Exelon Generation

Byron Generating Station

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United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Byron Station, Unit 1
Facility Operating License No. NPF-37
NRC Docket No. STN 50-454

Subject: Licensee Event Report (LER) 454-2015-005-00, "Byron Unit 1, Liquid Penetrant Indications in Embedded Flaw Seal Weld Repair of Control Rod Drive Mechanism Penetration 31 During Refueling Outage"

Enclosed is Byron Station Licensee Event Report (LER) No. 454-2015-005-00 regarding liquid penetration (PT) examinations performed on a previously repaired control rod drive mechanism that identified rejectable indications. This condition is reportable in accordance with 10 CFR 50.73(a)(2(ii)(A) for any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers being seriously degraded.

There are no regulatory commitments in this report.

Should you have any questions concerning this submittal, please contact Mr. Douglas Spitzer, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,

Mark E. Kanavos
Site Vice President
Byron Generating Station

MEK/GC/sg

Enclosure: LER 454-2015-005-00

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Byron Generating Station

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Byron Station, Unit 1	05000454	1 OF 3

4. TITLE

Liquid Penetrant Indications in Embedded Flaw Seal Weld Repair of Control Rod Drive Mechanism Penetration 31 During Refueling Outage

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
									N/A	N/A
09	18	2015	2015	005	00	11	17	2015	FACILITY NAME: N/A	DOCKET NUMBER: N/A

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
6	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☒ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
0	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Douglas Spitzer – Manager, Byron Regulatory Assurance	(815) 406-2800

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
B	AB	1718E72	Westinghouse	Y	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

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

On September 18, 2015 at 2000 hours, during the Byron Station fall 2015 Unit 1 refueling outage (B1R20), in-service liquid penetration (PT) examinations were performed on the previously repaired control rod drive mechanisms (CRDMs) at penetrations 31 and 43. During the examination of the repair for CRDM penetration 31, one 9/32 inch rounded indication and one 0.010 inch linear indication were documented, exceeding the acceptance criteria of dimensions greater than 3/16 inch for rounded indications and linear indications of any size. The linear indication was repaired with buffing only, while the rounded indication was repaired using both buffing and welding. There were no rejectable indications found on penetration 43. This LER is being submitted in follow-up to ENS 51410 made on September 18, 2015.

The cause of these flaws is attributed to existing weld discontinuities and minor subsurface voids opening to the surface or enlarging due to thermal and/or pressure stresses during plant operation.

This event is being reported under 10CFR50.73(a)(2)(ii)(A) for any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers being seriously degraded.

NARRATIVE

A. Plant Condition Prior to Event

Event Date/Time: September 18, 2015 / 2000 hours CST
Unit 1 - Mode 6 - Refuel Outage

Unit 1 Reactor Coolant System: [AB] - Ambient temperature and de-pressurized

No structures, systems or components were inoperable at the start of this event that contributed to the event.

B. Description of Event

On September 18, 2015 at 2000 hours, during the Byron Station fall 2015 Unit 1 refueling outage (B1R20), in-service liquid penetration (PT) examinations were performed on the previously repaired control rod drive mechanisms (CRDMs) at penetrations 31 and 43. During the examination of the repair for CRDM penetration 31, one 9/32 inch rounded indication and one 0.010 inch linear indication were documented that exceeded the acceptance criteria of dimensions greater than 3/16 inch for rounded indications and linear indications of any size. The linear indication was repaired with buffing only, while the rounded indication was repaired using both buffing and welding. There were no rejectable indications found on penetration 43. No other CRDM penetration repairs were required in B1R20. This LER is being submitted in follow-up to ENS 51410 made on September 18, 2015.

This was the fourth in-service examination of the embedded flaw seal welds on CRDMs 31 and 43 since they were applied in the Byron Unit 1, spring 2011 refueling outage (B1R17). Seal weld indications were identified using liquid penetrant examinations during B1R18 (September 2012) and they were repaired in accordance with ASME Code Case N729-1 prior to the unit being returned to service.

In addition to the PT examination of the embedded flaw weld repair on Penetration 31, all penetrations were examined by ultrasonic and eddy current methods using procedures and personnel qualified in accordance with the EPRI Performance Demonstration Program. The EPRI program is implemented by 10 CFR 50.55a, "Codes and standards," which includes the use of ASME Section XI Code Case N-729-1, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds Section XI, Division 1." No indications of Primary Water Stress Corrosion Cracking (PWSCC) or through wall leakage were observed on any of the remaining penetrations. A bare metal visual inspection of the exterior surfaces of the reactor head and penetrations was also performed during B1R20 in accordance with ASME Section XI Code Case N-729-1. There was no indication of through wall leakage observed during the bare metal visual examination.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(A), for any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded.

C. Cause of Event

Based on industry experience and previous Byron evaluations, the cause of this event was determined to be mechanical discontinuities/minor subsurface voids opening up to the weld surface due to thermal and/or pressure stresses during plant operation.

NARRATIVE

D. Safety Significance

This condition had no actual safety consequences impacting plant or public safety.

The flaw was identified in a timely manner and repaired prior to the repaired penetration being exposed to the RCS. The flaw was identified as part of a required periodic inspection.

Based on the B1R20 documented characteristics and dimensions of the observed PT indications, there was no Safety Significant Functional Failure (i.e., loss of safety function) as a result of these indications. The primary coolant pressure boundary was maintained and capable of preventing the release of radioactive material.

E. Corrective Actions

The linear indication was repaired with buffing only while the rounded indication was repaired using both buffing and welding. There no rejectable indications found on penetration 43. No other CRDM penetration repairs were required in B1R20.

F. Previous Occurrences

This condition is limited to penetrations repaired by the embedded flaw method at Byron Station.

Byron Station, Unit 1. Licensee Event Report 2012-004-00, "Reactor Pressure Vessel Head Control Rod Drive Mechanism Penetration Nozzle Weld Repair Surface Indications," November 12, 2012