



Beaver Valley Power Station  
P.O. Box 4  
Shippingport, PA 15077

**Rod L Penfield**  
Site Vice President

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November 13, 2020  
L-20-296

10 CFR 50.73

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

SUBJECT:  
Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66  
LER 2020-001-00

Enclosed is Licensee Event Report (LER) 2020-001-00, "Intake Structure Interconnecting Flood Door Found Open Resulting in a Loss of Train Separation for the River Water System". This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(v)(A), 10 CFR 50.73(a)(2)(v)(B), and 10 CFR 50.73(a)(2)(vii) parts (A) and (B).

There are no regulatory commitments contained in this submittal. Any actions described in this document represent intended or planned actions and are described for information only.

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

MATT ENUS FOR ROD PENFIELD  
GENERAL PLANT MANAGER

IEZZ  
NRR

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

Enclosure  
L-20-296

Beaver Valley Power Station, Unit 1 LER 2020-001-00



**LICENSEE EVENT REPORT (LER)**

(See Page 3 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 e-mail to [Infocollections.Resource@nrc.gov](mailto:Infocollections.Resource@nrc.gov), and the OMB reviewer at [OMB.Office.of.Information.and.Regulatory.Affairs](mailto:OMB.Office.of.Information.and.Regulatory.Affairs), (3150-0104), Attn: Desk at [pra\\_submission@omb.eop.gov](mailto:pra_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> Beaver Valley Power Station, Unit 1	<b>2. Docket Number</b> 05000                      00334	<b>3. Page</b> 1 OF 4
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**4. Title**  
Intake Structure Interconnecting Flood Door Found Open Resulting in a Loss of Train Separation for the Reactor Plant River Water System

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
09	16	2020	2020	001	00	11	13	2020		05000
									Facility Name	Docket Number
										05000

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

<input type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<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"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 10 CFR Part 21	<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)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 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"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<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"/> 20.2203(a)(2)(v)	<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)	

OTHER (Specify here, in abstract, or NRC 386A)

**12. Licensee Contact for this LER**

<b>Licensee Contact</b> Steve Sawtschenko, Manager, Regulatory Compliance and Emergency Response	<b>Phone Number (include area code)</b> 724-682-4284
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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

**14. Supplemental Report Expected**

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)
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**15. Expected Submission Date**

Month	Day	Year

**16. Abstract** (Limit to 1580 spaces, i.e., approximately 15 single-spaced typewritten lines)  
On September 16, 2020, with the Beaver Valley Power Station operating at 100% power, the interconnecting flood door separating the two redundant trains of River Water was found to be open. The control room was notified and the interconnecting flood door was closed. A past operability review determined that with this door open, both trains of River Water were inoperable due to a loss of train separation from a postulated internal flood in one of the cubicles. The amount of time that the interconnecting flood door was left open prior to discovery could not be determined but was bounded to 218 days.

The apparent cause is an organizational latent acceptance of weak configuration controls applied to a risk significant flooding boundary door. A contributing cause was limited sensitivity to the abnormal condition of this door. Corrective Actions include installing a locking mechanism on the interconnecting flood doors and updating procedures and placards to clarify the importance of the position of the interconnecting flood doors

This is being reported under 10 CFR 50.73(a)(2)(i)(B); 10 CFR 50.73(a)(2)(v)(A) and 10 CFR 50.73(a)(2)(v)(B), and 10 CFR 50.73(a)(2)(vii) parts (A) and (B).



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

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<b>1. FACILITY NAME</b>		<b>2. DOCKET NUMBER</b>		<b>3. LER NUMBER</b>		
Beaver Valley Power Station, Unit 1		05000-00334		YEAR	SEQUENTIAL NUMBER	REV NO.
				2020	001	00

**NARRATIVE**

Energy Industry Identification System (EIS) codes are identified in the text as [XX].

**BACKGROUND**

Beaver Valley Unit 1 has a safety-related Reactor Plant River Water (RPRW) system [BI] consisting of two redundant trains and three pumps available to supply the two trains. Normally, the A pump supplies the A train, the B pump supplies the B train, and the C pump is a spare not normally aligned to either train. One train is in service while the other is aligned in standby. The pumps are located at the Intake Structure [MK] within separate pump cubicles. The Intake Structure has four pump cubicles, A, B, C, and D. The three RPRW pumps are located each in their respective cubicles (A pump in the A cubicle, B pump in the B cubicle, and C pump in the C cubicle). The A and B cubicles (as well as the C and D cubicles) are interconnected with a sliding flood door and a fire door which are both normally closed.

Maintaining the interconnecting flood doors closed was implemented following completion of a 1998 10 CFR 50.59 evaluation that identified an unreviewed safety question (USQ) related to a previously unpostulated Beaver Valley Unit 1 River Water line rubber expansion joint (REJ) rupture in an intake structure cubicle. A License Amendment Request (LAR) was submitted to the Nuclear Regulatory Commission (NRC) to revise the Updated Final Safety Analysis (UFSAR) to maintain the interconnecting flood doors normally closed. A Safety Evaluation (License Amendment Nos. 218 for Unit 1 and 96 for Unit 2) dated December 16, 1998, was issued and the licensing basis was revised to maintain the interconnecting flood doors between the cubicles containing redundant RPRW/Service Water pumps in the closed position to protect the interconnecting cubicles from the consequences of a major pipe REJ failure.

The applicable Technical Specification (TS) is 3.7.8 Service Water System (SWS); LCO 3.7.8 Two SWS trains shall be OPERABLE in MODES 1-4. SWS is commonly referred to as the Reactor Plant River Water System for Unit 1. SWS is the terminology used for Unit 2.

