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RA-22-0609

December 21, 2022

10 CFR 50.73

Attn: Document Control Desk  
U. S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852-2746

Duke Energy Carolinas, LLC  
Oconee Nuclear Station Unit 1  
Docket Number: 50-269  
Renewed Operating Licenses: DPR-38

**Subject:** Licensee Event Report 269/2022-001, Revision 00 – Unit 1 Ultrasonic Examination  
Indications Identifies Degraded Reactor Coolant System Pressure Boundary

Licensee Event Report 269/2022-001, Revision 00, is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

There are no regulatory commitments associated with this LER.

There are no unresolved corrective actions necessary to restore compliance with NRC requirements.

If there are questions, or further information is needed, contact Sam Adams, Regulatory Affairs, at (864) 873-3348.

Sincerely,

A handwritten signature in black ink, appearing to read "Steven M. Snider", written in a cursive style.

Steven M. Snider  
Vice President  
Oconee Nuclear Station

Enclosure: Licensee Event Report 269/2022-001 Rev.00

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cc (w/Enclosure):

Ms. Laura Dudes, Administrator, Region II  
U.S. Nuclear Regulatory Commission  
Marquis One Tower  
245 Peachtree Center Ave., NE, Suite 1200  
Atlanta, GA 30303-1257

Mr. Shawn Williams, Project Manager  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Mail Stop O-08B1A  
Rockville, MD 20852-2738

Mr. Jared Nadel  
NRC Senior Resident Inspector  
Oconee Nuclear Station



**LICENSEE EVENT REPORT (LER)**

(See Page 2 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/nureqs/staff/sr1022/r3/>)

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 Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk ail: [oir\\_submission@omb.eop.gov](mailto:oir_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.

<b>1. Facility Name</b> Oconee Nuclear Station Unit 1	<b>2. Docket Number</b> 0500000269	<b>3. Page</b> 1 OF 4
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**4. Title**  
Ultrasonic Examination Indication Identifies Degraded Reactor Coolant System Pressure Boundary

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
11	01	2022	2022	001	00	12	21	2022	NA	05000
									Facility Name	Docket Number
									NA	05000

<b>9. Operating Mode</b> 6	<b>11. This Report is Submitted Pursuant to the Requirements of 10 CFR §:</b> (Check all that apply)				
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<b>10. Power Level</b> 000	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(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)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)	
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)	
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)	
	<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)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(iii)	
				<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)

**12. Licensee Contact for this LER**

Licensee Contact Samuel Adams, Oconee Regulatory Affairs	Telephone Number (Include Area Code) (864) 873-3348
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**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	PSP	X000	Y	N/A				

<b>14. Supplemental Report Expected</b> <input checked="" type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input type="checkbox"/> No	<b>15. Expected Submission Date</b> Month: 03, Day: 31, Year: 2025
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Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

At 1433 Eastern Daylight Time on 11/1/2022, during the Oconee Nuclear Station (ONS) Unit 1 refueling outage, it was determined that the results of a planned ultrasonic examination (UT) performed on a Reactor Coolant System (RCS) pressure boundary weld (specifically the 1B2 High Pressure Injection (HPI) pipe to safe end weld) did not meet applicable acceptance standards. The examination was scheduled and performed as part of the ONS Augmented In-Service Inspection (ISI) Program.

The cause of the indication is unknown at the time of this report.

Units 2 and 3 were not affected by this event.

This event was reported to the NRC on November 1, 2022, in Event Notification (EN) number 56197, as an 8-hour non-emergency notification under 10 CFR 50.72(b)(3)(ii)(A) – Degraded Condition. The event is also reportable under 10 CFR 50.73(a)(2)(ii)(A) as a degradation of a principal safety barrier.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Oconee Nuclear Station Unit 1	0500000269	2022	001	00

**NARRATIVE**

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

**BACKGROUND**

At the time that the indication on the 1B2 HPI Injection Line was identified, Unit 1 was in a refueling outage in Mode 6. No significant structures, systems or components were out of service at the time of this event that contributed to the event.

During normal operation, the HPI System [EIS:BG] controls the RCS [EIS:AB] inventory, provides the seal water for the Reactor Coolant Pumps (RCP) [EIS:P], and recirculates RCS letdown for water quality maintenance and reactor coolant boric acid concentration control. The discharge of the HPI pumps connects to a nozzle on each of the four reactor inlet pipes downstream of the RCPs. The reactor coolant which is letdown is normally returned to the RCS through two of these nozzles (1A1 and 1A2).

