

Rod L. Penfield
Site Vice President724-682-5234
Fax: 724-643-8069December 30, 2019
L-19-294

10 CFR 50.73

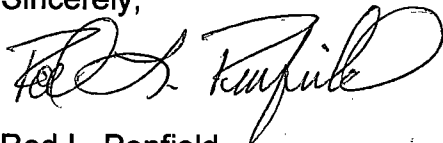
ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001SUBJECT:
Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
LER 2019-001-00

Enclosed is Licensee Event Report (LER) 2019-001-00, "Low Head Safety Injection Discharge Relief Valve Did Not Reseat During Surveillance Test". This event is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B) and 10 CFR 50.73(a)(2)(v)(B), (C), (D).

There are no regulatory commitments contained in this submittal. Any actions discussed in this document that represent intended or planned actions are described for the NRC's information, and are not regulatory commitments.

If there are any questions or if additional information is required, please contact Mr. Steve Sawtschenko, Manager, Regulatory Compliance and Emergency Response, at 724-682-4284.

Sincerely,

Rod L. Penfield
Site Vice President

Enclosure – Beaver Valley Power Station, Unit 1 LER 2019-001-00

cc: Mr. D. C. Lew, NRC Region I Administrator
Mr. J. A. Krafty, NRC Senior Resident Inspector
Ms. J. C. Tobin, NRC Project Manager
INPO Records Center (via INPO Industry Reporting and Information System)
Mr. L. Winker (BRP/DEP)TEZZ
NRR

Enclosure
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Beaver Valley Power Station, Unit 1 LER 2019-001-00



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-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollect.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOS-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name Beaver Valley Power Station, Unit 1					2. Docket Number 05000 334		3. Page 1 OF 4					
4. Title Low Head Safety Injection Discharge Relief Valve Did Not Reseat During Surveillance Test												
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		
11	2	2019	2019	001	00	12	30	2019	N/A	05000		
9. Operating Mode									11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
3			<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 checked="" 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)		
0			<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)			<input checked="" 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 checked="" 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 checked="" 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 type="checkbox"/> 50.73(a)(2)(i)(B)			<input 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 Steve Sawtschenko, Manager, Regulatory Compliance and Emergency Preparedness							Telephone Number (Include Area Code) 724-682-4284					
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			
14. Supplemental Report Expected					15. Expected Submission Date				Month	Day	Year	
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No												
Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)												
<p>On November 2, 2019, during the Unit 1 twenty-sixth refueling outage (1R26), while performing a surveillance test on the 'A' Low Head Safety Injection (LHSI) Pump, the 'A' LHSI discharge relief valve lifted and did not reseat, resulting in approximately 850 gallons of Emergency Core Cooling System water from the Refueling Water Storage Tank (RWST) being discharged to the local area sump. At 1515 hours, the RWST was declared Inoperable due to low level. The 'A' LHSI discharge relief valve was isolated to prevent further leakage, and makeup to the RWST was commenced. At 1602 hours, the RWST was declared Operable. The cause was that personnel did not implement actions intended to ensure that the guide ring settings for spare Crosby relief valves were verified, validated, and corrected, resulting in the valve being installed during 1R26 with its guide ring likely improperly set.</p> <p>Engineering analysis determined that the postulated design basis Large Break Loss of Coolant Accident would exceed regulatory limits and the projected dose would exceed the Exclusion Area Boundary dose limit, and the General Design Criteria 19 for control room dose limit. The safety significance of the relief valve lifting was very low. This event is reportable per 10 CFR 50.73(a)(2)(ii)(B) and 10 CFR 50.73(a)(2)(v)(B), (C), (D) as reported by Event Notification 54366 on November 2, 2019 at 2303 hours.</p>												

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

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1. FACILITY NAME

Beaver Valley Power Station, Unit 1

2. DOCKET NUMBER

05000-

334

3. LER NUMBER**YEAR**

2019

**SEQUENTIAL
NUMBER**

001

**REV
NO.**

00

NARRATIVE

Energy Industry Identification System (EIS) Codes identified in the text as [XX]

CONDITIONS PRIOR TO OCCURRENCE:

Beaver Valley Power Station Unit 1 was in Mode 3 at 0 percent power.

