



FirstEnergy Nuclear Operating Company

Peter P. Sena III
Site Vice President

724-682-5234
Fax: 724-643-8069

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10 CFR 50.73

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

SUBJECT:
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 2008-001-00

Enclosed is Licensee Event Report (LER) 2008-001-00, "Unplanned Actuation of the Auxiliary Feedwater System During Plant Startup."

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 you have questions or require additional information, please contact Mr. Colin P. Keller, Manager, Regulatory Compliance at 724-682-4284.

Sincerely,

Peter P. Sena III

Attachment

- c: Mr. S. J. Collins, NRC Region I Administrator
- Mr. D. L. Werkheiser, NRC Senior Resident Inspector
- Ms. N. S. Morgan, NRR Project Manager
- INPO Records Center (via electronic image)
- Mr. L. E. Ryan (BRP/DEP)

LEA
MR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-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 Number 2	2. DOCKET NUMBER 05000412	3. PAGE 1 of 5
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4. TITLE
Unplanned Actuation of the Auxiliary Feedwater System During Plant Startup

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
05	24	2008	2008	001	00	07	23	2008	None	
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
10. POWER LEVEL 16	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(a)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<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)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<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)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Colin P. Keller, Manager, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) (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 EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> NO			

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On May 24, 2008 at 09:38 during a plant startup power increase in preparation to roll the turbine and synchronize to the grid, Beaver Valley Power Station Unit 2 experienced an Engineered Safety Feature (ESF) actuation P-14 due to Steam Generator (SG) HI-HI water level in the "A" Steam Generator. This ESF actuation initiated automatic actions resulting in full feedwater isolation, trip of the only operating "B" main feedwater pump and start of two Auxiliary Feedwater System pumps. The unplanned automatic initiation of the Auxiliary Feedwater System due to tripping of the Main Feedwater pump was an event reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A).

The cause of the steam generator high level transient is that the Operations crew on duty during this event was unfamiliar with steam generator level control using bypass feed regulating valves at low power with the main turbine not latched and in response made excessive manual changes in the feedwater flowrate. The safety significance of the event was very low.

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NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

Westinghouse - Pressurized Water Reactor {PWR}
 Main Feedwater System {SJ}
 Auxiliary Feedwater System {BA}
 Main Turbine {TA}
 Condenser {SG}

CONDITIONS PRIOR TO OCCURRENCE

Unit 2: Mode 1 at approximately 16 percent power.

There were no systems, structures, or components that were inoperable at the start of the event that contributed to the event. [It is now understood that the main feedwater pump recirculation flow control valve did not experience any failure, contrary to the preliminary conclusion originally provided on May 24, 2008 in the 10 CFR 50.72 notification EN 44239.]

DESCRIPTION OF EVENT

During plant startup at the conclusion of the 2R13 refueling outage on May 24, 2008, Beaver Valley Power Station (BVPS) Unit 2 was slowly increasing reactor power in preparation for synchronizing the Main Turbine onto the grid, with power at approximately 16 percent. The Main Turbine was offline with the condenser steam dump valves in steam pressure (automatic) mode and all three steam generator bypass feedwater regulation valves in automatic control. At approximately 09:22, a slow reactor power increase was begun. At approximately 09:28, steam generator water levels in all three steam generators started to trend down. The control room operator commenced a series of multiple manual control actions to restore / maintain steam generator water levels. During this transient, steam generator main feedwater pump 'B' was in service and its recirculation valve was observed to be cycling open and closed. In addition, condenser steam dump valves were observed to be opening and closing in response to changes in steam generator pressure.

At approximately 09:38, with the 'A' steam generator feedwater flow control bypass valve in a full closed position, a steam generator water level swell was noted as the 'A' steam generator narrow range water level reached the Hi-Hi steam generator level alarm and the Engineered Safety Features (ESF) Feedwater Isolation setpoint ($\leq 92.2\%$). In response to reaching this valid ESF high level setpoint (P-14), the running steam generator main feedwater pump tripped, the remaining steam generator bypass feedwater regulating valves closed, and the Feedwater Containment Isolation Valves closed. The two motor-driven Auxiliary Feedwater System pumps started, as designed, upon an automatic trip of all running Main Feedwater Pumps. The Feedwater Isolation signal also closes the main feedwater regulating valves (which were already closed) and trips the Main Turbine (which was offline).

