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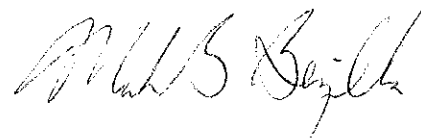
February 28, 2003

L-03-040

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412 License No. NPF-73
LER 2003-001-00United 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 2003-001-00, 10 CFR 50.73(a)(2)(i)(B), "Lag Time Constant for Steam Line Pressure Channel Used in the Reactor Protection System Found Out of Tolerance."



Mark B. Bezilla

Attachment

- c: Mr. T. G. Colburn, NRR Senior Project Manager
- Mr. D. M. Kern, Sr. Resident Inspector
- Mr. H. J. Miller, NRC Region I Administrator
- INPO Records Center (via electronic image)
- Mr. L. E. Ryan (BRP/DEP)

NRC FORM 366 (7-2001)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104	EXPIRES 7-31-2004
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 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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 No. 2	2. DOCKET NUMBER 05000412	3. PAGE 1 OF 5
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4. TITLE
Lag Time Constant For Steam Line Pressure Channel Used In The Reactor Protection System Found Out of Tolerance

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	31	2002	2003	_ 001	_ 00	02	28	2003	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)								
10. POWER LEVEL	100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)					
		<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)					
		<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 73.71(a)(4)					
		<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(5)					
		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A					
		<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)						
		<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)						
		<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)						
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)								
<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)								

12. LICENSEE CONTACT FOR THIS LER

NAME L. R. Freeland, Manager Regulatory Affairs / Performance Improvement	TELEPHONE NUMBER (Include Area Code) (724) 682-5284
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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

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

During a routine 18-month calibration of the Loop B Steamline Pressure Protection Channel used in the Reactor Protection System at Beaver Valley Power Station (BVPS) Unit No. 2 on December 31, 2002, the as-found value of the lag time constant was found to be 8.95 seconds on a lead/lag card. BVPS Unit 2 Technical Specification 3.3.2.1, Table 3.3-3, Functional Item 1.e requires that Tau 2 (lag time constant) be less than or equal to 5 seconds. Subsequent investigation found that sometime between the last calibration of this instrument channel and when this calibration was performed on this channel, the coarse time constant switch was changed from setting 5 to 6, which caused the lag time constant to be out of tolerance. There were no known activities ongoing prior to the commencement of this calibration surveillance on December 31, 2002. Since firm evidence existed that the lag time constant was known to be at a value prohibited by BVPS Unit No. 2 Technical Specifications, then Action 14 of Table 3.3-3 in Technical Specification 3.3.2.1 was not met before December 31, 2002. This constituted a condition prohibited by plant Technical Specifications and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

The cause for the lag time constant discrepancy at BVPS Unit 2 was determined to be a human performance error by an Instrument and Control Technician. The exact time and place of the occurrence could not be definitively determined. The current licensing bases analyses remained conservative even with the incorrectly set low steam pressure lead/lag. Therefore, safety significance of this event was small.

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PLANT AND SYSTEM IDENTIFICATION

Westinghouse-Pressurized Water Reactor (PWR)
Engineered Safety Features Actuation System Instrumentation (JE)

CONDITIONS PRIOR TO OCCURRENCE

Unit 2: Mode 1 at 100 % power

There were no systems, structures, or components that were inoperable that contributed to the event other than as described below.

DESCRIPTION OF EVENT

During a routine 18-month calibration of the Loop B Steamline Pressure Protection Channel used in the Reactor Protection System at Beaver Valley Power Station (BVPS) Unit No. 2 on December 31, 2002, the value of the lag time constant was found to be 8.95 seconds on a lead/lag card. BVPS Unit 2 Technical Specification 3.3.2.1, Table 3.3-3, Functional Item 1.e requires that Tau 2 (lag time constant) be less than or equal to 5 seconds. The coarse time constant switch associated with this lag function was changed from the as-found setting value of "6" to a setting value of "5" and the lag time constant was returned to a value allowed by the Technical Specification and the instrument channel was returned to service.

