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10 CFR 50.73

RBG-48140

December 16, 2021

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Licensee Event Report 50-458 / 2021-05-00, "Potential Loss of Safety Function due to Inoperable Reactor Core Isolation Cooling Steam Flow Transmitter"

River Bend Station – Unit 1
NRC Docket No. 50-458
Renewed Facility Operating License No. NPF-47

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report. This document contains no commitments. If you have any questions, please contact Mr. Tim Schenk at 225-381-4177.

Respectfully,

KCS/twf

Enclosure: Licensee Event Report 50-458 / 2021-05-00, "Potential Loss of Safety Function due to Inoperable Reactor Core Isolation Cooling Steam Flow Transmitter"

cc: NRC Regional Administrator - Region IV
NRC Project Manager - River Bend Station
NRC Senior Resident Inspector - River Bend Station
Louisiana Department of Environmental Quality
Public Utility Commission of Texas

Enclosure

RBG-48140

Licensee Event Report 50-458 / 2021-05-00, "Potential Loss of Safety Function due to Inoperable Reactor Core Isolation Cooling Steam Flow Transmitter"

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

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/)

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

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1. Facility Name	2. Docket Number	3. Page
River Bend Station – Unit 1	05000 458	1 OF 3

4. Title

Potential Loss of Safety Function due to Inoperable Reactor Core Isolation Cooling Steam Flow Transmitter

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
10	19	2021	2021	005	00	12	16	2021	NA	05000 NA
									Facility Name: NA	Docket Number: 05000 NA

9. Operating Mode	10. Power Level
1	100%

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)
Tim Schenk, Manager – Regulatory Assurance	225-381-4177

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
X	JM	PDT	R369	Y	NA	NA	NA	NA	NA

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

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

On October 19, 2021 at 13:40 Central Time (CT) with the unit in Mode 1 at 100% power, wire insulation inside one of the Reactor Core Isolation Cooling (RCIC) Steam Flow Transmitters was found in a degraded condition. The degraded wire insulation could have caused a fault which would have prevented one of the redundant RCIC steam supply line isolations from occurring.

The issue was determined to be reportable in accordance with 10 CFR 50.73(a)(2)(v)(C) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material and 10 CFR 50.73(a)(2)(i)(B) as an operation prohibited by Technical Specifications.

The degraded wire insulation was corrected on October 21, 2021 at 08:38 CT by repair with qualified material. The most probable cause of the wire insulation degradation is moisture intrusion.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
River Bend Station – Unit 1	05000- 458	2021	- 005	- 00

NARRATIVE

EVENT DESCRIPTION

Surveillance test STP-207-4249 performs a channel calibration of the Reactor Core Isolation Cooling (RCIC) [BN] Steam Flow Transmitter [PDT] E31-PDTN084B as required by Technical Specification Surveillance Requirement 3.3.6.1.5-3.i. This Surveillance Test is performed on a 2-year frequency with the last completion documented on 04/21/2019.

On 10/19/2021 transmitter E31-PDTN084B was calibrated, and its performance was determined to be satisfactory by the performance of STP-207-4249. During the performance of the Surveillance Test, Maintenance Technicians identified insulation falling off of the negative wire terminated in the transmitter. The insulation on the positive wire was intact; however, it was discolored. These wires are terminated inside the transmitter and routed through a conduit seal mounted on the transmitter.

This condition could have prevented fulfilment of one of the RCIC steam supply high flow isolation functions. The specified safety function of the transmitter is to detect a break in the common RCIC / Residual Heat Removal (RHR) steam supply line and initiate inboard isolation valve closure. The transmitter provides a 4-20 mA signal to its associated trip unit. The isolation occurs on high steam flow. The degraded insulation did not affect the 4-20 mA signal; however, the transmitter was considered inoperable based on the potential for the bare wire to contact the transmitter housing (ground) during a seismic event. This could result in the signal failing downscale which would prevent the detection of a line break.

A gross failure alarm is received if the signal from the transmitter fails downscale. There were no documented gross failures of E31-PDTN084B over the past three years. There is no work history listed against the transmitter over the past three years other than the surveillance test STP-207-4249 performed on 04/21/2019. Therefore, the only opportunity to observe the wire insulation over the past three years was during the field portion of STP-207-4249 performed on 04/21/2019. STP-207-4249 was satisfactorily completed on 04/21/2019 without any documented degradation of the wiring insulation.

The redundant isolation function, as triggered from RCIC Steam Flow Transmitter E31-PDTN084A, was rendered inoperable for planned surveillance testing on 09/1/2020 from 13:20 to 15:00 CT and again from 15:20 to 16:25 CT. Therefore, this condition could have prevented fulfillment of the safety function for the for the duration of the time the redundant isolation function was rendered inoperable for testing on 09/1/2020. This issue is reportable in accordance with 10 CFR 50.73(a)(2)(v)(C) as any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material.

The degraded wiring insulation on the negative wire was corrected with qualified material on 10/21/2021 08:38 CT.

After the time of discovery, one of the RCIC steam supply high flow isolation functions was determined to be inoperable for 43 hours. The Technical Specifications allow 37 hours of operation in this condition. Therefore, this condition is also reported as an operation prohibited by Technical Specifications in accordance with 10 CFR 50.73(a)(2)(i)(B).

Although this event could have prevented the fulfillment of a safety function, engineering analysis has shown that this condition did not actually prevent fulfillment of a safety function. Therefore, this event is not reportable as a Safety System Functional Failure (SSFF) under the Regulator Assessment Performance Indicator Guideline, NEI 99-02.

SAFETY ASSESSMENT

The actual consequence of this event was the potential inability to isolate supply steam to the RCIC system with a high steam flow indication on one channel and a concurrent failure of the redundant isolation system.

In this case, the essential safety actions are carried out by equipment of sufficient redundancy so that no single failure of active components can prevent the required actions. The assumption is that the nonaffected channel would perform its safety function during a Design Basis Accident concurrent with a RCIC System Steam Supply Line break. The plant response to this event is bounded by the Updated Safety Analysis Report analysis of a RCIC System Steam Supply Line break concurrent with a Design Basis Accident.

There were no actual Nuclear or Radiological safety consequences due to this event. Thus, this event was of minimal significance to the health and safety of the public.

EVENT CAUSE

The wire insulation degradation was most likely caused by moisture intrusion.

CORRECTIVE ACTIONS

Complete:
The degraded wire insulation condition was corrected with qualified material.

Planned Actions Tracked in Corrective Action Program:
Validate torque on transmitter conduit bolt.
Replace transmitter E31-PDTN084B.
Perform Internal Inspection of E31-PDTN084B and document results.
Update Surveillance Test Procedure to include a visual inspection of internal wiring insulation for E31-PDTN084B and all EQAR qualified transmitters during channel calibration.

PREVIOUS SIMILAR EVENTS

None