



Post Office Box 2000, Decatur, Alabama 35609-2000

August 25, 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 50-260/2025-004-00 – Main Steam Relief Valves Lift Settings Outside of Technical Specifications Required Setpoints**

The enclosed Licensee Event Report provides the details of Main Steam Relief Valves which failed to meet their Surveillance Requirements for longer than allowed by plant Technical Specifications. The Tennessee Valley Authority is submitting this report in accordance with Title 10 of the Code of Federal Regulations 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by the plant's Technical Specifications.

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

Respectfully,

A handwritten signature in black ink, appearing to read 'D. A. Komm', with a checkmark at the end.

Daniel A. Komm
Site Vice President

Enclosure: Licensee Event Report 50-260/2025-004-00 – Main Steam Relief Valves Lift Settings Outside of Technical Specifications Required Setpoints

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 50-260/2025-004-00

**Main Steam Relief Valves Lift Settings Outside
of Technical Specifications Required Setpoints**

See Enclosed



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/>)

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 ail: 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.

1. Facility Name Browns Ferry Nuclear Plant (BFN), Unit 2	<input checked="" type="checkbox"/> 050 <input type="checkbox"/> 052	2. Docket Number 00260	3. Page 1 OF 6
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4. Title
Main Steam Relief Valves Lift Settings Outside of Technical Specifications Required Setpoints

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
06	25	2025	2025	004	00	08	25	2025	N/A	005000 N/A
									Facility Name	Docket Number
									N/A	050000 N/A

9. Operating Mode 1	10. Power Level 100
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.1200(a)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 73.1200(b)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	<input type="checkbox"/> 73.1200(c)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.1200(d)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73	<input type="checkbox"/> 73.1200(e)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.77(a)(1)	<input type="checkbox"/> 73.1200(f)
<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(2)(i)	<input type="checkbox"/> 73.1200(g)
<input type="checkbox"/> 20.2203(a)(2)(iv)		<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)	<input type="checkbox"/> 73.1200(h)
<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)		

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

12. Licensee Contact for this LER

Licensee Contact M. W. Oliver, Sr. Nuclear Licensing Program Manager	Phone Number (Include area code) 256-729-7874
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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	SB	RV	T020	N	N/A	N/A	N/A	N/A	N/A

4. Supplemental Report Expected) <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	15. Expected Submission Date	Month N/A	Day N/A	Year N/A
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16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On June 25, 2025, the Tennessee Valley Authority (TVA) was notified of as-found test results that four Main Steam Relief Valves (MSRVs) from Browns Ferry Nuclear Pant (BFN), Unit 2, were outside of their Surveillance Requirement limits for an indeterminate amount of time. These affected valves remained capable of maintaining reactor pressure within the American Society of Mechanical Engineers code limits and could perform their safety function.

It was determined that four MSRVs failed above their setpoints due to corrosion bonding to the valve seats. One of these four had been declared inoperable during the fuel cycle due to simmering and gross leakage. All thirteen of the MSRV pilot valves were replaced during the Unit 2 Spring 2025 refueling outage (2R23).



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

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1. FACILITY NAME Browns Ferry Nuclear Plant, Unit 2	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 00260	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR	SEQUENTIAL NUMBER	REV NO.
			2025	- 004	- 00

NARRATIVE

I. Plant Operating Conditions before the Event

At the time of discovery, Browns Ferry Nuclear Plant (BFN) Unit 2 was in Mode 1 at approximately 100 percent power.

II. Description of Event

A. Event Summary

On June 25, 2025, NTS/Element notified the Tennessee Valley Authority (TVA) with the as-found test results of the thirteen Main Steam Relief Valves (MSRVs) [RV], which were removed during the Spring 2025 Unit 2 Refueling Outage 23 (2R23). Four MSRVs (2-PCV-001-0023, 2-PCV-001-0031, 2-PCV-001-0041, and 2-PCV-001-0179) had as-found lift settings which were outside of the +/- 3 percent band of their setpoints required by Technical Specification (TS) 3.4.3, Safety/Relief Valves (S/RVs), for an indeterminate amount of time.

Throughout this event, the two-stage MSRV pilot valves remained capable of maintaining reactor pressure below 1375 pounds per square inch gauge (psig), which is the American Society of Mechanical Engineers (ASME) code limit of 110 percent of the vessel design pressure. The valves remained capable of performing their required safety function.

TVA is submitting this report in accordance with Title 10 of the Code of Federal Regulations 50.73(a)(2)(i)(B), as any operation or condition which was prohibited by the plant's TS.

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

There were no structures, systems, or components (SSCs) whose inoperability contributed to this event.



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NARRATIVE

C. Dates and approximate times of occurrences

Dates and Approximate Times	Occurrence
March 21, 2023	Unit 2 entered Mode 2, beginning Fuel Cycle 2C23.
January 15, 2025	Unit 2 MSR/V 2-PCV-001-041 was declared inoperable due to simmering and gross leakage.
March 5, 2025	Unit 2 entered Mode 4, beginning Refueling Outage 2R23.
June 25, 2025	NTS notified TVA with as-found test results of the thirteen Unit 2 MSR/V pilot valves removed during 2R23.

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

The failed components were all Target Rock Corporation two-stage pressure control valves, model number 7567F.

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

The MSR/V failures were discovered at NTS/Element during as-found testing of the thirteen MSR/V two-stage pilot valves which were removed during 2R23.