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NARRATIVE

DESCRIPTION OF EVENT (continued)

At approximately 09:40, the control room crew reset the Feedwater Isolation signal and restarted the 'B' main feedwater pump. At approximately 09:41, the motor-driven Auxiliary Feedwater System pumps were stopped and placed back into automatic control. At approximately 09:43, normal feedwater flow was re-established to the steam generators. The reactor remained stable at approximately 16% reactor power.

REPORTABILITY

The unplanned automatic initiation of a Feedwater Isolation signal and the resultant automatic initiation of the Auxiliary Feedwater System due to tripping of the Main Feedwater pump was an event reportable pursuant to 10 CFR 50.72(b)(3)(iv)(A) as a valid actuation of the PWR emergency feedwater system listed in 10 CFR 50.72(b)(3)(iv)(B)(6). The NRC was notified of this event at 15:06 on May 24, 2008 (NRC Event Notification No. 44239).

Similarly, this event is reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A) as a valid actuation of the emergency feedwater system listed in 10 CFR 50.73(a)(2)(iv)(B)(6).

CAUSE OF EVENT

The Operations crew on duty during this event was unfamiliar with steam generator level control using bypass feed regulating valves at low power with the main turbine not latched and in response made excessive manual changes in feedwater flowrate. There were numerous broken barriers and causal factors that allowed this worker knowledge deficiency to exist. Since any one of these barriers and causal factors could have potentially prevented the inadvertent Auxiliary Feedwater System automatic initiation, the root cause is considered to be the common factor in all of these issues. Thus, the root cause of this event is that the Operations Management Team, including the Shift Manager, failed to ensure the startup crew was staged for success in operating the plant in a low power configuration.

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SAFETY IMPLICATIONS

The safety significance of the feedwater isolation on May 24, 2008 was very low. Steam generator inventory remained above the low water level trip throughout this event and its restoration.

As designed, feedwater isolation occurred when the "A" steam generator indicated narrow range level reached the high level setpoint of greater than or equal to 92.2 percent. Following initiation of the automatic feedwater isolation signal, all ESF equipment responded as expected. The running steam generator main feedwater pump tripped, the remaining steam generator bypass feedwater regulating valves closed, the Feedwater Containment Isolation Valves closed, and the two motor-driven Auxiliary Feedwater System pumps started, as designed. The feedwater isolation signal also closes the main feedwater regulating valves (which were already closed) and trips the Main Turbine (which was offline).

Following the unplanned actuation, the feedwater isolation signal was reset, normal feedwater flow was re-established via the "B" main feedwater pump, and auxiliary feedwater pumps were manually secured and placed back into automatic control. There were no adverse effects identified to the main steam system from the indicated high water level in the steam generators. The reactor remained stable at approximately 16% reactor power.

At the time of the BVPS Unit 2 feedwater isolation, the only out-of-service components modeled in the Unit 2 Probabilistic Risk Analysis were the "A" & "B" containment instrument air compressors, with containment instrument air being supplied from station instrument air through the open cross-tie valve 2IAC-MOV131. Additionally, with the main turbine and generator offline, the breakers associated with the fast bus transfer function were still transferred to the off-site power supplies. Also, since the reactor power level was less than 40 percent, Anticipated Transients Without Scram (ATWS) concerns are not postulated. Using these assumptions and assuming a postulated Total Loss of Main Feedwater Initiating Event (i.e., setting the Probability to 1.0), the Conditional Core Damage Probability is very small.

Based upon the above, the safety significance of the event condition was very low.

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NARRATIVE

CORRECTIVE ACTIONS

1. The BVPS Licensed Operator Retraining program will be modified to include simulator and classroom sessions that address manual operations of the bypass feedwater regulating valves at low power level, with a periodic re-training frequency.
2. Plant criteria on Just-In-Time (JIT) Training will be revised to require all control room crews and operators involved in plant startup/shutdown to attend the JIT Training.
3. Supplemental actions will be performed based upon additional performance gap analysis and safety culture assessment results.

Completion of the above and other corrective actions are being tracked through the BVPS corrective action program.

PREVIOUS SIMILAR EVENTS

A review found no prior BVPS Unit 1 and one prior BVPS Unit 2 Licensee Event Report within the last ten years for an event involving an actuation of the Auxiliary Feedwater System due to high steam generator water level.

- BVPS Unit 2 LER 2000-001, "ESF Actuation of Feedwater Isolation While Shutting the Plant Down for Refueling." This LER event resulted from lack of procedural clarity combined with simulation training not being consistent with actual plant response. The previous corrective actions were ineffective because 1) previous training to correct personnel knowledge errors was only performed one time, and 2) previous reinforcement of expectations/standards resulted in unclear expectations relative to the hierarchy of procedures.