TENNESSEE VALLEY AUTHORITY

Post Office Box 2000, Decatur, Alabama 35609-2000

July 14, 2025

10 CFR 50.73

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

Browns Ferry Nuclear Plant, Unit 2
Renewed Facility Operating License No. DPR-52
NRC Docket No. 50-260

Subject: **Licensee Event Report 50-260/2025-002-00**

The enclosed Licensee Event Report provides details of the inoperability of the BFN Unit 2 Residual Heat Removal Suppression Pool Spray system for a period of time exceeding three years. The Tennessee Valley Authority is submitting this report in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by the plant's Technical Specifications, and 10 CFR 50.73(a)(2)(v)(D), as any event or condition which could have prevented the fulfillment of the safety function of a system that is needed to mitigate the consequences of an accident.

There are no new regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact David J. Renn, Nuclear Site Compliance Manager, at (256) 729-2636.

Respectfully,

Daniel A. Komm
Site Vice President

Enclosure: Licensee Event Report 50-260/2025-002-00 – Residual Heat Removal Suppression Pool Spray Inoperable due to Missing U-bolt.

cc (w/ Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant
NRC Project Manager - Browns Ferry Nuclear Plant

ENCLOSURE

Browns Ferry Nuclear Plant
Unit 2

Licensee Event Report 50-260/2025-002-00

Residual Heat Removal Suppression Pool Spray Inoperable due to Missing U-bolt.

See Enclosed

NRC FORM 366 (04-02-2024) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 | EXPIRES: 04/30/2027

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/nuregs/staff/sr1022/r3/)

1. Facility Name		52. Docket Number	3. Page
Browns Ferry Nuclear Plant (BFN), Unit 2	☒ 050 ☐ 052	00260	1 OF 6

4. Title

Residual Heat Removal Suppression Pool Spray Inoperable Due to Missing U-bolt

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
05	16	2025	2025	- 002 -	00	07	14	2025	N/A	05000XXX
									Facility Name	Docket Number
									N/A	05000XXX

9. Operating Mode	10. Power Level
5	0

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)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.21(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☒ 50.73(a)(2)(i)(B)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

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

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Baruch Calkin, Compliance Engineer	256-278-1031

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
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On March 20, 2025, at 0901 CDT, it was discovered that support 2-H-343 was missing a u-bolt, resulting in a lack of load on the support. This condition could have prevented the Unit 2 Residual Heat Removal (RHR) Loop I Suppression Pool Spray (SPS) valve from opening or closing, and resulted in the inoperability of the Unit 2 RHR Loop I SPS. On May 16, 2025, a Past Operability Evaluation determined that this condition had most likely existed for at least three years prior to discovery.

The most likely cause of the event was a human performance error that was committed while performing maintenance on the Loop I SPS valve 2-FCV-074-0058 or its motor operator 2-MVOP-074-0058. Corrective actions for this event include re-installation of the missing u-bolt, and performance of a Notice of Indication evaluation on the support.

1. FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
	☒ 050		YEAR	SEQUENTIAL NUMBER	REV NO.
Browns Ferry Nuclear Plant, Unit 2	☐ 052	00260	2025	- 002	- 00

NARRATIVE

I. Plant Operating Conditions before the Event

At the time of discovery, BFN Unit 2 was in Mode 5 at approximately 0 percent power.

II. Description of Event

A. Event Summary

On March 20, 2025, it was discovered that support 2-H-343 [SNB] was missing a u-bolt, resulting in a lack of load on the support. This condition could have prevented the Unit 2 Residual Heat Removal (RHR)[BO] system Loop I Suppression Pool Spray (SPS)[BT] valve [FCV] from opening or closing, and resulted in the inoperability of the Unit 2 RHR Loop I SPS. On May 16, 2025, a Past Operability Evaluation (POE) determined that this condition had most likely existed for at least three years prior to discovery.

The Tennessee Valley Authority is submitting this report in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 50.73(a)(2)(i)(B), as a condition that was prohibited by the plant's Technical Specifications (TS), and 10 CFR 50.73(a)(2)(v)(D), as any event or condition which could have prevented the fulfillment of the safety function of a system that is needed to mitigate the consequences of an accident.

B. Status of structures, components, or systems (SSCs) that were inoperable at the start of the event and that contributed to the event

There were no SSCs whose inoperability contributed to this event.

C. Dates and approximate times of occurrences

DATE AND APPROXIMATE TIMES	OCCURRENCE
March 20, 2025	Missing u-bolt discovered by Inservice Inspection (ISI) examiner.
March 24, 2025 1655 CDT	Work complete to install missing u-bolt under Work Order (WO) 125207651.
May 16, 2025	A POE determined that the Unit 2 RHR Loop I SPS had been inoperable for longer than its TS allowed outage time.

NARRATIVE

D. Manufacturer and model number of each component that failed during the event

No components failed during this event.

E. Other systems or secondary functions affected

No other systems or secondary functions were affected.

F. Method of discovery of each component or system failure or procedural error

During an ISI VT-3 examination of Support 2-H-343-IE, the examiner identified that the support was missing a u-bolt.

G. The failure mode, mechanism, and effect of each failed component

No components failed during this event.

H. Operator actions

There were no operator actions associated with this event.

I. Automatically and manually initiated safety system responses

There were no automatic or manual safety system responses associated with this event.

III. Cause of the event

The direct cause of the event was a u-bolt that was missing from Support 2-H-343-IE.