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

MSR/Vs 2-PCV-001-0023, 2-PCV-001-0031, 2-PCV-001-0041, and 2-PCV-001-0179 failed above their setpoints due to corrosion bonding to the valve seat. During the fuel cycle, MSR/V 2-PCV-001-0041 had been declared TS inoperable due to simmering and gross leakage.

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.



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III. Cause of the event

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

MSRVs 2-PCV-001-0023, 2-PCV-001-0031, 2-PCV-001-0041, and 2-PCV-001-0179 failed above their setpoints due to corrosion bonding to the valve seat. MSRV 2-PCV-001-0041 had been declared TS inoperable during the fuel cycle due to simmering and gross leakage. As a result of corrosion bonding, the force required to break the crystal structure of the corrosion bond alters the mechanical setpoint of the pilot valve. This issue is commonly known to the industry as setpoint drift. Simmering valves result in mechanical setpoint drift and is generally the result of low stellite in the seat.

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

No human performance related root causes were identified.

IV. Analysis of the event

BFN, Unit 2, TS Surveillance Requirement (SR) 3.4.3.1 specifies verification of lift settings of the required 12 Safety/Relief Valves (S/RVs) are within a +/- 3 percent band of their setpoint values in accordance with the Inservice Testing Program. BFN, Unit 2, has thirteen MSRVs to satisfy this requirement with margin. When tested, the following S/RVs were outside the allowable +/- 3 percent band:

<u>S/RV ID Number</u>	<u>Setpoint (psig)</u>	<u>Test Result (psig)</u>	<u>Difference (Percent)</u>
2-PCV-001-0023	1135	1266.6	11.59%
2-PCV-001-0031	1135	1188.6	4.72%
2-PCV-001-0041	1155	1212.5	4.98%
2-PCV-001-0179	1155	1229.4	6.44%

Prior to startup from 2R23 all thirteen MSRV pilot valves were replaced with refurbished valves which were certified to lift within +/- 1 percent of their setpoint. Operating Experience has shown that Target Rock two-stage MSRV setpoint drift is not a uniform, linear process. The corrosion bonding increases at a random rate.

V. Assessment of Safety Consequences

System availability was not impacted by this event. The failure of the MSRV pilot valves to meet their TS 3.4.3 specified mechanical setpoints did not impact their remote manual operation or



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activation through the MSR/V Automatic Actuation Logic, because these operating modes and functions rely upon electrically signaled control air solenoids to open the MSR/V pilot valves.

TS Bases 3.4.3 states that the overpressure protection system must accommodate the most severe pressurization transient. The MSR/Vs remained capable of maintaining the reactor pressure below 1375 psig, which is the ASME code limit (110 percent of the vessel design pressure), and the valves remained capable of performing their required safety function.

Based on the above, the 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

Each BFN operating unit has a non-safety related, electrical logic system (MSR/V Actuation Logic) installed, which provides defense in depth against MSR/V setpoint drift by electrically opening MSR/V groups based upon setpoints at 1135 psig, 1145 psig, and 1155 psig. Therefore, during a reactor pressure transient event, the four 1135 psig group MSR/Vs, followed by the four 1145 psig group MSR/Vs, and finally the five 1155 psig group MSR/Vs would receive an electrical open signal, providing a defense in depth function to allow the valves to perform their safety function.

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 occur when the reactor was shutdown.

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

TS 3.4.3 requires twelve of the thirteen S/RVs to be operable for S/RV system operability. While four of thirteen valves failed to meet their TS SR 3.4.3.1 limits for an indeterminate period, they remained capable of performing their required safety function.

VI. Corrective Actions

MSR/V 2-PCV-001-0041 had been declared TS inoperable during the fuel cycle due to simmering and gross leakage, and Condition Report (CR) 1985102 was initiated. Corrective Actions for this event are being managed by the TVA's corrective action program under CR 2022214.



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NARRATIVE

A. Immediate Corrective Actions

All thirteen of the BFN, Unit 2 MSR/V pilot valves were replaced with refurbished valves during 2R23. As left testing verified that these refurbished pilot valves were within +/- 1 percent of their setpoints.

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

As discussed in previous, similar BFN LERs, a flaking issue has been noted with the platinum coated pilot discs. The Boiling Water Reactor Owners' Group (BWROG) is continuing to work toward a solution to improve the quality and adhesion of the platinum coating on the discs. The corrective actions suggested by the BWROG will be incorporated to correct setpoint drift. To reduce the probability of seat leakage occurring in the future, pilot seat rebuilds will be performed in valves that have low stellite in the seat.

VII. Previous Similar Events at the Same Site

A search of LERs from BFN, Units 1, 2, and 3 over the last five years identified eight LERs associated with MSR/V lift settings outside of TS required setpoints:

- LER 50-259/2024-004-00, for Unit 1 Cycle 15
- LER 50-296/2024-003-00, for Unit 3 Cycle 21
- LER 50-260/2023-002-00, for Unit 2 Cycle 22
- LER 50-259/2022-003-00, for Unit 1 Cycle 14
- LER 50-296/2022-001-00, for Unit 3 Cycle 20
- LER 50-260/2021-002-00, for Unit 2 Cycle 21
- LER 50-259/2020-003-01, for Unit 1 Cycle 13
- LER 50-296/2020-002-00, for Unit 3 Cycle 19

VIII. Additional Information

There is no additional information.

IX. Commitments

There are no new commitments.