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May 1, 1990
ND3MNO:2060

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
LER 90-008-00

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 90-008-00, 10 CFR 50.73.a.2.iv, "Reactor Coolant System Letdown Isolation/ESF Actuation".

Very truly yours,

T P Noonan

T. P. Noonan
General Manager
Nuclear Operations

JT/sl

Attachment

IE22
1/1

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NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4)

Reactor Coolant System Letdown Isolation/ESF Actuation

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 4	0 1	9 0	9 0	— 0 0 8 —	0 0	0 5	0 1	9 0	N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 2

POWER LEVEL (10): 0 0 1

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

[ ] 20.402(b)	[ ] 20.405(c)	[X] 50.73(a)(2)(iv)	[ ] 73.71(b)
[ ] 20.405(a)(1)(i)	[ ] 50.36(c)(1)	[ ] 50.73(a)(2)(v)	[ ] 73.71(c)
[ ] 20.405(a)(1)(ii)	[ ] 50.36(c)(2)	[ ] 50.73(a)(2)(vii)	[ ] OTHER (Specify in Abstract below and in Text, NRC Form 366A)
[ ] 20.405(a)(1)(iii)	[ ] 50.73(a)(2)(i)	[ ] 50.73(a)(2)(viii)(A)	
[ ] 20.405(a)(1)(iv)	[ ] 50.73(a)(2)(ii)	[ ] 50.73(a)(2)(viii)(B)	
[ ] 20.405(a)(1)(v)	[ ] 50.73(a)(2)(iii)	[ ] 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)	
T. P. Noonan, General Manager Nuclear Operations	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 NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	S J	F C V	M 1 2 0	Y		X	C B	L C V	M 1 2 0	Y
X	J I	P D C V	C 6 3 5	Y						

SUPPLEMENTAL REPORT EXPECTED (14)

[ ] YES (If yes, complete EXPECTED SUBMISSION DATE) [X] NO

EXPECTED SUBMISSION DATE (15): MONTH | DAY | YEAR

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

On 4-1-90, with the reactor in the startup mode at approximately 1% power, erratic automatic response of condenser steam dump valve PCV-MS-106A caused the reactor coolant system (RCS) temperature to decrease below the Technical Specification minimum temperature for criticality, 541 degrees. Due to this temperature reduction, pressurizer level decreased below its low level setpoint of 14%. This caused an automatic letdown isolation to occur at 2356 hours. Operators took manual control of PCV-MS-106A and shut the valve. The reactor operator initiated manual control rod withdrawal to increase RCS temperature. The bypass feedwater regulating valves were closed to lessen the heat removal rate of the RCS to the steam generators. By 2359 hours, RCS temperature had increased to above 541 degrees and pressurizer level was restored to its normal operating range. Minimum RCS temperature during this event was 535 degrees. Steam generator levels remained within their normal operating band throughout this event. Operators attempted to restore normal letdown but were unable to open LCV-CH-460B. Excess letdown was placed into service to control pressurizer level. There were no safety implications to the public as a result of this event. The letdown isolation signal, in response to a low pressurizer water level, is designed to conserve reactor coolant system inventory.

NRC Form 366 (9-83)

DESCRIPTION OF EVENT:

At 2233 hours on 4-1-90, reactor startup was commenced in accordance with operating manual procedure 1.50.4D "REACTOR STARTUP FROM HOT STANDBY TO THE STARTUP MODE (MODE 2) (Power less than 5 percent (%))." At 2323 hours, the reactor was declared critical. Control room operators were attempting to stabilize the reactor at 2-5% power per procedure. Heat removal was accomplished through the condenser steam dump system with the controller set in automatic to maintain a main steam header pressure of 1005 psig corresponding to 547 degrees average reactor coolant system (RCS) temperature. Steam generator levels were being maintained by normal feed flow through the bypass feed regulating valves (FRV's).