There were no structures, components, or systems that were inoperable at the start of the event that contributed to the event beyond those described.

DESCRIPTION OF EVENT:

On November 2, 2019, Beaver Valley Power Station (BVPS) Unit 1 performed surveillance test 1OST-11.1, "Safety Injection Pump Test," Revision 27, on the 'A' Low Head Safety Injection (LHSI) pump (1SI-P-1A) [BP] during the twenty-sixth refueling outage (1R26) while at 0 percent power. This quarterly test verifies that the 'A' LHSI pump starts and delivers enough flow on recirculation to satisfy Technical Specification (TS) and American Society of Mechanical Engineers (ASME) requirements.

During the surveillance test, the Refueling Water Storage Tank (RWST) [TK] level began to drop resulting in a low level alarm. It was later determined that approximately 850 gallons of water from the RWST was transferred to the safeguards building sump. At 1515 hours on November 2, 2019, the RWST was declared Inoperable due to low level. The 'A' LHSI pump was secured and the RWST level drop ceased. BVPS Unit 1 entered TS 3.5.4 for the RWST Inoperable and TS 3.5.2 for two trains of LHSI being Inoperable. The leakage coincident with Transfer to Recirculation following a design basis Large Break Loss of Coolant Accident (LOCA) would result in exceeding the Dose Analysis in the Control Room. Therefore, the Control Room Envelope was Inoperable for both Unit 1 and Unit 2, causing both units to enter Technical Specification 3.7.10 for the Control Room Envelope boundary not being adequate since the Units share a common control room.

It was determined that the 'A' LHSI discharge relief valve (RV-1SI-845A) [RV] was lifting. The purpose of the relief valve is to provide relief protection to the low-pressure piping when the pump discharge path to the Reactor Coolant System [AB] is closed by either a closed motor operated valve or a check valve held shut by higher Reactor Coolant System pressure. This portion of the LHSI system has three relief valves to provide overpressure protection. Relief valve RV-1SI-845A protects the LHSI Train 'A'; relief valve RV-1SI-845C protects the LHSI Train 'B'; relief valve RV-1SI-845B protects a line common to both the 'A' and 'B' trains. The 'A' LHSI discharge relief valve was isolated, and a temporary gag was placed on RV-1SI-845A through the temporary modification process and will be removed in Unit 1 twenty-seventh refueling outage (1R27).

The BVPS Unit 1 'A' LHSI System was declared Operable, and both BVPS Units exited applicable Technical Specifications Actions for TS 3.5.2. Makeup to the RWST was completed and at 1602 hours on November 2, 2019, the RWST was declared Operable, exiting applicable Technical Specifications Actions for 3.5.4.

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NARRATIVE**CAUSE OF EVENT:**

The direct causes were identified as Low Head Safety Injection (LHSI) relief valves have a set pressure below the high-peak LHSI pump start pressure pulse and RV-1SI-845A did not reseal when system pressure dropped below the expected design blowdown pressure. This was because station personnel did not implement the actions intended to ensure that the guide ring settings for spare Crosby relief valve S/N 54679 were verified, validated, and corrected, prior to installation into the LHSI system. Specifically, the corrective action that was intended to verify the settings for S/N 54679 was ultimately closed to generic process guidance versus discrete action, resulting in the valve being installed at the RV-1SI-845A location during 1R26 with its guide ring likely improperly set.

