



**Randy Crawford**  
Manager  
Regulatory Assurance  
225-381-4177

RBG-48270

10 CFR 50.73

January 16, 2024

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

**Subject:** Licensee Event Report 50-458 / 2023-005-00, Manual Reactor Scram Due to Lowering Feedwater Temperature Following an Automatic Isolation of Feedwater Heater String

River Bend Station – Unit 1  
NRC Docket Nos. 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.

Should you have any questions, please contact Mr. Randy Crawford, Regulatory Assurance Manager, at 225-381-4177.

Respectfully,

A handwritten signature in black ink, appearing to read 'Randy Crawford', with a long horizontal flourish extending to the right.

Randy Crawford

RC/db

**Enclosure:** Licensee Event Report 50-458 / 2023-005-00, Manual Reactor Scram Due to Lowering Feedwater Temperature Following an Automatic Isolation of Feedwater Heater String

**cc:** NRC Region IV Regional Administrator - Region IV  
NRC Senior Resident Inspector - River Bend Station

**Enclosure**

**RBG-48270**

**Licensee Event Report 50-458 / 2023-005-00, Manual Reactor Scram Due to Lowering  
Feedwater Temperature Following an Automatic Isolation of Feedwater Heater String**



# 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  
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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 email to [Infocollections.Resource@nrc.gov](mailto:Infocollections.Resource@nrc.gov), and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: [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> River Bend Station, Unit 1	<input checked="" type="checkbox"/> <b>050</b> <input type="checkbox"/> <b>052</b>	<b>2. Docket Number</b> 458	<b>3. Page</b> 1 OF 3
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**4. Title**  
 Manual Reactor Scram Due to Lowering Feedwater Temperature Following an Automatic Isolation of Feedwater Heater String

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	<input type="checkbox"/> <b>050</b>	Docket Number
11	17	2023	2023	- 005 -	00	01	16	2024	N/A	<input type="checkbox"/> <b>052</b>	N/A
									N/A	<input type="checkbox"/> <b>052</b>	N/A

<b>9. Operating Mode</b> Mode 1	<b>10. Power Level</b> 24%
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**11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

<b>10 CFR Part 20</b>	<input type="checkbox"/> 20.2203(a)(2)(vi)	<b>10 CFR Part 50</b>	<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 checked="" 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)	<b>10 CFR Part 21</b>	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<b>10 CFR Part 73</b>	<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 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**

<b>Licensee Contact</b> Randy Crawford, Regulatory Assurance Manager	<b>Phone Number (Include area code)</b> 225-381-4177
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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
X	N/A	N/A	N/A	Y	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected		15. Expected Submission Date		
<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	Month	Day	Year
		04	17	2023

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

On November 17, 2023, at 22:15 CST, with River Bend Station, Unit 1, operating in Mode 1 at 30% power, an isolation of Low-Pressure Feedwater Heater String 'A' occurred. Operators entered the applicable Abnormal Operating Procedure (AOP) and reduced power to mitigate the lowering feedwater temperature. Reactor power was lowered to 24% and a manual reactor scram was inserted at 23:55 CST. All control rods fully inserted and there were no complications. All systems responded as designed.

The cause of the Heater String isolation is still under investigation. A supplement to this report will be issued once the investigation is complete.

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of the Reactor Protection System.



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

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1. FACILITY NAME River Bend Station, Unit 1	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 458	3. LER NUMBER		
	<input type="checkbox"/> 052		YEAR 2023	SEQUENTIAL NUMBER 005	REV NO. 00

**NARRATIVE**

**EVENT DESCRIPTION**

On November 17, 2023, at 22:15 CST, River Bend Station (RBS), Unit 1, was operating at 30% power while performing plant startup activities when an isolation of Low-Pressure Feedwater Heater String 'A' [SJ] occurred. Main Control Room Operators entered Abnormal Operating Procedure – Loss of Feedwater Heating (AOP-0007) for transients involving lowering feedwater temperature. AOP-0007, Attachment 1 (Feedwater Temperature vs Core Thermal Power Graph), provides guidance for power operations with reduced feedwater temperature from 100% reactor power to 25% reactor power. In accordance with AOP-0007, Attachment 1, operators began to manually insert control rods using the Control Rod Drive System [AA] to exit the restricted region for power operations at the lower feedwater temperature. Control rod insertion lowered power to 24%, which placed the unit below the graph start point of AOP-0007, Attachment 1. At 23:55 CST, while RBS was operating at 24% power, a manual reactor scram was inserted due to operation below the graph start point of AOP-0007, Attachment 1, caused by continued lowering of feedwater temperature. All control rods fully inserted and there were no complications. All systems responded as designed.

AOP-0007, Attachment 1, contains a graph of feedwater temperature versus core thermal power; however, no information is provided for power levels below 25.7% of rated power. With reactor power lowering to 24%, the operators were not able to determine if the unit was operating in an acceptable region. Therefore, the conservative decision was made to manually scram the reactor. Following the initial investigation, engineering input from calculations performed as part of an engineering change has provided new information for operating at power levels below 25.7%.

This event was reported under 10 CFR 50.72(b)(2)(iv)(B), as any event or condition that results in actuation of the Reactor Protection System (RPS) when the reactor is critical and 10 CFR 50.72(b)(3)(iv)(A) Specified System Actuation as result of Group 3 isolations (EN 56863).

This report is made pursuant to 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of the Reactor Protection System.

**EVENT CAUSE**

The root cause evaluation for the automatic isolation of the Low-Pressure Feedwater Heater String 'A' is still in progress.

**SAFETY ASSESSMENT**

The actual consequence was the initiation of a manual scram. Following the scram, reactor pressure was maintained by the Turbine Steam Drains [TF] and reactor water level was maintained by the Feedwater [SJ] system. The RBS power to flow map continued to meet the licensing acceptance criteria parameters. There were no actual consequences to general safety of the public, nuclear safety, industrial safety, and radiological safety for this event.

**CORRECTIVE ACTIONS**

Clarifying information and technical basis was added to AOP-0007 to help operators better understand the applicable guidance for power operations at reduced feedwater temperatures.

The Feedwater Temperature vs Core Thermal Power Graph in AOP-0007 will be updated for power operations below 25.7%



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	<input type="checkbox"/> 052		YEAR 2023	SEQUENTIAL NUMBER 005	REV NO. 00

**NARRATIVE**

**PREVIOUS SIMILAR OCCURRENCES**

This section will be updated in the supplemental report following the completion of the investigation.

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