During emergency operation, the HPI system supplies borated water from the Borated Water Storage Tank (BWST) to the RCS and the RCP seals. Three parallel HPI pumps have the capability to take suction from the BWST and discharge through two redundant flow headers into the RCS, utilizing four injection lines (two per header). The stainless steel HPI injection lines terminate at injection nozzle [EIS:NZL] assemblies located on each of the reactor inlet pipes downstream of the RCPs. Each nozzle assembly consists of a carbon steel nozzle (stainless steel clad on the inside), to which a stainless-steel safe end is welded. The HPI piping is welded to the other end of the safe end. Inside the safe end is a stainless-steel thermal sleeve, which extends into the main RCS flow path.

**EVENT DESCRIPTION**

On 11/1/2022, Unit 1 was in a refueling outage in Mode 6 when a planned UT examination of component 1RC-201-121 (Pipe to Safe End Weld) was being performed, an ID connected, axially oriented indication was observed. The indication was located near the weld centerline and extended approximately 0.6 inches towards the safe end and 0.4 inches towards the piping side of the weld, for an overall length of approximately 1 inch. After initial detection, an additional team was sent out to further characterize the indication. The indication was confirmed and sizing techniques determined that the indication measured to be approximately 0.200 inches thru-wall height. When applying the flaw evaluation criteria of IWB-3514-2 in ASME Section XI 2007, 2008 Addendum, the resulting a/t % was determined to be greater than 50% which exceeded the allowable a/t % thereby preventing the flaw from being evaluated as acceptable for continued use.

Given the inability for continued use with the flaw present, the decision was made to install a weld overlay over the indication, in accordance with ASME Section XI Appendix Q, under the Engineering Change (EC) process, to allow operation for up to one cycle. The initial EC was completed to install the weld overlay and allow for startup and 90 days of operation of the plant with the weld overlay installed. That EC will be revised to allow operation for the entire cycle with the weld overlay installed. Additionally, thermocouples were installed on the 1B1 and 1B2 HPI nozzles, to support cause determination, as they are both emergency injection nozzles with similar baseline conditions. The thermocouple data will continue to be monitored during the remaining cycle.

Units 2 and 3 were not affected by this event.

Reportability

This event was reported to the NRC on November 1, 2022, in Event Notification (EN) number 56197, as an 8-hour non-emergency notification under 10 CFR 50.72(b)(3)(ii)(A) – Degraded Condition. The event is also reportable under 10 CFR 50.73(a)(2)(ii)(A) as a degradation of a principal safety barrier.



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**CAUSAL FACTORS**

An Investigation Team was assembled and a fault matrix was assembled to systematically identify and support or refute any potential causes. However, a definitive cause cannot be determined until the indication can be cut out for metallurgical analysis and evaluation. This will not happen until the next Unit 1 refueling outage in the Fall of 2024. A supplemental report will be provided when the cause is determined.

**CORRECTIVE ACTIONS**

Immediate:

1. Implemented Temporary EC to install weld-overlay and allow operation for 90 days.
2. Thermocouples were installed on the 1B1 and 1B2 HPI nozzles for temperature monitoring to support cause determination.

Planned:

1. Revise EC to allow operation for a full cycle with the weld overlay installed.
2. Continue to monitor data from the installed thermocouples for the duration of the cycle.
3. Cut out the indication during the next Unit 1 refueling outage and send it to the Metallurgy Lab for testing
4. Review the Metallurgy test results and take follow-on actions as appropriate.

**SAFETY ANALYSIS**

This condition had no effect on the health and safety of the public. The indication discovered on the 1B2 pipe to safe-end weld was identified and addressed (via the weld overlay) in a timely manner. The indication was identified as part of a required periodic inspection and did not penetrate through the weld. The frequency of the required inspections would ensure degradation was detected before it reached any level of significance. There were no actual safety consequences for the event. This event is not considered an event or condition that could have prevented fulfillment of a safety function.

**ADDITIONAL INFORMATION**

A review of Duke Energy's Corrective Action Program identified 1 related Oconee LER since 2013 that involved similar underlying concerns or reasons as this event.

A thru-wall leak occurred at this weld location in November 2013 (ONS LER 2013-004-01, ML15055A597). The circumferential flaw that eventually propagated thru-wall was caused by mechanical high cycle fatigue loading. Inadequate oversight of the augmented examination program was also found causal, leading to incomplete examination of this weld. The previous ultrasonic examinations performed on this weld failed to identify the existing flaw, which allowed it to continue growing until the thru-wall leak developed. As a result, weld inspection frequency was increased to every refueling outage. Improvements to NDE procedures were also made to increase weld coverage and oversight.



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		2022	001	00

These changes were effective in identifying the current axial weld indication prior to it growing thru-wall. Past indications in this and similar HPI nozzle welds have been circumferential. The axial nature of the current flaw suggests a different loading mechanism. Therefore, this is not a recurring event.

This event is considered INPO IRIS Reportable. There were no releases of radioactive materials, radiation exposures or personnel injuries associated with this event.