Sluggish response of the bypass FRV's caused steam generator levels to rise. The increased Steam Generator inventory caused a cooldown of the RCS. The decrease in RCS temperature caused steam pressure to decrease below the condenser steam dump setpoint of 1005 psig. Condenser steam dump valve PCV-MS-106A did not fully close, causing the cooldown to continue. At 2356 hours, with PCV-MS-106A still open, RCS temperature dropped below 541 degrees, the minimum temperature for criticality per Technical Specification 3.1.1.5. The reduction in RCS temperature caused pressurizer level to decrease. As pressurizer level decreased to less than 14%, a control signal was initiated for the automatic isolation of RCS letdown. Letdown orifice isolation valves TV-CH-200 A & B and letdown path isolation valves LCV-CH-460 A & B closed as designed in response to the automatic isolation signal. TV-CH-200C was already closed, its position in normal system alignment.

The reactor operator initiated manual control rod withdrawal to increase RCS temperature. Operators took manual control of PCV-MS-106A and shut the valve. The bypass FRV's were closed to prevent the cold feedwater from further cooling the RCS. By 2359 hours, RCS temperature was restored to above 541 degrees, and pressurizer level was restored to within its normal range. The unit exited the action statement of technical specification 3.1.1.5 in less than 3 minutes after entry. Minimum RCS temperature during this event was 535 degrees. Steam generator levels remained within their normal operating range throughout this event. Operators attempted to restore normal letdown but were unable to open LCV-CH-460B. Excess letdown was placed in service per procedure to control pressurizer level.

The unit was manually shutdown to Mode 3 (Hot Standby) to investigate and repair of the control problems exhibited by the bypass FRV's, PCV-MS-106A and LCV-CH-460B. At 0102 hours, after all rods were fully inserted, the reactor trip breakers were manually opened per procedure, placing the Unit in Hot Standby (Mode 3).

Cause of Event

The failure of PCV-MS-106A to close when RCS temperature dropped below 547 degrees allowed an inadvertent shrink of pressurizer level below the 14% setpoint which initiated automatic letdown isolation. Investigation determined that the either the valve or its actuator is mechanically bound.

I&C investigation determined that the sluggish bypass FRV response was due to water in their air control system. This water was introduced during the recent instrument air dew point transient (see LER 90-007).

LCV-CH-460B failed to reopen once the letdown isolation signal cleared due to a bent valve stem which resulted in mechanical binding of the valve.

Previous Events

There have been no previous similar events at Beaver Valley Unit 1. There have been two previous events involving automatic letdown isolations at Beaver Valley Unit 2. Beaver Valley Unit 2 LER 89-001 describes an automatic letdown isolation which occurred when Instrumentation & Control inadvertently removed the controlling level channel from service during a surveillance procedure. Beaver Valley Unit 2 LER 89-022 describes an automatic letdown isolation which occurred at Unit 2 due to seat leakage on the Primary Drains High Pressure Header Isolation Valve, 2DGS-300.

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

Corrective Actions

The plant was manually shutdown and placed in Hot Standby to investigate the cause of this event. Based on this investigation, the following corrective actions have been initiated:

1) PCV-MS-106A was removed from service and isolated. A maintenance work request (MWR) was written to repair the valve. This will be performed during a future outage when the condenser is not under vacuum. A temporary modification on the condenser steam dump system control system altered the response of a second dump valve [PCV-MS-106B1] to compensate for PCV-MS-106A being isolated. A 10CFR50.59 safety evaluation was performed to document the acceptability of this alignment.

2) The I/P converters and booster relays were replaced on the bypass and main feedwater regulating valves. LER 90-007 details the corrective actions taken in response to water in the instrument air system which was the root cause for the failure of components within the main and bypass FRV's.

3) LCV-CH-460B was repaired under an MWR and returned to service. The bent valve stem was replaced.

Reportability

Since letdown orifice isolation valves TV-CH-200A & B are containment isolation valves (CIA), this written report is being submitted in accordance with 10CFR50.73.a.2.iv, as CIA valves are included as an Engineered Safety Features (ESF) System actuation.

Safety Implications

There were no safety implications to the public as a result of this event. The letdown isolation signal, in response to a low pressurizer water level is a control signal designed to prevent uncovering of the heater elements in the pressurizer and to conserve the reactor coolant system inventory for decay heat removal considerations during accident situations. No protection system actuation setpoints were approached during this event. The failure of the condenser steam dump valve to close is bounded by the analysis of the Beaver Valley Unit 1 Updated Final Safety Analysis Report (UFSAR) section 14.1.13, "Accidental Depressurization of the Main Steam System."