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DRESDEN NUCLEAR GENERATING STATION
UNIT 2
REPAIR PROGRAM FOR
RECIRCULATION RISERS

Prepared for
Commonwealth Edison Company

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A3b	4			

TABLE OF CONTENTS

	<u>Page</u>
A. DESCRIPTION	1
B. ORIGINAL CODE OF CONSTRUCTION	1
C. CODE OF REPAIR	1
D. FLAW DESCRIPTION AND FAILURE MODE EVALUATION	1
E. REPAIR REQUIREMENTS	2
F. QUALITY ASSURANCE REQUIREMENTS	3
G. DOCUMENTATION	3
APPENDICES	A.0
Flaw Location and Description	A.1
Type 1 Weld Overlay Configuration	A.3a
Type 2 Weld Overlay Configuration	A.3b

REPAIR PROGRAM

A. DESCRIPTION

This program addresses the repair of flaws in elbow joints in several of the 12" recirculation risers. The repairs will consist of welded overlays as shown in Appendix A.2. Overlays will extend beyond the extremities of axial flaws and will provide improved residual stress conditions on the inside of the piping as well as reinforcing the joint area.

B. ORIGINAL CODE OF CONSTRUCTION

The recirculation system piping outboard of the safe end to pipe weld was designed and constructed in accordance with ASME Code Section I, 1965 Edition with Addenda through Winter 1966. The original Design Specification, K-2202 by Sargent & Lundy, contained additional requirements.

C. CODE OF REPAIR

1. The repairs will meet the requirements of the ASME Code, Section XI, 1974 Edition with Addenda through Summer 1975. In addition, guidance will be taken from the 1980 Edition of Section XI with Addenda through Winter 1981.
2. As allowed by ASME Section XI, repairs shall be performed in accordance with the original Code of Construction and Design Specification referenced in Section B, except as modified in Section E, Repair Requirements.

D. FLAW DESCRIPTION AND FAILURE MODE EVALUATION

1. The flaws are circumferential and axial intergranular stress corrosion cracks (IGSCC) located in the elbow to pipe welds in the 12" Recirculation Riser lines. A complete tabulation of flaw locations and descriptions is given in Appendix A.1.
2. The flaws were revealed by ultrasonic examination.
3. In order to inhibit the flaw growth, weld overlays will be made over the affected weld joints. A weld overlay will induce a compressive residual stress field in the flawed region, thereby inhibiting the progress of IGSCC.

E. REPAIR REQUIREMENTS

1. Existing Material
 - a. Piping: ASTM A358 Gr. 304
 - b. Fittings: ASTM A403 Gr. WP304 or ASTM A336 CL.F8
 - c. Weld filler metal: unknown
2. New Material
 - a. Weld filler metal: Type 308L stainless steel
3. Design
 - a. Design of the weld overlay shall assure that the original design parameters are met using the Net Section Collapse methodology of proposed Section XI Article IWB-3640.
 - b. Physical dimensions of the weld overlay are given in Appendix A.2. The Type 1 weld overlay configuration will be used for all flaws identified in this program. The Type 2 weld overlay is for reference only, and may be used only as directed by SNED.
4. Fabrication
 - a. All welding shall be performed in accordance with welding procedure specifications qualified in accordance with ASME Section IX.
 - b. All welders shall be qualified in accordance with ASME Section IX.
 - c. The repair is exempt from postweld heat treatment.
 - d. Benchmarks shall be installed on the pipe to facilitate measurement of shrinkage induced by weld overlays. Measurements across the overlay area will be recorded before and after welding to detect any change in axial length.
5. Examination
 - a. Each overlay shall be examined by the liquid penetrant (PT) method in accordance with the latest revision of Commonwealth Edison Procedure NDT-D-2. PT shall be extended to include base

metal within one inch of each end of the overlay. All findings shall be reported for resolution.

- b. An ultrasonic examination shall be performed in accordance with Commonwealth Edison Special Process Procedures to establish the soundness of the weld overlay and its fusion to the base metal. All findings shall be reported for resolution.
- c. An ultrasonic examination shall be performed to provide a new baseline for Inservice Inspection. Ultrasonic examination shall be performed in accordance with the latest revision of Commonwealth Edison Procedures NDT-C-2.

6. Testing

A hydrostatic pressure test is being performed as part of the normal inservice inspection program in accordance with Article IWA-5000 of ASME Section XI. The test may be performed prior to completion of all overlays.

7. Code Stamping

Code stamping of the repair is not required and shall not be performed.

F. QUALITY ASSURANCE REQUIREMENTS

All work shall be performed in accordance with Commonwealth Edison's Quality Assurance Program.

G. DOCUMENTATION

- 1. The repairs will be documented on Form NIS-2 "Owners Report of Repair or Replacement," or equivalent form as specified by the Owner's Authorized Inspection Agency.
- 2. The following records will be permanently maintained at the Dresden Nuclear Generating Station:
 - 1. Certified material test reports (CMTRs) for the filler material.
 - 2. Welding procedure specifications and qualification records.
 - 3. Records of welder and welding operator qualifications.
 - 4. Nondestructive examination procedures and personnel qualifications.

5. Nondestructive examination reports.
6. As-built drawings or sketches of the UT calibration block.
7. Section XI repair program (this document).
8. Certified design report for repair.
9. As-built drawings or sketches.
10. System pressure test records.

