



**Duquesne Light**

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February 19, 1990  
ND3MNO:3102

Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66  
LER 91-003-00

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

Gentlemen:

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

LER 91-003-00, 10 CFR 50.73.a.2.iv, "Feedwater Isolation Due to "A" Steam Generator Level High".

Very truly yours,

T. P. Noonan  
General Manager  
Nuclear Operations

JGT/sl

Attachment

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PDR ADOCK 05000334  
S PDR

February 19, 1991

ND3MNO:3102

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1) Beaver Valley Power Station Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 3 4 1	PAGE (3) 1 OF 0 4
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TITLE (4)  
Feedwater Isolation due to "A" Steam Generator Level High

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 NAMES			DOCKET NUMBER(S)
0 1	1 9	9 1	9 1	0 0 3	0 0 0	0 2	1 9	9 1	N/A			0 5 0 0 0
												0 5 0 0 0

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)										
POWER LEVEL (10) 0 0 0	20.402(b)	20.406(c)	X	50.73(a)(2)(iv)	73.71(b)						
	20.406(a)(1)(ii)	50.36(e)(1)		50.73(a)(2)(v)	73.71(c)						
	20.406(a)(1)(iii)	50.36(e)(2)		50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	20.406(a)(1)(iv)	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)							
	20.406(a)(1)(v)	50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)							
	20.406(a)(1)(vi)	50.73(a)(2)(iii)		50.73(a)(2)(ix)							
	20.406(a)(1)(vii)	50.73(a)(2)(iv)		50.73(a)(2)(x)							

LICENSEE CONTACT FOR THIS LER (12)				TELEPHONE NUMBER			
NAME T.P. Noonan, General Manager Nuclear Operations				AREA CODE 4 1 2 6 4 3 - 1 2 5 8			

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS
D	B	A	X	X	X	X	X	X	N

SUPPLEMENTAL REPORT EXPECTED (14)	YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

On 1/19/91 with the Unit in Cold Shutdown, reactor coolant temperature was being reduced by the Residual Heat Removal (RHR) system. To increase the cooldown rate of the secondary plant, two steam dump valves were opened to the condenser which was being maintained at vacuum. Steam generator levels began trending upward. At 1346 hours, level in the "A" steam generator reached 75 percent, causing a feedwater isolation signal and closing the main feedwater containment isolation valves. Following the ESF actuation, plant operators broke condenser vacuum and opened the steam generator atmospheric steam release valves which increased steam generator pressure to atmospheric. As pressure in the steam generators increased, levels decreased. Evaluation of this event determined that the subatmospheric pressure within the steam generators caused an addition of water from the Primary Plant Demineralized Water Storage Tank (WT-TK-10) due to a flowpath through the open auxiliary feedwater throttle valves. Additionally, some "swelling" occurred as saturation conditions existed in the steam generators. The operating procedure which allows drawing a vacuum in the steam generators for cooling purposes will be revised. There were no safety implications to the public as a result of this event. Unit 1 was in Cold Shutdown with the RHR system providing core cooling.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATES TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (4)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Beaver Valley Power Station Unit 1	0500033491	—	003	—	00	2 OF 4

TEXT (if more space is required, use additional NRC Form 365A's) (17)

DESCRIPTION OF EVENT

On 1/19/91 Beaver Valley Power Station (BVPS) Unit 1 was in Cold Shutdown due to pressure boundary leakage of the Reactor Coolant System (LER 91-003-00). Operating Manual procedure 1.51.4D "STATIC S/D-COOLDOWN FROM THE HOT SHUTDOWN (MODE 4) TO THE COLD SHUTDOWN (MODE 5)" was in effect.

Reactor coolant system (RCS) temperature was being reduced by the Residual Heat Removal (RHR) system. A vacuum was being maintained in the main condenser with a backpressure of 1.2 inches of mercury (absolute). Both condensate pumps were in operation. In order to cool down the secondary side of the steam generators, two steam dump valves were opened to the condenser.

