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June 22, 2022

10CFR50.73

LTR: BYRON 2022-0040
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United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Byron Station, Unit 2
Renewed Facility Operating License No. NPF-66
NRC Docket No. STN 50-455

Subject: Licensee Event Report (LER) No. 455-2022-001-00 "Byron Station Unit 2 Volumetric Examinations of Reactor Pressure Vessel Head Core Exit Thermocouple Penetration P-75 Identified an Indication Attributed to Primary Water Stress Corrosion Cracking"

Enclosed is Byron Station Licensee Event Report (LER) No. 455-2022-001-00 regarding volumetric examinations of the Reactor Vessel Head Core Exit Thermocouple Penetration P-75 identified a recordable indication that did not meet the applicable acceptance criteria on Byron Unit 2. This condition is being submitted in accordance with 10 CFR 50.73, "Licensee Event Report System."

There are no regulatory commitments in this report.

Should you have any questions concerning this submittal, please contact Ms. Zoe Cox, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,

Harris Welt
Site Vice President
Byron Generating Station

HW/ZC/mf

Enclosure: LER 455-2022-001-00

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

NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk all: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)
(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Byron Station, Unit 2	05000455	1 OF 3

4. Title
Byron Station Unit 2 Volumetric Examinations of Reactor Pressure Vessel Head Core Exit Thermocouple Penetration P-75 Identified an Indication Attributed to Primary Water Stress Corrosion Cracking.

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
04	23	2022	2022	- 001 -	00	06	22	2022	N/A	N/A
									Facility Name: N/A	Docket Number: N/A

9. Operating Mode	10. Power Level
Mode 6	000

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☒ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ OTHER (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Zoe Cox, Regulatory Assurance Manager	(815) 406-2800

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS
B	AB	1718E72	W120	Y		N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☒ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

During the Byron Station, Unit 2, spring 2022, refueling outage, volumetric examinations of the Reactor Vessel Head Core Exit Thermocouple Penetration P-75 identified a recordable indication that did not meet the applicable acceptance criteria.

The cause of the P-75 unacceptable indication is attributed to Primary Water Stress Corrosion Cracking.

A flaw growth analysis determined the indication was acceptable for continued operation for two refueling cycles under ASME Code Case N-729-6 ASME Section XI requirements. The indication will be repaired within the next two refuel cycles.

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.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Byron Station, Unit 2	05000455	2022	- 001	- 00

NARRATIVE

A. Plant Operating Conditions Before the Event:

Event Date: April 23, 2022

Unit: 2 MODE: 6 (Refueling) Reactor Power: 000 percent

Unit 2 Reactor Coolant System (RCS) [AB]: Ambient Temperature and Depressurized

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

B. Description of Event:

At 08:53 on April 23, 2022, during the Byron Station, Unit 2, spring 2022 (B2R23) refueling outage, volumetric examinations of the Reactor Vessel Head Core Exit Thermocouple (CETC) Penetration P-75 identified a recordable indication that did not meet the applicable acceptance criteria. No additional indications were found, and the extent of condition was limited to Penetration 75.

During the prior Byron Station B2R19 and B2R20 refueling outages in spring 2016 and fall 2017, the Reactor Pressure Vessel Head Penetration Nozzles were mitigated from Primary Water Stress Corrosion Cracking (PWSCC) using the Ultra-High Pressure Cavitation Peening (UHPCP) process in accordance with the requirements of MRP-335, Revision 3-A. In response to a relief request submitted on August 30, 2018 (ADAMS Accession No. ML18248A060), requesting approval for alternative follow-up inspections of peening-applied reactor vessel head penetration nozzles in accordance with ASME Code Case N-729-4 for the fourth inservice inspection (ISI) interval of Byron Station, Unit 2, the Nuclear Regulatory Commission (NRC) authorized the proposed alternative on September 19, 2017 (ADAMS Accession No. ML19035A294). 10 CFR 50.55a, "Codes and standards," paragraph (g)(6)(ii)(D) has since been updated such that holders of operating licenses or combined licenses for pressurized-water reactor as of or after June 3, 2020, shall implement the requirements of ASME BPV Code Case N-729-6 instead of ASME BPV Code Case N-729-4, subject to the listed conditions, by no later than one year after June 3, 2020.

The indication at P-75 was found outside the required peening coverage area. Peening had not been performed on this area due to geometry limitations where the funnel fillet welds, and the adjacent areas are shadowed by top of the funnel. This indication is located at 184 degrees with a length of 0.197" with a depth of 0.141" from the outer diameter (OD) surface of the CETC penetration. The indication extends from 1.498" to 1.695" from the end of the nozzle. The indication is axially oriented and is at the location of one of the funnel fillet welds.

The indication is in the CETC penetration nozzle itself and not the weld associated with the anti-rotation weld for the funnel. Although this portion of the nozzle is not part of the pressure retaining boundary, it does fall within the jurisdiction of ASME Section XI and is Class 1 safety related. Byron Station completed an analysis to determine growth of the flaw in accordance with ASME Code Case N-729-6 and ASME Section XI, 2007 Edition through the 2008 Addenda. The analysis documents that the Unit 2 reactor vessel head remains operable for two fuel cycles (until the spring 2025 (B2R25) refueling outage).

This LER is being submitted in follow-up to ENS 55857 made on April 23, 2022, in accordance with 10 CFR 50.72(b)(3)(ii)(A).

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Byron Station, Unit 2	05000455	2022	- 001	- 00

NARRATIVE

C. Cause of Event

The cause of the P-75 unacceptable indication is attributed to PWSCC, based on the volumetric examination characterization of the indication.

D. Safety Consequences:

This condition had no actual safety consequences impacting plant or public safety. This event is not considered an event or condition that could have prevented fulfillment of a safety function.

The indication is in the CETC penetration nozzle itself and not the weld associated with the anti-rotation weld for the funnel. Although this portion of the nozzle is not part of the pressure retaining boundary, it does fall within the jurisdiction of ASME Section XI and is Class 1 safety related. Byron Station has completed an analysis to determine growth of the flaw in accordance with ASME Code Case N-729-6 and ASME Section XI, 2007 Edition through the 2008 Addenda. The analysis documents that the Unit 2 reactor vessel head remains operable for two fuel cycles (until B2R25). The remaining CETC penetrations have been analyzed and reviewed during the spring 2022 refueling outage (B2R22), and no other indications were found.

Based on the B2R23 documented characteristics and dimensions of the observed volumetric indications, there was no Safety Significant Functional Failure (i.e., loss of safety function) resulting from this indication. The primary coolant pressure boundary was maintained and capable of performing its design function.

E. Corrective Actions:

A flaw growth analysis determined the indication was acceptable for continued operation for two refueling cycles under ASME Code Case N-729-6 ASME Section XI requirements. The indication will be repaired within the next two refuel cycles.

Re-inspection of the CETC nozzle for the penetration 75 indication is required each refueling outage until the flaw is repaired, per MRP-335, Revision 3-A, Table 4-3.

A permanent repair to eliminate the indication will be performed within two fuel cycles, as tracked by the Corrective Action Program.

F. Previous Occurrences:

No previous, similar Licensee Event Reports were identified at the Byron Station in the past three years.

G. Component Failure Data:

Manufacturer	Nomenclature	Model	Mfg. Part Number
Westinghouse	Reactor Vessel Integrated Head Package Termination	1718E72	N/A