

Lew W. Myers
Senior Vice President724-682-5234
Fax: 724-643-8069October 20, 2000
L-00-126

***Beaver Valley Power Station, Unit No. 2
Docket No. 50-412 License No. NPF-73
LER 2000-001-00***

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 2000-001-00, 10 CFR 50.73(a)(2)(iv), "ESF Actuation of Feedwater Isolation While Shutting the Plant Down for Refueling."



Lew W. Myers

Attachment



LER 2000-001-00

L-00-126

Page 2

cc: Mr. H. J. Miller, Regional Administrator
United States Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

Mr. D. S. Collins
BVPS Project Manager
United States Nuclear Regulatory Commission
Washington, DC 20555

Mr. David M. Kern
BVPS Senior Resident Inspector
United States Nuclear Regulatory Commission

Mr. J. A. Hultz
Ohio Edison Company
76 S. Main Street
Akron, OH 44308

INPO Records Center
700 Galleria Parkway
Atlanta, GA 30339-5957

Mr. L. E. Ryan
Bureau of Radiation Protection
Department of Environmental Protection
RCSOB-13th Floor
P.O. Box 8469
Harrisburg, PA 17105-8469

Manager, Nuclear Licensing and
Operations Support
Virginia Electric & Power Company
5000 Dominion Blvd.
Innsbrook Tech. Center
Glen Allen, VA 23060

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If 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.

FACILITY NAME (1)

Beaver Valley Power Station Unit 2

DOCKET NUMBER (2)

05000412

PAGE (3)

1 OF 5

TITLE (4)

ESF Actuation of Feedwater Isolation While Shutting the Plant Down For Refueling

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	23	2000	2000	-- 001	-- 00	10	20	2000	None	
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)										
OPERATING MODE (9)		1		20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)		7 %		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
				20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
				20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER
				20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		
				20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME

T. S. Cosgrove, Manager Licensing

TELEPHONE NUMBER (Include Area Code)

(724) 682-5203

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).

NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At 00:37 on September 23, 2000, Beaver Valley Power Station (BVPS) Unit 2 experienced an automatic Feedwater Isolation resulting from indicated high steam generator water level. This occurred while shutting the plant down for refueling. All plant equipment properly responded as expected. The operating crew then transitioned to the operating procedure to reset feedwater isolation signal and to restore the secondary system to normal. The automatic initiation of a Feedwater Isolation signal and the resultant automatic initiation of the Auxiliary Feedwater System due to the tripping of the Main Feedwater Pumps following the Feedwater Isolation constitutes an automatic actuation of an Engineered Safeguards Feature. This requires NRC reporting within four hours of the occurrence, pursuant to the reporting criteria of 10 CFR 50.72(b)(2)(ii), and LER reporting within 30 days of the occurrence, pursuant to the reporting criteria of 10 CFR 50.73(a)(2)(iv).

The cause was the lack of procedural clarity combined with simulation training not being consistent with actual plant response. As a result of the inadequate procedure clarity, the initial water inventory in all steam generators was inappropriately high.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Beaver Valley Power Station Unit 2	05000412	2000	- 001	- 00	2 OF 5

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

PLANT AND SYSTEM IDENTIFICATION

Westinghouse-Pressurized Water Reactor System
Engineered Safety Features Actuation System (JE)
Main Feedwater System (SJ)
Auxiliary Feedwater System (BA)

CONDITIONS PRIOR TO OCCURRENCE

Unit 2: Mode 1 at 7 % power

There were no systems, structures, or components that were inoperable that contributed to the event.

DESCRIPTION OF EVENT

At 00:37 on September 23, 2000, Beaver Valley Power Station (BVPS) Unit 2 experienced an automatic Feedwater Isolation on indicated high steam generator water level from the 21B steam generator. This occurred while shutting the plant down for refueling. The steam generators were being fed using normal feedwater through the bypass feedwater regulating valves. Steam removal was via the condenser steam dump system. The feedwater isolation resulted in the closure of feedwater isolation valves 2FWS-HYV157A, B, and C and the trip of the running main feedwater pump 2FWS-P21A. The motor driven auxiliary feedwater pumps started as designed upon the trip of the running main feedwater pump.

The operating crew verified plant equipment properly responded as expected. The operating crew then transitioned to the operating procedure to reset the feedwater isolation signal and to restore the secondary system to normal. Plant shutdown continued and at 00:39, Unit 2 entered Mode 2. After indicated steam generator water level returned to below the high level setpoint, normal feedwater flow was re-established via the main feedwater pump, 2FWS-P21A, and the bypass feedwater regulating valves at 00:42. Heat removal was maintained at all times via the normal condenser steam dump removal system. The auxiliary feedwater pumps were manually secured at 00:46. Unit 2 entered Mode 3 at 01:12 and plant cooldown continued to Mode 5.