Since RV-1SI-845A did not reseal until 'A' LHSI pump was secured, the blowdown adjustment ring setting was most likely not set correctly. In addition, the LHSI system dynamics and associated pressure surges have not been adequately bounded to address and preclude relief valves momentarily lifting when LHSI pumps are started for routine testing or plant evolutions. As a result, the relief valves on the discharge header of the LHSI system are called upon to lift and reseal on a more frequent basis than intended, creating opportunities for a valve to fail to reseal and potentially damaging internal valve components over time due to repeated cycling. Two additional instrumented runs of the 'A' LHSI pump were performed while recording pressures measured upstream and downstream of the currently isolated RV-1SI-845A. Upon pump start, a momentary pressure pulse above the lift setpoint of the relief valves was noted upstream of RV-1SI-845A, and both RV-1SI-845B and RV-1SI-845C were visually observed to lift and reseal. This was the first test of the LHSI discharge header relief valves in which a pressure spike in excess of the relief valve setpoints was observed, and the first in which the valves were physically observed to lift.

ANALYSIS OF EVENT:

The plant risk associated with the BVPS Unit 1 relief valve RV-1SI-845A leakage on November 2, 2019, during performance of surveillance test 1OST-11.1, "Safety Injection Pump Test," is considered to be very low. This is based on meeting the surveillance test pump flow acceptance criteria for the 'A' LHSI pump, which assures that the pump will satisfy its design intent to deliver sufficient flow upon safety injection recirculation. It is therefore concluded that there is reasonable assurance that the leakage was small enough such that there would not be a loss of the safety injection recirculation safety function or significant impact on the BVPS Unit 1 Emergency Core Cooling System (ECCS) to mitigate core damage. Additionally, the ECCS leakage that bypasses containment would not lead to any large early release.

Engineering evaluation concluded that the projected dose would exceed the 10 CFR 50.67 Exclusion Area Boundary dose limit, and the 10 CFR 50 General Design Criteria (GDC) 19 for control room dose limit.

Based on the above, the safety significance of the relief valve RV-1SI-845A leakage event that occurred on November 2, 2019 was very low. This event is reportable per 10 CFR 50.73(a)(2)(ii)(B) and 10 CFR 50.73(a)(2)(v)(B), (C), (D) as an Unanalyzed Condition and a condition that could have prevented the Fulfillment of a Safety Function as reported by Event Notification (EN) 54366 on November 2, 2019 at 2303 hours.

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		YEAR	SEQUENTIAL NUMBER	REV NO.
Beaver Valley Power Station Unit 1	05000-334	2019	001	00

NARRATIVE**CORRECTIVE ACTIONS:**

1. The 'A' LHSI discharge relief valve, RV-1SI-845A, was isolated, and a temporary gag was installed through the temporary modification process. (Complete November 02, 2019)
2. The 'A' LHSI discharge relief valve, RV-1SI-845A, will be removed during the next refueling outage and tested to verify the blowdown ring setting.
3. All the Crosby model JRAK relief valves with undocumented blowdown ring settings will be sent out to a qualified vendor for refurbishment, testing and reset of the rings to achieve a blowdown of 10% below the setpoint value. Validate and document the final blowdown ring settings from vendor report.

Completion of items 2 and 3 listed above are being tracked in the Corrective Action Program.

PREVIOUS SIMILAR EVENTS:

A review of previous similar incidents found the following:

BVPS Unit 1 LER 2010-003-00, "Premature Lifting of ECCS Relief Valve Results in Post-Accident Outside-Containment Leakage Limits to Be Exceeded" (CR-10-85863). The existing discharge piping of RV-1SI-845B placed an adverse force on the relief valve (i.e., nozzle loading) due to inadequate piping support and/or incorrect piping alignment. This nozzle loading resulted in the relief valve lifting at a lower pressure than its set pressure (235 psig) in its installed location. This relief valve showed an acceptable lift pressure setpoint during bench testing prior to its installation in November 2010. Corrective actions were to repair the existing discharge piping configuration for valve RV-1SI-8458 and correct possible misconfiguration of the discharge piping for sister valves RV-1SI-845A/C.

CR-2019-09261