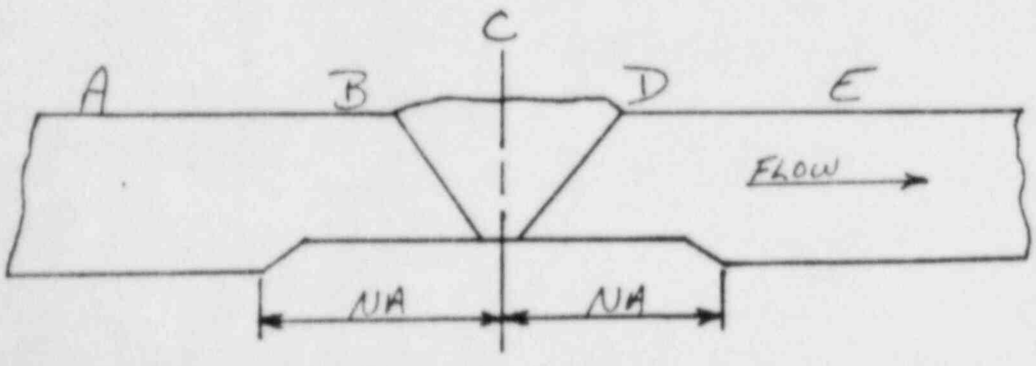
DETECTED BY U.T. ✓ P.T. ____ M.T. ____ V.T. ____ IDENT NO. RCS-LP1-FW-7
ITEM # 150

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	3.17"	2.84"	2.95"	2.73"
B	2.68"	2.73"	2.84"	2.62"
C	2.51"	2.62"	2.51"	2.40"
D	2.40"	2.51"	2.40"	2.40"
E	2.62"	2.57"	2.57"	2.51"



FORM 459368

151-206-10

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT MILLSTONE UNIT III SKETCH 25212-20910 FCN 55

SYST/COMP REACTOR COOLANT PIPE LOOP 1 ZONE 12 PROCEDURE 151-206

EXAMINER Michael V Blew II LEVEL II DATE 11-11-84

Reviewed by Rh R. Hatton LII 12-14-84

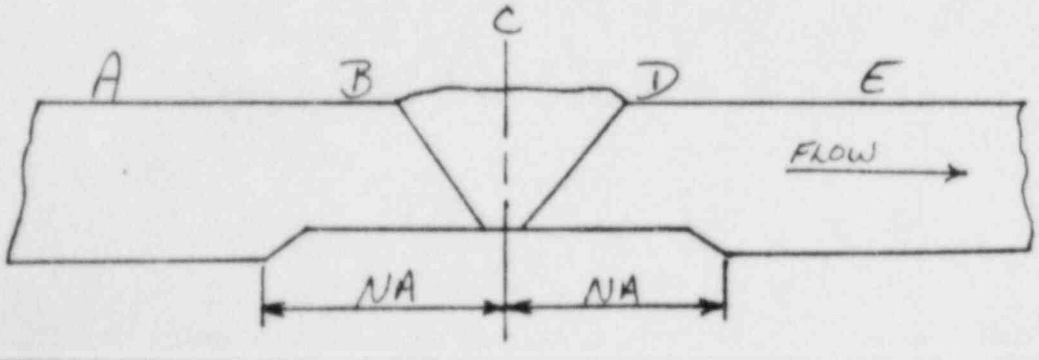
DETECTED BY U/T ✓ P/T ____ M/T ____ V/T ____ IDENT NO RCS-LP1-FW-EC2-BMR
ITEM # 190

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	2.62"	2.51"	2.73"	2.62"
B	2.62"	2.51"	2.51"	2.51"
C	2.73"	2.51"	2.73"	2.73"
D	3.06"	2.73"	2.84"	2.84"
E	3.284"	2.73"	2.84"	2.73"



151-206-10

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT MILLSTONE UNIT III SKETCH 25212-20910 RCN 55

SYST COMP REACTOR COOLANT PIPE LOOP 1 ZONE 12 PROCEDURE 151-206

EXAMINER Michael W Blow II LEVEL II DATE 11-11-84

Reviewed by [signature] II 12-14-84

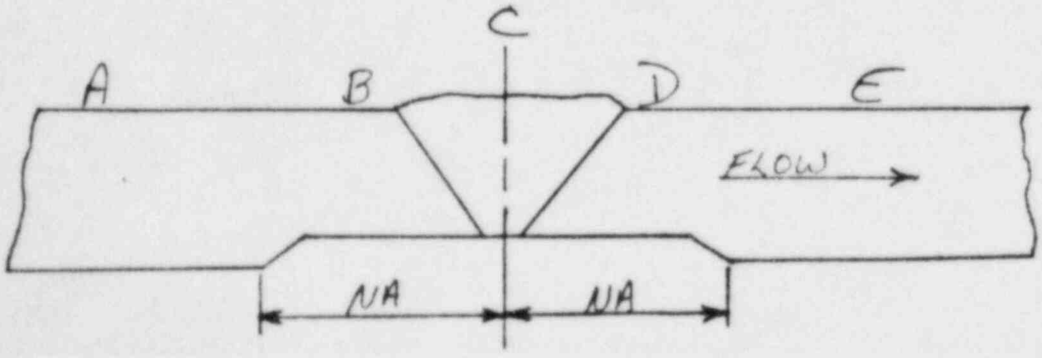
DETECTED BY U/T ✓ P/T ____ M/T ____ V/T ____ IDENT NO RCS-LP1-FW-8
ITEM # 200

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	4.05"	3.28"	3.28"	3.17"
B	3.28"	3.28"	3.28"	3.28"
C	3.28"	3.28"	3.28"	3.28"
D		R.C.		
E		PUMP		



