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RA-22-0333

10 CFR 50.73

December 6, 2022

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Energy Carolinas, LLC
Catawba Nuclear Station, Unit 2
Docket No. 50-414
Licensee Event Report (LER) 414/2022-002-00

Pursuant to 10 CFR 50.73(a)(1) and (d), attached is LER 414/2022-002-00, entitled "Indications Identified During Reactor Vessel Head Penetration Embedded Flaw Repair Surface Examination." This report is being submitted in accordance with 10 CFR 50.73(a)(2)(ii)(A).

There are no regulatory commitments contained in this letter or its attachment.

This event is considered to be of no significance with respect to the health and safety of the public.

If questions arise regarding this LER, please contact Sherry E. Andrews of Regulatory Affairs at (803) 701-3424.

Sincerely,

Tom Simril
Vice President, Catawba Nuclear Station

Attachment

xc (with attachment):

L. Dudes
Regional Administrator
U.S. Nuclear Regulatory Commission - Region II
Marquis One Tower
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David Rivard
NRC Senior Resident Inspector
Catawba Nuclear Station

NRC FORM 366 (08-2020) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 | EXPIRES: 08/31/2023

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 https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name	2. Docket Number	3. Page
Catawba Nuclear Station, Unit 2	05000414	1 OF 3

4. Title

Indications Identified During Reactor Vessel Head Penetration Embedded Flaw Repair Surface Examination

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
										05000
10	15	2022	2022	- 002 -	00	12	06	2022	Facility Name	Docket Number
										05000

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 in NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include Area Code)
Sherry Andrews, Senior Nuclear Engineer	803-701-3424

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	RPV	C490	Y					

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)

On October 15, 2022, during the Catawba Nuclear Station Unit 2 refueling outage, it was determined that the results of a planned surface examination Liquid Penetrant test (PT) performed on a previous weld overlay repair on nozzle penetration 74 of the reactor vessel closure head (RVCH) did not meet applicable acceptance standards. The examination was being performed to meet the requirements of Relief Request RA-21-0144, 'Proposed Alternative to Use Reactor Vessel Head Penetration Embedded Flaw Repair for Life of Plant.' The penetration required repairs for the discovered indications. The repairs were completed in accordance with the ASME Code of Record prior to returning the RVCH to service.

Based on industry experience, the cause of this event is attributed to mechanical discontinuities/minor subsurface voids which were exposed to the weld surface due to thermal and/or pressure stresses during plant operation.

This report is being submitted in accordance with 10 CFR 50.72(a)(2)(ii)(A), "any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded."

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Catawba Nuclear Station, Unit 2	05000-414	2022	- 002	- 00

NARRATIVE

The following information is provided to assist readers in understanding the event described in this LER. Applicable Energy Industry Identification [EIIS] system and component codes are enclosed within brackets. Catawba Nuclear Station unique system and component identifiers are contained within parentheses.

BACKGROUND

On October 15, 2022, Unit 2 of Catawba Nuclear Station was in a scheduled refueling outage (Mode 6, 0% power) for cycle 25 (C2R25). During the outage, a liquid penetrant (PT) surface examination was performed on the embedded flaw repair of nozzle [NZL] penetration 74 of the reactor vessel closure head (RVCH) [RPV] in accordance with the requirements of Catawba relief request RA-21-0144 (ML22020A283). The RVCH is a Westinghouse Design manufactured by Combustion Engineering.

No Structures, Systems, or Components (SSCs) were inoperable at the start of this event that contributed to the event. No change in plant mode or in reactor power occurred as a result of this event.

EVENT DESCRIPTION

During the Catawba Unit 2 spring 2021 refueling outage (C2R24), an indication was discovered in the J-groove weld of RVCH nozzle penetration 74 which required repair. Catawba used the embedded flaw repair process, in accordance with the NRC approved WCAP-15987-P-A report, and Duke Energy relief request dated April 24, 2021 (RA-21-0145) to repair the weld. The embedded flaw repair process involves depositing weld material, which is Primary Water Stress Corrosion Cracking (PWSCC) resistant, over the entire surface of the J-groove weld on the penetration nozzle of interest, as well as over the outside surface of the nozzle tube. On April 24, 2021 (ML21117A129), the NRC provided verbal authorization for the licensee's proposed alternative repair for one cycle of operation and by letter dated September 20, 2021 (ML21253A082), the NRC provided its follow-up safety evaluation for the verbal relief request. By letter dated January 20, 2022 (RA-21-0144), as supplemented by letter dated July 7, 2022, Catawba provided additional technical basis to support the continued use of the repair. Catawba made this request in accordance with 10 CFR 50.55a(z)(1) on the basis that the proposed alternative repair will provide an acceptable level of quality and safety. On August 31, 2022, Catawba was notified that the NRC staff had determined that the proposed alternative provided an acceptable level of quality and safety and authorized the use of the proposed alternative in RA-21-0144 through the remainder of the current fourth 10-year inservice inspection interval.

During the Catawba Unit 2 fall 2022 refueling outage (C2R25), a PT surface examination was performed on the embedded flaw repair of nozzle penetration 74 of the RVCH in accordance with the requirements of Catawba relief request RA-21-0144. On October 15, 2022, the examination identified indications which did not meet the applicable acceptance standards from ASME Section III, NB- 5350 and were therefore deemed rejectable. The indications were removed by buffing/grinding, localized weld build-up applied to restore the embedded flaw repair thickness, and a final PT of the locations was performed to ensure acceptance standards were met in the as-left condition. The as-left condition has met the applicable acceptance standards and no additional field work is required.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(A), "Any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded" because the discovered indications did not meet the acceptance standards from ASME Section III, NB- 5350 and were therefore deemed rejectable, in accordance with the Catawba relief request RA-21-0144.

CAUSAL FACTORS

Based on industry experience, the cause of this event is attributed to mechanical discontinuities/minor subsurface voids getting exposed to the weld surface due to thermal and/or pressure stresses during plant operation.

CORRECTIVE ACTIONS

To correct the condition, the indications were removed by buffing/grinding, and localized weld build-up was applied to restore the embedded flaw repair thickness. A final PT of the location was performed to ensure acceptance standards were met in the as-left condition. The as-left condition met the applicable acceptance standards, and no additional field work is required.

SAFETY ANALYSIS

This condition had no effect on the health and safety of the public. The indications discovered on RVCH nozzle penetration 74 were identified in a timely manner and repaired. The indications were identified as part of a required periodic inspection and did not penetrate through the embedded flaw repair weld. The frequency of the required inspections would ensure degradation was detected before it reached any level of significance. All of the RVCH head penetrations were volumetrically inspected during C2R25, and no other rejectable indications were identified. 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 previous Licensee Event Report was submitted in June 2021 at Catawba Nuclear Station for Unit 2 for a discovered indication on RVCH nozzle penetration 74 caused by PWSCC. A previous Licensee Event Report was submitted in July 2020 for Unit 1 RVCH nozzle 18 for an indication that was attributed to a localized weld fabrication anomaly (not PWSCC).