**DESCRIPTION OF EVENT**

The Unit was in Mode 1 at 100% power. No equipment was inoperable which contributed to this event. The A train of RPRW was in service with the A RPRW pump running, B train was in standby.

On September 16, 2020 during a Design Bases Assurance Inspection (DBAI) walkdown of the B cubicle for an unrelated component, the NRC inspector questioned why the interconnecting flood door was open. At 1129 the Control Room was notified that the interconnecting flood door was open. The door was closed approximately 18 minutes after the control room was notified. In keeping with procedural guidance, one train (Train B) of RPRW was declared inoperable. Train A was considered operable and therefore it was determined that a loss of safety function did not exist. A past operability review was requested.

While reviewing for past operability, it was determined that a loss of safety function existed with the interconnecting flood door open and no compensatory measures in place. This evaluation was finalized on October 21, 2020. This is the discovery date for the loss of safety function.



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1. FACILITY NAME Beaver Valley Power Station, Unit 1	2. DOCKET NUMBER 05000-00334	3. LER NUMBER		
		YEAR 2020	SEQUENTIAL NUMBER 001	REV NO. 00

**NARRATIVE**

**DESCRIPTION OF EVENT (continued)**

The amount of time that the interconnecting flood door was left open prior to discovery could not be determined. The flood door seals were last tested on February 11, 2020. Upon test completion the door was verified and documented to be closed. It is unknown when after this test that the interconnecting flood door was reopened. As such, both trains are considered to have been inoperable for 218 days.

**CAUSE OF EVENT**

The apparent cause is an organizational latent acceptance of weak configuration controls applied to a risk significant flooding boundary door. The condition report investigation identified inadequate controls including physical, administrative, and knowledge type controls.

Additionally, a contributing cause was the 'B' intake bay cubicle physical layout limited personnel sensitivity to the abnormal condition of the Interconnecting Flood Door. Limited sensitivity was compounded by inconsistent knowledge of door function and required position, infrequent interaction with interconnecting flood doors, and related operator round readings not highlighting door importance.

The available procedural guidance for opening the interconnecting flood doors does not discuss the loss of safety function that would occur during the postulated REJ rupture when the interconnecting flood door is open, which contributed to the delayed identification of the loss of safety function.

**ANALYSIS OF EVENT**

This event resulted in operation prohibited by TS, reportable under 10 CFR 50.73(a)(2)(i)(B). Additionally, this was a loss of safety function, reportable under 10 CFR 50.73(a)(2)(v)(A) and 10 CFR 50.73(a)(2)(v)(B), due to both trains of RPRW being inoperable. Finally, due to the postulated REJ failure requiring the interconnecting flood door to be closed for train separation, this event resulted in common cause inoperability of both independent trains, reportable under 10 CFR 50.73(a)(2)(vii) parts (A) and (B).

As the discovery of the loss of safety function occurred during the past operability review, the condition that could have prevented the fulfillment of the safety function had already been corrected. Therefore, an event notification per 10 CFR 50.72(b)(3)(v) was not required.

Considering the initiating event frequencies of all internal flooding scenarios defined for the affected pump cubicles A and B, both those included in the final PRA models and those which quantitatively screened out, and using the bounding Conditional Core Damage Probability (CCDP) for simultaneously failing all credited equipment in both pump cubicles, the risk of having interconnecting flood door BV-1SI05-1.1 [A TO B INTAKE CUBICLE CROSS-TIE FLOOD DOOR] open beginning on February 11, 2020 and ending on September 16, 2020 for a bounding time period of 218 days is determined to be of very low safety significance for both BVPS-1 and BVPS-2.



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				2020	001	00

**NARRATIVE**

**ANALYSIS OF EVENT (continued)**

Although the open interconnecting flood door impact is to BVPS-1, the effects on BVPS-2 were considered since the BVPS-2 spare Service Water Pump is located in the B Intake Structure pump cubicle. The other two SWS pumps are located in the C and D cubicles which do not interconnect to those where the River Water REJ break is postulated (A and B). The PRA impact was considered in the PRA model as noted, taking into account the probability that the spare SWS pump could have been in service over the identified period.

**CORRECTIVE ACTIONS**

**Completed Actions:**

The interconnecting flood door was closed to its correct position on September 16, 2020.

The outside tour logs were revised on September 17, 2020 to include readings to verify the two interconnecting flood doors are SHUT.

Training analysis forms for Initial Training Courses on Unit 1 RPRW and Unit 2 SWS were updated on September 17, 2020 to include explicit information regarding the two interconnecting flood doors.

Temporary stanchions and signage were placed in front of the interconnecting flood doors on November 6, 2020 as an interim measure until the locking mechanism is installed.

**Planned Actions:**

An appropriate locking mechanism will be designed and installed at both interconnecting flood doors to secure them in the closed position.

The Operations procedures containing guidance relating to the Intake Structure flood doors will be updated to contain a discussion of the impact of the interconnecting flood doors being open when in the incorrect pump configuration resulting in a loss of safety function.

The placards on the interconnecting flood doors will be changed to provide clear guidance regarding the impact of the interconnecting flood door on RPRW/SWS systems in order to improve the effectiveness of the barrier.

**PREVIOUS SIMILAR EVENTS**

Beaver Valley Licensee Event Report (LER) 2017-001-00, Inadequate Tornado Missile Protection Identified Due to Non-Conforming Design Conditions, describes an event where two tornado missile barrier doors were found to be open for an unspecified period of time. The discovery was made during an evaluation of tornado missile vulnerabilities in response to NRC Regulatory Issue Summary 2015-06 "Tornado Missile Protection" per CR 2017-01963. The apparent cause was the importance of the function of tornado missile barriers was not identified in plant processes such that site personnel could implement the requirements for missile barrier protection.

Condition Report 2020-07218