FORM 459368

151-206-10

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT MILLSTONE UNIT III SKETCH 25212-20910 FCN 55

SYST. COMP. REACTOR COOLANT PIPE LOOP 1 ZONE 12 PROCEDURE 151-206

EXAMINER Michael W Blew II LEVEL II DATE 11-11-84

Reviewed by [signature] III 12-14-84

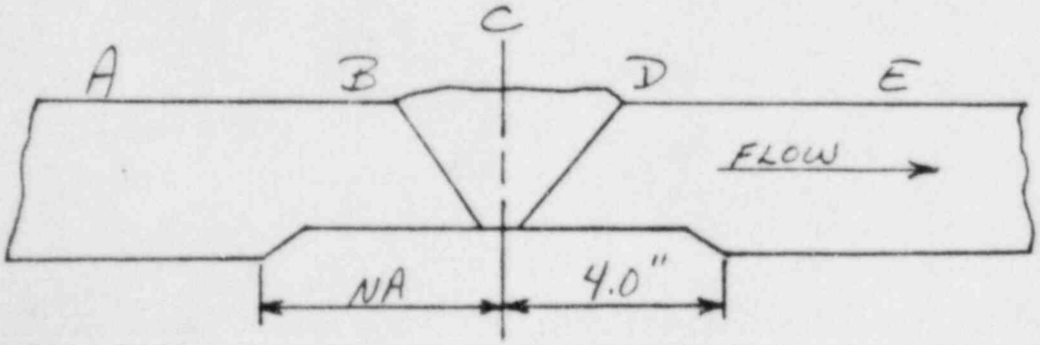
DETECTED BY U/T ✓ P/T ______ M/T ______ V/T ______ IDENT NO. RCS-5-FW-9
ITEM # 280

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	VALVE			
B				
C	2.40"	2.40"	2.51"	2.40"
D	2.18"	2.18"	2.18"	2.18"
E	2.29"	2.29"	2.29"	2.29"



FORM 459368

151-206-10

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT MILLSTONE UNIT III SKETCH 25212-20910 FCN55

SYST/COMP REACTOR COOLANT PIPE LOOP1 ZONE 12 PROCEDURE 151-206

EXAMINER Michael W. Blow II LEVEL II DATE 11-11-84

Reviewed by Rich H. Hatton [illegible] 12-14-84

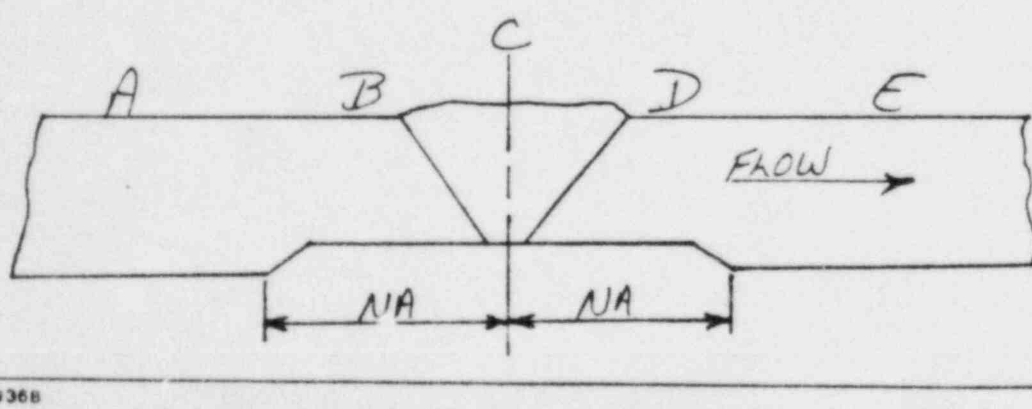
DETECTED BY U/T ✓ P/T ____ M/T ____ V/T ____ IDENT NO. LP1-CL2A-SW-D
ITEM # 290

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA.

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A	NOZZLE			
B	NOZZLE			
C	NOZZLE			
D	2.29"	2.29"	2.29"	2.29"
E	2.29"	2.29"	2.29"	2.29"



151-206-10

WESTINGHOUSE NUCLEAR SERVICE DIVISION
INSPECTION SERVICES

GENERAL – INDICATION DATA

PLANT: MILLSTONE UNIT: III SKETCH: 25212-20910 FC 55

SYST./COMP: REACTOR COOLANT PIPE LOOP 1 ZONE 12 PROCEDURE: 151-206

EXAMINER: Michael W. Blue II LEVEL II DATE: 11-11-84

Reviewed by: Robert R. Hetter III 12-14-84

DETECTED BY: U/T ✓ P/T ____ M/T ____ V/T ____ IDENT NO. RCS-LP1-FW-CL2A-1FAR

ITEM # 310

PROVIDE SUFFICIENT INFORMATION TO DESCRIBE SIZE, LOCATION AND TYPE OF INDICATION. DESCRIBE EXTRA OR SPECIAL EQUIPMENT IF USED FOR SIZING OR REPORTING. IF NECESSARY INCLUDE SKETCH SHOWING GENERAL CONFIGURATION OF ITEM OR AREA

FOR INFORMATION ONLY

FOR INFORMATION ONLY

	0°	90°	180°	270°
A		NOZZLE		
B		NOZZLE		
C		NOZZLE		
D	2.29"	2.29"	2.29"	2.29"
E	2.29"	2.29"	2.29"	2.29"