Steam generator levels then began trending upward with the increase in the "A" steam generator being more pronounced. Actions taken to stop the level increase included isolating the feedwater regulating bypass valves (the main feedwater regulating valves had been previously isolated), fully opening the steam generator blowdown throttle valves and shutting down one condensate pump. Steam generator levels continued to trend upward.

At 1346 hours, the level in the "A" steam generator reached 75 percent, causing a feedwater isolation signal (FWI). Main feedwater containment isolation valves MOV-FW-156A,B,C, stroked closed. The level increase was suspected to have been caused by valve leakby.

Immediately following the FWI actuation, plant operators broke condenser vacuum. Steam generator levels stabilized. The steam generator atmospheric steam release valves were opened to restore atmospheric pressure. As pressure in the steam generators increased, levels decreased. Steam generator blowdown was isolated to maintain a constant inventory. The stable post-event narrow range level in the "A" steam generator reflected an approximate increase of 1000 gallons from the pre-event level.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Beaver Valley Power Station Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 3 3 4 9 1	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			0 0 3	0 0	0 3	OF

TEXT (If more space is required, use additional NRC Form 386A's) (17)

CAUSE OF EVENT

An evaluation of this event has determined that the root cause of the level increase was due to the subatmospheric pressure condition created within the steam generators. A flowpath existed from the Primary Plant Demineralized Water Storage Tank (WT-TK-10) through open auxiliary feedwater throttle valves to the steam generators. Although the station shutdown procedure directs the auxiliary feedwater throttle valves to be closed in Cold Shutdown (Mode 5), at the time of the event this step had not yet been accomplished. Normally even with the auxiliary feedwater throttle valves open, the pressure head due to the inventory in WT-TK-10 is not sufficient to overcome the greater pressure head due to the higher steam generator elevation. However, as a vacuum was drawn in the steam generators, the static head existing from WT-TK-10 became sufficient to force water through the auxiliary feedwater system to the steam generators. Additionally some level increase due to swelling also occurred as saturation conditions were reached in the steam generators causing localized boiling and flashing of the water.

The vacuum in the steam generators also had the effect of reducing the static head which drives blowdown flow. This limited the effectiveness of blowdown in mitigating the level increase while the steam generators were subatmospheric. Once atmospheric pressure was established in the steam generators, blowdown was then effective at reducing steam generator level.

CORRECTIVE ACTIONS

The following corrective actions have been or will be taken as a result of this event:

1. Condenser vacuum was broken which allowed recovery of atmospheric pressure in the steam generators. As pressure within the steam generators increased, the flow of water from WT-TK-10 stopped, the swelling effect was reversed and blowdown flow increased.
2. The Station Shutdown procedure will be revised to alert operators of the effect of drawing a vacuum in the steam generators with the auxiliary feedwater throttle valves open.
3. This event will be reviewed by all licensed operators during a future retraining session.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Beaver Valley Power Station Unit 1	DOCKET NUMBER (2)  0500033491	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			003	00	04	OF 04

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

REPORTABILITY

This event was reported to the Nuclear Regulatory Commission at 1405 hours in accordance with 10CFR 50.72.b.2.ii. This written report is being submitted in accordance with 10CFR50.73.a.2.iv, as an event involving an Engineered Safety Features Actuation.

PREVIOUS OCCURENCES

There have been no previous events in which a Feedwater Isolation signal has been generated due to Hi-Hi steam generator level with the Unit in Operating Mode 5 (Cold Shutdown).

SAFETY IMPLICATIONS

There were no safety implications to the public as a result of this event. Unit 1 was in Cold Shutdown with the RHR system providing core cooling. The only components at the time to be actuated by the Feedwater Isolation Signal were the three Main Feedwater inlet containment isolation valves to the Steam Generators, which responded properly (stroked closed) to the Feedwater Isolation signals. Feedwater Isolations due to Hi-Hi Steam Generator Levels are analyzed in Beaver Valley Unit 1 Updated Final Safety Analysis Report Section 14.1.9, "Excessive Heat Removal Due to Feedwater System Malfunctions."