A. Cause of each component or system failure or personnel error

The most likely cause of the event was a human performance error that was committed on March 24, 2019, while performing maintenance on the Loop I SPS valve 2-FCV-074-0058 or its motor operator [MO] 2-MVOP-074-0058. Both scopes of work would have required removal of the u-bolt from the associated support to enable performance of maintenance.

NARRATIVE

B. Cause(s) and circumstances for each human performance related root cause

A review of work orders determined that both site maintenance personnel and vendors had work orders to remove the u-bolt. However, an in-depth review of WOs 118592493 and 119860080 determined that the configuration control forms were not filled out documenting the removal and reinstallation of the u-bolt.

IV. Analysis of the event

The safety function of the RHR SPS is to mitigate potential bypass leakage paths and maintain the primary containment peak pressure below the design limits in the event of a design basis accident. The three-year period where the Unit 2 RHR Loop I SPS was considered inoperable included several windows where the Unit 2 RHR Loop II SPS was concurrently inoperable. During this time, the SPS would have been incapable of performing its safety function to maintain the primary containment peak pressure below the design limits.

BFN, Unit 2 TS Limiting Condition for Operation (LCO) 3.6.2.4, RHR Suppression Pool Spray, requires that four RHR SPS subsystems shall be operable. TS LCO 3.6.2.4 Condition B requires, with two RHR SPS subsystems inoperable, that one RHR SPS subsystem be restored to OPERABLE status within seven days or in accordance with the Risk Informed Completion Time (RICT) Program, albeit the RICT Program was not implemented at BFN until May 2, 2023. A POE determined that this condition is likely to have existed prior to March 2022, which exceeded the 3.6.2.4.B.1 required completion time.

Additionally, TS LCO 3.8.1 Condition B requires, with one required Unit 1 and 2 Diesel Generator (DG)[DG] inoperable, that required feature(s) supported by the inoperable Unit 1 and 2 DG be declared inoperable when the redundant required feature(s) are inoperable. Therefore, the RHR B or D suppression pool spray loops would have been required by TS 3.8.1 to be declared inoperable any time the C or D DGs were inoperable for greater than 4 hours, which occurred on multiple occasions between March 2022 and the time of this event.

Finally, TS LCO 3.0.4 states that when an LCO is not met, entry into a Mode or other specified condition in the Applicability shall only be made when the associated actions to be entered permit continued operation in the Mode or other specified condition in the Applicability for an unlimited period of time. On March 21, 2023, BFN, Unit 2 entered a TS 3.6.2.4 Applicable Mode when TS 3.6.2.4 Required Actions were not met.

NARRATIVE

V. Assessment of Safety Consequences

The Unit 2 RHR Loop I SPS valve is normally closed. Lack of an installed u-bolt could result in the inability to open or close the valve. The valve disc could potentially have been in any position (open/mid position/closed). The desired position in the Probabilistic Risk Analysis (PRA) model is for this valve to remain closed to prevent a possible flow diversion during core cooling operations, where it could slowly deplete the Reactor Pressure Vessel inventory. However, the Loop I SPS isolation valve [ISV] 2-FCV-074-0057 is also a normally closed valve in the same flow path of the possible flow diversion. This event did not impact 2-FCV-074-0057. According to TVA Calculation NDN-000-074-2007-0025 R6, “Flow diversions due to multiple valve failures are generally considered too low of a probability to be considered (in the PRA model).” The increase in core damage frequency or large early release frequency due to this potential flow diversion is considered negligible.

This valve is also required to open for the SPS function, but the SPS flowrate is only 5 percent of the drywell spray flowrate and is considered too small to be used for containment pressure control during a core-damage event. Therefore, SPS is not credited for any sequence in the PRA model. Based on the above, TVA has concluded that sufficient systems were available to provide the required safety functions needed to protect the health and safety of the public.

A. Availability of systems or components that could have performed the same function as the components and systems that failed during the event

The three-year period where the Unit 2 RHR Loop I SPS was considered inoperable included several windows where the Unit 2 RHR Loop II SPS was concurrently inoperable.

B. For events that occurred when the reactor was shut down, availability of systems or components needed to shutdown the reactor and maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident

This event did not affect the operability of any other Unit 2 RHR subsystem. During the event, the RHR system was available to remove residual heat while the reactor was shut down.

NARRATIVE

C. For failure that rendered a train of a safety system inoperable, estimate of the elapsed time from discovery of the failure until the train was returned to service

The Unit 2 RHR Loop I SPS was found to be inoperable on March 20, 2025. It was returned to service approximately four days later on March 24, 2025.

VI. Corrective Actions

Corrective Actions are being managed by the TVA's Corrective Action Program (CAP) under Condition Report 2000493.

A. Immediate Corrective Actions

The u-bolt was replaced on support 2-H-343.

B. Corrective Actions to Prevent Recurrence or to reduce the probability of similar events occurring in the future

The corrective action for this event was to conduct a Notice of Indication evaluation of the support.

As an additional action, maintenance personnel will be provided a brief on the proper use of configuration control forms.

VII. Previous Similar Events at the Same Site

A review of the BFN CAP and Licensee Event Reports (LERs) for Units 1, 2, and 3 revealed no other instances within the past three years of SPS inoperability due to missing components.

VIII. Additional Information

There is no additional information.

IX. Commitments

There are no new commitments.