



April 21, 2005

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit No. 2; Docket No. 50-318; License No. DPR 69
Licensee Event Report 2005-001
Ultrasonic Testing Identifies Two Alloy 600 Nozzles Requiring Repair

The attached report is being sent to you as required by 10 CFR 50.73. Should you have questions regarding this report, we will be pleased to discuss them with you.

Very truly yours,

A handwritten signature in black ink, appearing to read "DAH", written over a horizontal line.

David A. Holm
Plant General Manager

DAH/JTJ/bjd

Attachment: As stated

cc: R. V. Guzman, NRC
S. J. Collins, NRC

Resident Inspector, NRC
R. I. McLean, DNR

IE22

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME Calvert Cliffs Nuclear Power Plant, Unit 2	2. DOCKET NUMBER 05000 318	3. PAGE 1 OF 004
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4. TITLE Ultrasonic Testing Identifies Two Alloy 600 Nozzles Requiring Repair
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5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	26	2005	2005	- 001 -	00	04	21	2005		05000
										05000

9. OPERATING MODE 5	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 000	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER						
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Michael J. Yox, Senior Engineering Analyst	TELEPHONE NUMBER (Include Area Code) 410-495-6652
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On February 24, 2005, with Unit 2 in Mode 5, ultrasonic (UT) inspections of the Reactor Coolant System (RCS) Alloy 600 piping penetrations were performed in accordance with the Calvert Cliffs In-Service Inspection Program. As a result of the inspections, two RCS nozzles were identified with indications of flaws requiring disposition. No through wall leakage was detected during the inspections. Both nozzles were determined to have a flaw or flaws that could not be found acceptable under American Society of Mechanical Engineers (ASME) Section XI, IWB-3600. The RCS nozzles requiring repair were the 21 Hot Leg Drain Line and 22A Cold Leg Letdown Line. Evaluation of the nozzles determined repairs were required prior to returning Unit 2 to service. Although the nozzles required repair, the structural integrity of the nozzles was not compromised prior to discovery and repair. Weld overlay repair techniques were employed to restore each nozzle to ASME Section XI compliance. Code relief was requested from the Nuclear Regulatory Commission (NRC) to allow final disposition of the resulting configuration. This relief request was verbally approved by NRC via teleconference on March 10, 2005, prior to the restart of Unit 2.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

I. DESCRIPTION OF EVENT

On February 24, 2005, with Unit 2 in Mode 5, ultrasonic (UT) inspections of the Reactor Coolant System (RCS) Alloy 600 piping penetrations were performed in accordance with the Calvert Cliffs In-Service Inspection (ISI) program. As a result of the UT inspections, two RCS nozzles were identified with indications of flaws requiring disposition. No through wall leakage was detected during the inspections. Both nozzles were determined to have a flaw or flaws that could not be found acceptable under American Society of Mechanical Engineers (ASME) Section XI, IWB-3600.

The RCS nozzles requiring repair were the two inch diameter 21 Hot Leg Drain Line and 22A Cold Leg Letdown Line. These are carbon steel nozzles buttered using Alloy 182/82 and a stainless steel safe-end was welded to the buttered nozzle using Alloy 182/82. The 21 Hot Leg Drain Line Nozzle UT identified one circumferential indication and two axial indications in the dissimilar weld regions that required further disposition. An engineering evaluation of this nozzle was completed on February 26, 2005, indicating the circumferential indication was acceptable under ASME Section XI standard, while the axial indications were not. The results of this evaluation indicated repair would be required prior to returning Unit 2 to service. The 22A Cold Leg Letdown Nozzle UT identified one axial indication that required disposition. Evaluation of this nozzle on February 27, 2005, determined that this indication could not be accurately sized in accordance with ASME Section XI requirements and repair was also required prior to returning Unit 2 to service. Although the nozzles required repair prior to restart, the indications did not represent an immediate threat to the structural integrity of the RCS. The condition posed no threat to operation and was not a failure of any structure, system, or component important to safety.

Eight-hour non-emergency Emergency Notification System notifications were made, in accordance with 10 CFR 50.72(b)(3)(ii), for each nozzle affected. A subsequent evaluation determined there is a reasonable expectation for continued operability for the Unit 1 Alloy 600 dissimilar metal welds. This evaluation credited the ongoing inspection program for dissimilar metal welds and the site's ISI Program, which ensures surface and/or volumetric examination of affected welds on a specified basis. By following industry recommendations, the boric acid inspection program, the risk informed ISI program, and the site Alloy 600 program, Calvert Cliffs Nuclear Power Plant addresses the short and long-term susceptibility of all RCS Alloy 600 components.

A weld overlay repair technique (using Alloy 52M which is not susceptible to primary water stress corrosion cracking) was employed to restore each nozzle to ASME Section XI compliance. Code relief was requested from the Nuclear Regulatory Commission (NRC) to allow final disposition of the resulting configuration. This relief request was verbally approved by the NRC via teleconference on March 10, 2005, prior to the restart of Unit 2.

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II. CAUSE OF EVENT

The root cause of the 21 Hot Leg Drain Nozzle (circumferential indication) was an original fabrication defect, with no evidence of having grown in service. This indication was determined to be acceptable under ASME Section XI standards. The two axial indications on the 21 Hot Leg Drain Nozzle were caused by primary water stress corrosion cracking.

The 22A Cold Leg Letdown Nozzle axial indication was not found to be a degraded condition, but was instead considered a very local ultrasonic anomaly. Repair was conservatively performed due to the inability to successfully size the anomaly within ASME Section XI Code requirements.

III. ANALYSIS OF EVENT

This event is reportable in accordance with the following:

10 CFR 50.73(a)(2)(ii)(A): "Any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers being seriously degraded."

NUREG-1022, Revision 2, Section 3.2.4, includes, as examples of seriously degraded conditions, welding defects in the primary coolant system that cannot be found acceptable under ASME Section XI standards. The subject axial indications were evaluated and found unacceptable under ASME Section XI, IWB-3600, "Analytical Evaluation of Flaws." Based on NUREG-1022, Revision 2, guidance, this represents a seriously degraded condition of the primary coolant system pressure boundary. Reporting under 10 CFR 50.73(a)(2)(ii)(A) is therefore required.

This condition had no actual safety consequences because no failures occurred and the structural integrity of the RCS pressure boundary was not compromised. The repairs to the nozzles were performed to ensure continued integrity through future operating cycles.

IV. CORRECTIVE ACTIONS

- A. The affected RCS nozzles were repaired with a weld overlay repair technique that met ASME Section XI requirements, as modified by an NRC approved code relief. Ultrasonic examinations were performed after repairs verifying compliance.
- B. Five additional UT examinations were performed, in accordance with ASME Section XI guidelines, upon discovery of flaw indications in the original sample of nozzles. No indications were identified.

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V. ADDITIONAL INFORMATION

A. Component Identification

Component	IEEE 803 EHS Function	IEEE 805 System ID
RCS Nozzle	NZL	AB

B. Previous Occurrences

No other previous similar events have occurred within the past three years.