

10 CFR 50.73

June 12, 2020  
BW200055

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

Braidwood Station, Unit 2  
Renewed Facility Operating License No. NPF-77  
NRC Docket No. STN 50-457

Subject: Licensee Event Report 2020-001-00 – Three Main Steam Safety Valves Failed  
Setpoint Testing

The enclosed Licensee Event Report (LER) is being submitted in accordance with 10 CFR 50.73, "Licensee Event Report System."

There are no regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact Mr. Kevin Lueshen, Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,



John Keenan  
Site Vice President  
Braidwood Station

Enclosure: LER 2020-001-00

cc: NRR Project Manager – Braidwood Station  
Illinois Emergency Management Agency – Division of Nuclear Safety  
US NRC Regional Administrator, Region III  
US NRC Senior Resident Inspector (Braidwood Station)  
Illinois Emergency Management Agency – Braidwood Representative



## 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 Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [infocollect.Resource@nrc.gov](mailto:infocollect.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; e-mail: [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.

1. Facility Name Braidwood Station, Unit 2	2. Docket Number 05000457	3. Page 1 of 4
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4. Title Licensee Event Report 2020-001-00 – Three Main Steam Safety Valves Failed Setpoint Testing
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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
04	15	2020	2020	- 001	- 00	06	12	2020	N/A	N/A
9. Operating Mode			11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)							
1			<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<input type="checkbox"/> 50.73(a)(2)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
			<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)(B)		<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
			<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(iii)		<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
			<input type="checkbox"/> 20.2203(a)(2)(i)		<input type="checkbox"/> 50.36(c)(1)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)	
10. Power Level			<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 50.36(c)(1)(ii)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		<input type="checkbox"/> 73.71(a)(4)	
075			<input type="checkbox"/> 20.2203(a)(2)(iii)		<input type="checkbox"/> 50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.71(a)(5)	
			<input type="checkbox"/> 20.2203(a)(2)(iv)		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.77(a)(1)	
			<input type="checkbox"/> 20.2203(a)(2)(v)		<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(2)(i)	
			<input type="checkbox"/> 20.2203(a)(2)(vi)		<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)		<input checked="" type="checkbox"/> 50.73(a)(2)(vii)		<input type="checkbox"/> 73.77(a)(2)(ii)	
			<input type="checkbox"/> 50.73(a)(2)(i)(C)				<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)			

## 12. Licensee Contact for this LER

Licensee Contact Kevin Lueshen, Regulatory Assurance Manager	Telephone Number (Include Area Code) (815) 417-2800
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## 13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
D	SB	RV	D243	Y	N/A	N/A	N/A	N/A	N/A

## 14. Supplemental Report Expected

## 15. Expected Submission Date

<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	<input checked="" type="checkbox"/> No	Month	Day	Year
		N/A	N/A	N/A

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On April 15 and 16, 2020, pre-outage testing was initiated for the main steam safety valves for setpoint verification per Technical Specification 3.7.1, Main Steam Safety Valves (MSSVs). During the testing, three of the valves failed to meet the as-found set pressure acceptance criteria. Each valve was inoperable during the test, and the appropriate Limiting Condition for Operation (LCO) was in effect at the time. The valves were subsequently adjusted, passed all required as-left requirements, declared Operable and the LCO exited.

The apparent cause of the MSSVs as found setpoints being out of tolerance was that a governing document had not been established to formalize best practices for testing and setpoint adjustment of MSSVs, which pre-disposed the valves to larger drift levels over their service time. Corrective actions completed included adjusting the valves to acceptable values during testing and rebuilding the MSSV 2MS016A. Planned corrective actions include scheduling the MSSVs 2MC014B and 2MS016C into the next refueling outage and incorporating best practices into the appropriate processes.

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Braidwood Station, Unit 2	05000457	2020	- 001	- 00

**NARRATIVE****A. Plant Operating Conditions Before the Event:**

Event Date: April 15, 2020

Unit: 1 MODE: 1

Reactor Power: 75 percent

Unit 1 Reactor Coolant System [AB]:

Normal operating temperature and pressure

**B. Description of Event:**

No structures, systems or components were inoperable at the start of this event that contributed to the event.

