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August 26, 1991
ND3MNO:3179

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
LER 91-023-00

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 91-023-00, 10 CFR 50.73.a.2.iv, "Reactor Trip Due to Electro-Hydraulic Control System Malfunction".

Very truly yours,

T. P. Noonan
General Manager
Nuclear Operations

JHK/sl

Attachment

IE22
1/1

cc: Mr. T. T. Martin, Regional Administrator
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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
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 (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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Beaver Valley Power Station Unit 1	0 5 0 0 0 3 3 4	1 OF 0 3

TITLE (4)
Reactor Trip Due to Electro-Hydraulic Control System Malfunction

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 7	2 7	9 1	9 1	— 0 2 3	— 0 0	0 8	2 6	9 1	N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 3 0	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	J J	E C B D	X X X X	N							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On 7/26/91 at 1930 hours in Operating Mode 1 at 30 percent power, the unit began to experience turbine governor control oscillations from the turbine Electro-Hydraulic Control (EHC) system. Between 1930 hours 7/26/91 and 0655 hours 7/27/91, three load rejections of between 100 and 150 MWe were experienced. Operators stabilized the plant after each load rejection. EHC troubleshooting by plant personnel and contractor technicians began after the first occurrence. After the third occurrence, station management decided to remove the turbine from service in accordance with the Abnormal Operating Procedure for a load rejection. During preparations for shutdown, a fourth load rejection, accompanied by erratic turbine governor valve control, occurred. The reactor tripped at 0713 hours, due to a low level coincident with a low feedwater flow in the "B" steam generator. Control room personnel stabilized the plant in Operating Mode 3. The spurious governor valve signals were due to loose connections in the EHC system. There were no safety implications to the public as a result of this event. All shutdown and control rods inserted, and all plant systems responded as designed.

DESCRIPTION OF EVENT

On 7/26/91 at 1930 hours while in Operating Mode 1 at 30 percent power, the Unit began to experience turbine governor control oscillations from the turbine Electro-Hydraulic Control (EHC) system. The governor valve control signal fluctuated, resulting in a 100 MWe load rejection. The governor valve position limiter was reduced by the operators and the plant was stabilized. Contractor EHC technicians were contacted to assist in troubleshooting. On 7/27/91 at 0315 hours the Speed Error "A" card in the EHC cabinet was replaced.

At 0511 hours on 7/27/91, a second 150 MWe load rejection occurred when the governor valve control signal failed to zero and then returned to its original output approximately forty-five seconds later. A technician from the EHC contractor had opened the door in the EHC cabinet during this time and reclosed the cabinet door just as the load rejection was announced throughout the station. Control room personnel stabilized the plant by following Abnormal Operating Procedure (AOP) 1.35.2, "Load Rejection/Loss of Electrical Load."

A third load rejection of 150 MWe occurred at 0655 hours. Operators stabilized the plant and station management decided to remove the turbine from service in accordance with AOP for a load rejection. While preparing to shutdown the Unit, a fourth load rejection coupled with erratic turbine governor valve control, was experienced. The reactor tripped at 0713 hours, due to a low level coincident with a low feedwater flow in the "B" steam generator. Control room personnel entered Emergency Operating Procedure E-0, "Reactor Trip and Safety injection" and transitioned to procedure ES-0.1, "Reactor Trip Response" after verifying that a Safety Injection signal was not required. The plant was stabilized in Hot Standby (Operating Mode 3).

CAUSE OF THE EVENT

A contractor specializing in EH control systems was contacted to assist troubleshooting the EHC system. The technicians concluded that the governor valve closures were the result of losing the governor valve common signal GV*AZ1 on mixing amplifier 2PO2F. This amplifier is the final driver to all four governor valves. The card was found not to be fully inserted into its slot. The technician inserted the card and verified proper output. Additional wire connections and contacts were checked and tightened. The spurious governor valve signals were attributed to the loose connections found and corrected during the troubleshooting effort. After a confidence run, the reactor was taken critical on 7/27/91 at 2130 hours.

CORRECTIVE ACTIONS

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

1. Operations personnel, utilizing the Emergency Operating procedures, stabilized the plant in Hot Standby.

2. An inspection and electrical check of the EHC system by station and personnel was performed.

3. The EHC preventive maintenance program will be formalized from the series of Maintenance Work Requests currently being used. The scope of the program will be reviewed and enhancements considered where appropriate.

SAFETY IMPLICATIONS

There were no safety implications to the public as a result of this event. The plant systems responded as designed (all shutdown and control rods fully inserted, turbine trip, auxiliary feedwater actuation on low-low steam generator level following steam generator level shrink resulting from the loss of secondary load).

REPORTABILITY

This event was reported to the Nuclear Regulatory Commission at 0745 hours on 7/27/91 in accordance with the requirements of 10CFR50.72.b.2.ii, Reactor Protection System actuation. This written report is being submitted in accordance with 10CR50.72.iv, as an event involving a Reactor Protection actuation.

PREVIOUS OCCURRENCES

There has been one previously reported reactor trip which was the result of EHC system failures, LER 87-002-00 "Reactor Trip/Turbine Trip Due to Electro-Hydraulic Control Malfunction." In this event, a failure of the Overspeed Protection Controller resulted in a turbine runback when the overspeed setpoint drifted low.