APPENDICES

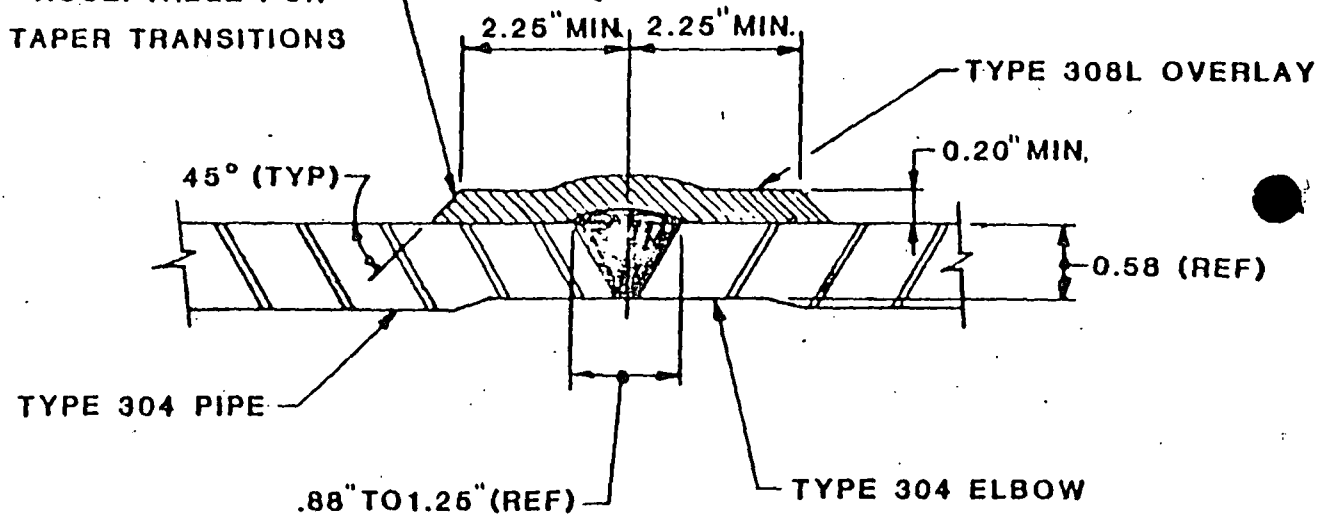
FLAW LOCATION AND DESCRIPTION

<u>Recirculation Riser Line # and Nozzle</u>	<u>Weld #</u>	<u>Overlay Type</u>	<u>Radial Location (o'clock)</u>	<u>Orientation</u>	<u>Description</u>
2-0201H-12" Nozzle 2A	PD4-D23 (Bottom)	1	11:30	Axial	1/2" x 27% wall - elbow side
			9:00	Axial	3/8" x 14% wall - elbow side
			1:30	Axial	5/8" x 26% wall - pipe & elbow
			6:00	Circumfer- ential	1/2" x 19% wall - pipe side
			1:00	Circumfer- ential	7/16" x 13% wall - pipe side
2-0201M-12" Nozzle 2E	PD19-D13 (Top)	1	6:00	Axial	3/4" x 19% wall - elbow side
			11:00	Axial	1-1/8" x 10% wall - pipe side
	PD19-D14 (Bottom)	1	4:00	Circumfer- ential	1-1/2" x 24% wall - elbow side
2-0201C-12" Nozzle 2F	PD7-D11 (Top)	1	6:30	Circumfer- ential	1-1/2" x 14% wall - elbow side
			8:30	Axial	9/16" x 16% wall - pipe side
2-0201E-12" Nozzle 2H	PD9-D8 (Bottom)	2	6:00	Circumfer- ential	3/4" x 30% wall - pipe side
2-0201F-12" Nozzle 2J	PD2-D4 (Top)	1	7:00	Axial	1" x 27% wall - elbow side
			10:30	Axial	1/2" x 19% wall - pipe side
2-0201G-12" Nozzle 2K	PD3-D2 (Bottom)	1	1:00	Axial	1/4" x 23% wall - pipe side
			4:30	Axial	1/4" x 14% wall - pipe side
			10:00	Axial	3/16" x 21% wall - pipe side
			10:30	Axial	1/4" x 14% wall - pipe side

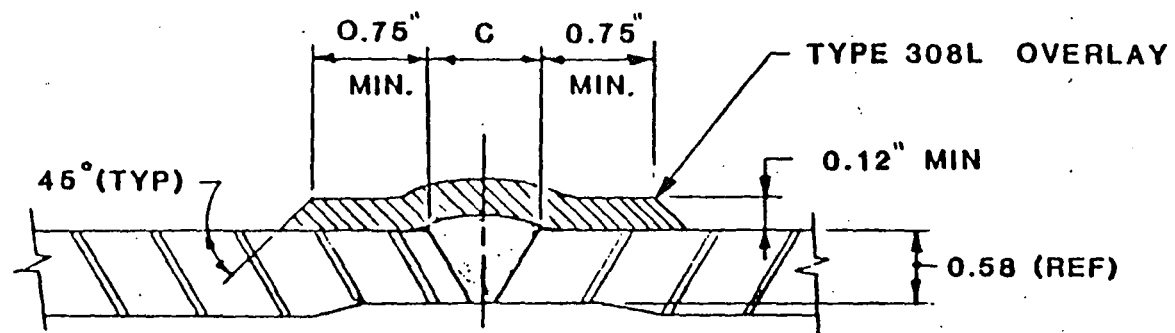
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Revision 4

A.1

AS WELDED SURFACE
ACCEPTABLE FOR
TAPER TRANSITIONS



TYPE 1
WELD OVERLAY CONFIGURATION
FOR THE RECIRCULATION INLET



- Notes:
1. C = Width of Weld Face
 2. This overlay configuration is for reference, only.
This design may be used only as directed by SNED.

TYPE 2
WELD OVERLAY CONFIGURATION
FOR THE RECIRCULATION INLET