On April 15 and 16, 2020, pre-outage testing was performed for the main steam safety valves (MSSVs) [SB] for their setpoint verification per Technical Specification (TS) 3.7.1, Main Steam Safety Valves (MSSVs), prior to refueling outage A2R21. During testing, the as-found set points for the MSSVs 2MS016A, 2MS014B, and 2MS016C failed to meet the as-found set pressure acceptance criteria, which is TS allowed +/- 3 percent. The values were: +4.18 percent (2MS016A), +3.9 percent (2MS014B), and +3.13 percent (2MS016C). Note that each valve was inoperable at the time of the test due to being tested with the testing equipment, and the appropriate Limiting Condition for Operation (LCO) was in effect at the time. The valves were subsequently adjusted and passed all required as-left test requirements, declared Operable and the LCO exited after the testing equipment was removed.

Discrepancies found in TS surveillance tests are normally assumed to occur at the time of the test unless there is firm evidence, based on a review of relevant information that the discrepancy occurred earlier. However, on April 15 and 16, 2020, multiple valves (2MS016A, 2MS014B and 2MS016C) were found to lift with setpoints outside of TS limits, which is an indication that the discrepancies may have arisen over a period of time. It is reasonable to assume the condition existed during plant operation in excess of TS LCO completion times. Therefore, this event was determined to be reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), any operation or condition prohibited by the plant's Technical Specifications.

Additionally, because the discrepancies affected multiple valves being inoperable, this event is reportable in accordance with 10 CFR 50.73(a)(2)(vii), any event where a single cause or condition caused two independent trains or channels to become inoperable in a single system designed to mitigate the consequences of an accident.

**C. Cause of Event**

The apparent cause of the three MSSVs as found setpoints being out of tolerance was that a governing document had not been established to formalize best practices for testing and setpoint adjustment of MSSVs. This allowed for gaps in in both site and vendor activities where either very large adjustments or multiple back to back adjustments were made with insufficient stabilization lifts in between. This pre-disposed the valves to larger drift levels over their service time. The result was the three MSSVs setpoints drifted beyond the technical specification allowed 3 percent range.

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**NARRATIVE****D. Safety Consequences:**

There were no actual safety consequences impacting plant or public safety as a result of this event. This event captures a setpoint discrepancy, and not an actual demand for the 2MS016A, 2MS014B and 2MS016C valves to lift.

The MSSVs are credited for protection of the main steam supply system and protect fuel departure from nucleate boiling limits under the External Loss of Load/Turbine Trip event. These analyses assume a plus 4% error in the lift setpoint of all the Unit 2 MSSVs. For the overpressure protection assumptions, while the lift setpoint for valve 2MS016A exceeded 4%, the average lift setpoint for all five MSSVs (2MS013A, 2MS014A, 2MS015A, 2MS016A, and 2MS017A) on the 2A steam generator is about 1.72% above nominal. This is more than 2.2% lower than the 4% drift assumed in the analyses. Therefore, the recorded lift point deviations did not affect the accident analyses.

The MSSVs are also modeled in the Updated Final Safety Analysis Report (UFSAR) Chapter 15 analyses as a release path for radiological releases. These analyses are reviewed to determine if the as-found lift pressure condition can impact the analyses. The radiological consequence calculation for the steam generator tube rupture (SGTR) event for Braidwood Unit 2 assumes the power operated relief valve on the ruptured steam generator is assumed to be stuck open for 30 minutes. The out-of-tolerances for the MSSVs result in a lift pressure above the nominal setpoint of 1190 psia. Therefore, the dose analysis from the SGTR event is not affected as the MSSVs would remain closed, as assumed.

Dose calculations for releases other than SGTRs assume MSSVs as a release path. The current calculation assumes all 20 MSSVs remains open at a pressure of 1022.2 psig (using a 10% blowdown with the MSSV lowest setpoint of 1175 psig).

The out-of-tolerances for the MSSVs result in a lift pressure above the nominal setpoint of 1175 psig (1190 psia). Therefore, the input to dose analysis for events other than the SGTR is not affected.

Based on no impact to the design analysis determined, the safety function of the MSSVs was not lost. Therefore, there was no safety system function failure due to this event.

**E. Corrective Actions:****Completed Corrective Actions:**

- The 2MS016A, 2MS014B and 2MS016C valves were adjusted to acceptable values during testing, and the 2MS016A valve was rebuilt.

**Planned Corrective Actions:**

- Schedule the 2MS014B and 2MS016C valves into the next refueling outage.
- Incorporate best practices into the appropriate processes.

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**NARRATIVE****F. Previous Occurrences:**

No previous, similar Licensee Event Reports were identified at the Braidwood Station in the past three years.

**G. Component Failure Data:**

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model</u>	<u>Mfg. Part Number</u>
Dresser	Main Steam Safety Relief Valves	3707R	N/A