An automatic Feedwater Isolation occurred when the indicated steam generator water level reached the setpoint of 74.6 percent. The turbine had been removed from service at 00:25 and the reactor power was 7 percent. Procedure steps to return the main steam bypass system to a setpoint of 1005 psig were in progress. The actions of returning the main steam bypass system to 1005 psig from the controlling pressure of 965 psig resulted in a reduction in narrow range steam generator levels. Operator action to raise

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Beaver Valley Power Station Unit 2	05000412	2000	- 001	- 00	3 OF 5

feedwater flow was taken to compensate for the reduction in steam generator level. The operators established steam generator level at an inappropriately high level due to lack of procedure clarity.

Feedwater temperature was reducing at the same time of the adjustment in steam pressure. The control room was reducing reactor power by inserting control rods concurrent with the changes in steam header pressure. The main steam pressure increased to the setpoint value of 1005 psig and began to modulate. Concurrent with the steam bypass operation, the feedwater inside the steam generators heated from 132F to 547F, resulting in an increase in specific volume of the steam generator water mass. This action resulted in a rapid expansion of the feed mass causing a swell and a subsequent feedwater isolation actuation from indicated high steam generator water level.

The simulation of the shutdown and low power operation had been successfully practiced prior to the plant shutdown. However, the simulator training did not accurately reflect the steam generator transient conditions experienced on the plant.

REPORTABILITY

The unplanned automatic initiation of a Feedwater Isolation signal and the resultant automatic initiation of the Auxiliary Feedwater System due to the tripping of the Main Feedwater Pumps following the Feedwater Isolation constitutes an automatic actuation of an Engineered Safety Feature (ESF) as described in 10 CFR 50.73(a)(2)(iv). This requires NRC reporting within four hours of the occurrence, pursuant to the reporting criteria of 10 CFR 50.72(b)(2)(ii), and LER reporting within 30 days of the occurrence, pursuant to the reporting criteria of 10 CFR 50.73(a)(2)(iv). At 0302 hours on September 23, 2000, a 4-hour notification (Report # 37371) was made to the NRC in accordance with 10 CFR 50.72(b)(2)(ii).

CAUSE OF EVENT

The cause was the lack of procedural clarity combined with simulation training not being consistent with actual plant response. As a result of the inadequate procedure clarity, the initial water inventory in all steam generators was inappropriately high. Also, preshutdown simulator training did not accurately model this transient.

SAFETY IMPLICATIONS

The safety significance of the feedwater isolation on 9/23/2000 was small. Steam generator inventory remained above the low water level trip throughout this event and its restoration.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Beaver Valley Power Station Unit 2	05000412	2000	- 001	- 00	4 OF 5

Feedwater isolation occurred when steam generator indicated narrow range level reached the high level setpoint of 74.6 percent. Following initiation of the automatic feedwater isolation signal, all ESF equipment responded as expected. The main feedwater isolation valves closed, the operating main feedwater pump tripped, and the motor-driven auxiliary feedwater system pumps started, as designed.

The indicated narrow range levels in all three steam generators rose to a maximum of approximately 79 percent. After the indicated steam generator water level returned to below the high level setpoint, normal feedwater flow was re-established via 2FWS-P21A and the bypass feedwater regulating valves, and auxiliary feedwater pumps were manually secured. Heat removal was maintained at all times via the condenser steam dump removal system and plant shutdown continued down to Mode 5. There were no adverse effects identified to the main steam system from the indicated high water level in the steam generators.

At the time of the BVPS Unit 2 feedwater isolation, the only out-of-service component modeled in the Unit 2 Probabilistic Risk Analysis was the B containment instrument air compressor. Additionally, the breakers associated with the fast bus transfer function had already been transferred to the off-site power supplies. Also, since the reactor power level was less than 40 percent, ATWS concerns are not postulated. Using these assumptions and setting the Total Loss of Main Feedwater Initiating Event Probability set to 1.0, the Conditional Core Damage Probability is small.

CORRECTIVE ACTIONS

1. The plant response will be reviewed to ensure simulator fidelity.
2. The station shutdown procedure will be revised to clarify the criteria on steam generator water level control.
3. Immediate actions included verifying plant equipment responded as expected, initiated actions to recover normal feedwater system operation per procedures, and Auxiliary Feedwater pumps were secured.
4. A Beaver Valley Human Performance Stand Down was initiated on September 29, 2000. The purpose of this stand down was to focus the site's attention on human performance issues for the Unit 2 refueling outage. This feedwater isolation event was included in the events and condition reports discussed.
5. Additional training will be provided on this event to shift operating crews to re-emphasize the expectations for the crew performance and to discuss lessons learned from this event.

Corrective action completion is being tracked through the corrective action program.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Beaver Valley Power Station Unit 2	05000412	2000	- 001	- 00	5 OF 5

PREVIOUS SIMILAR EVENTS

A review of the BVPS Corrective Action program documents and Licensee Event Reports found one similar event involving ESF actuation of feedwater isolation within the last four years:

LER 1-96-003, "ESF Actuation - Feedwater Isolation Due to Steam Generator Water Level Transient."