Subsequent investigation found that the coarse time constant switch setting associated with the lag time constant had been mispositioned prior to the start of the recent calibration. The coarse time constant switch was left on the correct setting of "5" during the last calibration of this instrument channel on August 16, 2001. However, the as-found setting on the coarse time constant switch during the recent calibration was found on a setting of "6". Altering the coarse time constant switch setting from a correct setting of "5" to a "6" setting on the coarse switch would result in the incorrect as-found lag time constant value observed on December 31, 2002. Therefore, sometime between the last calibration of this instrument channel and when the recent calibration was performed on this channel, the coarse switch was inappropriately changed from 5 to 6, which resulted in an incorrect lag time constant. This coarse switch would not normally be adjusted except during a loop calibration.

REPORTABILITY

BVPS Unit 2 Technical Specification 3.3.2.1 states that the Engineered Safety Features Actuation System (ESFAS) instrumentation channels shall be operable as shown in Table 3.3-3. The allowable value for Tau 2 of the steam line pressure instrument shall be less than or equal to 5 seconds as described in Functional Item 1.e in Table 3.3-3. The Tau 2 value was found to be 8.95 seconds, which does not comply with the Technical Specification requirements.

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REPORTABILITY (Continued)

NUREG-1022, Rev. 2, page 34 states that for 10 CFR 50.73 purposes, "it shall be assumed that the discrepancy occurred at the time of its discovery unless there is firm evidence, based upon a review of relevant information such as the cause of failure, to indicate that the discrepancy existed previously." There were no known activities ongoing immediately prior to the commencement of the recent calibration surveillance on December 31, 2002, with regard to this pressure channel. Since the lag time constant was discovered at a value which did not comply with Technical Specification requirements and it was due to an incorrect switch setting different from the value recorded during its last prior calibration, there was firm evidence that time constant discrepancy existed prior to its discovery. If a steam line pressure channel does not meet Technical Specification required values listed in Table 3.3-3, the Technical Specifications (Action 14) require that the inoperable channel be placed in the tripped condition within 6 hours. Since firm evidence existed that the lag time constant was known to be at a value prohibited by BVPS Unit No. 2 Technical Specifications, then Action 14. of Table 3.3-3 in Technical Specification 3.3.2.1 was not met before December 31, 2002. This constituted a condition prohibited by plant Technical Specifications and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). If this condition had previously existed when another steam line pressure channel was taken out of service for routine required surveillance, then it was possible that two channels were not fully operable which is also a condition prohibited by plant Technical Specifications.

CAUSE OF EVENT

The cause for the lag time constant discrepancy at BVPS Unit 2 was determined to be a human performance error by an Instrument and Control (I&C) Technician. The exact time and place of the occurrence could not be definitively determined.

An investigation was conducted and a timeline was developed for work performed on the instrument loops in question from the last time that the lead/lag card settings were verified to be set correctly. One possible time of the mis-positioning error of the coarse setting was when calibration work was performed on 2MSS-P474, Loop B Steamline Pressure Protection Channel II, on July 16 and 17 2002. A review of this work package revealed one of the adjacent cards had an "as found" setting of "6". The card was replaced and was left with a course setting of "5". Although this does not clearly indicate an error occurred during this work, there was sufficient activity in the card frame near the inappropriately set coarse switch to make this human error possible. A possible explanation for the mis-positioning is a note in the procedure, which permits the coarse time constant switch to be set to zero to accelerate output stabilization and then return the switch to the previous recorded setting. Since the switch setting was found only one position off, the technicians may have manipulated the wrong switch and the error was not found until the next calibration. Another time where the error could have occurred was during the last calibration of the subject steam line pressure channel on August 16, 2001. As the procedure was written, the I&C technicians could have successfully calibrated the first lead/lag card, verified the values left on the first card, moved on to the second

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CAUSE OF EVENT (Continued)

lead/lag card, unknowingly disturbed the first card during calibration of the second card, verified the values on the second card, and then exited the procedure.

SAFETY IMPLICATIONS

This instrument provides one out of three input signals to the safety injection actuation in the event of low steam line pressure from the B-Loop main steam line. The non-LOCA safety analyses for Beaver Valley Unit 2 assumes a 50 second lead and a 5 second lag (50/5 second lead/lag) on the low steam pressure function. A lead lag of this magnitude makes the function anticipatory in that the function will be satisfied before the condition actually reaches the setpoint. The as-found condition of a lead of 113.8 seconds and a lag of 8.95 seconds is more conservative than the analysis values of 50/5 seconds for lead/lag. Thus, had an event occurred while operating with the incorrectly set lead/lag, the low steam pressure setpoint would have been reached sooner than what is predicted in the licensing basis analyses. Therefore, the current licensing basis analyses remained conservative even with the incorrectly set low steam pressure lead/lag and no analysis limits would have been violated.

For the margin to trip analysis, the "as found" lead/lag time constants setting on the Steam Line Low Pressure function are higher than the targeted setting of 50 seconds for lead time constant and 5 seconds for the lag time constant. These setting values impact the margin to trip analysis as follows. A higher lead/lag reduces the margin to the steam line low pressure SI and MSIV actuation setpoint. The limiting normal condition transient for the margin to trip low steam line pressure ESF actuation setpoint is the 10% step load increase transient. Based on the results (rate of steam pressure decrease) of these analyses and the full power nominal steam pressure of 810 psig, the minimum steam line pressure would still remain above the nominal trip setpoint of 500 psig for the "as found" lead/lag setting of 113.8/8.95. A change in the lead/lag from the targeted 50/5 to 113.8/8.95 results in a reduction of approximately 100 psi margin. Although the margin to trip would be reduced by the "as found" lead/lag setting, it would still not challenge the relevant trip setpoint from normal condition operating transients as stated above.

Thus, the current licensing basis analyses remained conservative even with the incorrectly set low steam pressure lead/lag and no analysis limits would have been violated and the limiting normal condition margin to trip analysis results would still remain above the nominal trip setpoint of 500 psig.

The subject steam line pressure channel provides one out of three input signals to the safety injection (SI) actuation in the event of low steam line pressure from the B-Loop main steam line. Since the other two instruments would continue to provide 2/3 input signals, a SI would still be actuated in the event of a steam line break. Both Beaver Valley Power Station Units' Probabilistic Risk Assessments (PRAs) do not explicitly model these instruments. Therefore, the out of tolerance on one channel will have no direct impact to the PRA Core Damage Frequency (CDF) or Large Early Release Frequency

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SAFETY IMPLICATIONS (Continued)

(LERF). The probability of having more than one instrument channel not working is considered low and the impact to the PRA would still be considered insignificant.

Based on the above, the safety significance of this event was small.

CORRECTIVE ACTIONS

1. The surveillance calibration procedure involved with this event and eight other associated procedures will be revised to add a verification step near the end of the procedure that verifies that the lead/lag cards are left with the correct settings. Currently the procedure verifies the settings on the first instrument card following calibration and then proceeds to a second card. This change will add a barrier to detect if the first card is accidentally altered during work on a second card.
2. This event will be reviewed with the I&C technicians in a formal classroom setting in small groups as a case study. The presentation will focus on procedure adherence and human performance. The objectives of the class will be to demonstrate the areas for improvement and what tools can be used to improve performance.

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

PREVIOUS SIMILAR EVENTS

A review of past Beaver Valley Power Station Licensee Event Reports for the last three years found two similar events involving human performance errors regarding instrumentation at BVPS Unit 1 or Unit 2.

BVPS Unit 1 LER 00-004, "Inadvertent ESF Actuation Due to Loss of Power to 4kv Emergency Bus."

BVPS Unit 2 LER 02-002, "Tagout Reduces Ability of Emergency Diesel Generator to Respond to Loss of Offsite Power."

ATTACHMENT

Beaver Valley Power Station, Unit No. 2
License Event Report 2003-001-00

Commitment List

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 in this document. Any other actions discussed in the submittal represent intended or planned actions by Beaver Valley. These other actions are described only as information and are not regulatory commitments. Please notify Mr. Larry R. Freeland, Manager, Regulatory Affairs/Corrective Actions, at Beaver Valley on (724) 682-5284 of any questions regarding this document or associated regulatory commitments.

Commitment

Due Date

The surveillance calibration procedure involved with this event and eight other associated procedures will be revised to add a verification step near the end of the procedure that verifies that the lead/lag cards are left with the correct settings

As tracked through the Corrective Action Program.

This event will be reviewed with the I&C technicians in a formal classroom setting in small groups as a case study.

As tracked through the Corrective Action Program.