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August 19, 1999
L-99-130

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412 License No. NPF-73
LER 99-008-00

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 99-008-00, 10 CFR 50.73(a)(2)(i), "Failure to Comply with Technical Specifications Due to Not Meeting SR 4.8.1.1.2.f, Simultaneous Start Test of Emergency Diesel Generators."

K. L. Ostrowski

K. L. Ostrowski
Division Vice President
Nuclear Operations and
Plant Manager

Attachment

IE22

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NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

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TITLE (4)
Failure to Comply with Technical Specifications Due to Not Meeting SR 4.8.1.1.2.f, Simultaneous Start Test of Emergency Diesel Generators

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
									None	
07	22	99	99	008	00	08	19	99	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	5
POWER LEVEL (10)	0 %

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

20.2201(b)	20.2203(a)(2)(v)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)
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)	50.73(a)(2)(iv)	OTHER 10CFR21
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	TELEPHONE NUMBER (Include Area Code)
R. D. Hart, Senior Licensing Supervisor	(412) 393-5284

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

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

On 7/23/99, during an industry operating experience review, a system engineer identified that BV-2 Surveillance Requirement (SR) 4.8.1.1.2.f was not fully verified during the last surveillance test performed on 9/1/96. BV-2 TS SR 4.8.1.1.2.f demonstrates diesel generator independence by starting both diesel generators simultaneously from a standby condition and verifying that each diesel generator achieves voltage and frequency within the specified ranges in </= to 10 seconds. This SR is required to be performed at least once per 10 years or after any modifications which could affect diesel generator interdependence. Both the 2-1 and 2-2 BV-2 EDGs had previously been declared inoperable on 7/19/99 and 7/14/99, respectively, due to unrelated concerns (See BV-2 LERs 50-412/99-006 and 50-412/99-007). Since both BV-2 EDGs were inoperable, the unit was already in Mode 5 with the action statement for TS 3.8.1.2 in effect. On 8/12/99, it was determined that SR 4.8.1.1.2.f was not properly satisfied at the time of initial startup of BV-2 in 1987. At the time of initial plant startup a pre-operational test was apparently credited as meeting the SR. While the test did demonstrate that both EDGs started simultaneously, the test did not verify that the EDGs accelerated to at least 514 rpm in </= to 10 seconds, which was the SR 4.8.1.1.2.f requirement at the time. The initial entry into Mode 5 during the initial plant startup in 1987 and all mode escalations until 7/23/99, without full compliance to SR 4.8.1.1.2.f was a condition prohibited by SR 4.0.4. Therefore, this event constitutes a condition and operation prohibited by TS and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). The apparent cause of the inadequate test on 9/1/96 was human error. The cause of the inadequate verification of SR 4.8.1.1.2.f in 1987 cannot be determined due to the extended time since the event. SR 4.8.1.1.2.f was satisfied by the performance of a revised surveillance test on 7/23/99.

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse Pressurized Water Reactor (PWR)
Emergency Diesel Generators (EDG) {EK}*

* Energy Industry Identification System (EIIS) system and component function identifier codes appear in the text as {SS/CCCC}

CONDITIONS PRIOR TO EVENT

Unit 2: Mode 5 at 0% power

Both of the Beaver Valley Power Station, Unit 2 (BV-2) Emergency Diesel Generators (EDGs) {EK} (2-1 and 2-2) had previously been declared inoperable on July 19, 1999, and July 14, 1999, respectively, due to concerns unrelated to this event (See BV-2 LERs 50-412/99-006 and 50-412/99-007 for more information). Since both EDG trains were inoperable, BV-2 was in Mode 5 at 0% power, with the action statement for Technical Specification (TS) 3.8.1.2 in effect.

DESCRIPTION OF EVENT

On July 22, 1999, at approximately 0600 hours, during an industry operating experience review of Duane Arnold Energy Center (DAEC) LER 50-331/1999-002, a system engineer identified that a similar concern was applicable to BV-2. Specifically, the system engineer identified that BV-2 TS Surveillance Requirement (SR) 4.8.1.1.2.f was not fully verified during the last surveillance test performed on September 1, 1996. Upon identification of the concern, the system engineer initiated Condition Report 991798 to enter the problem into the corrective action program. Both the 2-1 and 2-2 BV-2 EDGs had previously been declared inoperable on July 19, 1999, and July 14, 1999, respectively, due to unrelated concerns (See BV-2 LERs 50-412/99-006 and 50-412/99-007 for more information). Since both BV-2 EDGs were inoperable, the unit was already in Mode 5 with the action statement for TS 3.8.1.2 in effect. Upon review of Condition Report 991798, the Nuclear Shift Supervisor (NSS) logged both EDGs as inoperable due to the problem identified.

BV-2 TS SR 4.8.1.1.2.f demonstrates diesel generator independence by starting both diesel generators simultaneously from a standby condition and verifying that each diesel generator achieves in </= 10 seconds, voltage >/= 3994 volts and </= 4368 volts, and frequency >/= 58.8 Hz and </= 61.2 Hz. This SR is required to be performed at least once per 10 years or after any modifications, which could affect diesel generator interdependence. When the surveillance test was last performed on September 1, 1996, the time for each diesel generator to reach a frequency of 60 Hz was verified to be </= 10 seconds, after a simultaneous start of both EDGs from a standby condition. In addition, the steady state EDG voltage and frequency was verified to be within the required ranges for each EDG. However, the surveillance test failed to verify that the EDG voltage was within the required range in </= 10 seconds for each EDG.

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DESCRIPTION OF EVENT (Continued)

On August 12, 1999, during the investigation of this event, it was determined that SR 4.8.1.1.2.f was not properly satisfied at the time of initial startup of BV-2 in 1987. On May 15, 1987, the simultaneous start of both EDGs was performed as part of pre-operational test PO 2.36B.02. The acceptance criterion for this portion of the test was that both EDGs started simultaneously and was based on Regulatory Guide 1.108, Section C.2.b. At the time of initial plant startup in 1987, SR 4.8.1.1.2.f stated "At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 514 rpm in </= to 10 seconds." SR 4.0.4 prohibits entry into an operational mode unless the surveillance requirements associated with a limiting condition for operation have been performed within the stated surveillance interval or as otherwise specified. At the time of initial plant startup, pre-operational test PO 2.36B.02 was apparently credited as meeting SR 4.8.1.1.2.f. While the test did demonstrate that both EDGs started simultaneously, the test did not verify that the EDGs accelerated to at least 514 rpm in </= to 10 seconds. Condition Report 992037 was initiated on August 12, 1999, to document this condition in the corrective action program.

ANALYSIS OF THE EVENT

SR 4.8.1.1.2.f is required to be performed at least once per 10 years or after any modification which could affect diesel generator interdependence, and requires both EDGs to be started simultaneously and the output of each EDG be within the specified voltage and frequency ranges in </= to 10 seconds. Prior to April 1996, SR 4.8.1.1.2.f required verification that both EDGs accelerated to at least 514 rpm in </= to 10 seconds. The purpose for this type of test is to demonstrate that EDG starting independence has not been compromised.

SR 4.8.1.1.2.f was not properly satisfied from the time of initial plant startup in 1987 until July 23, 1999. At the time of initial plant startup, pre-operational test PO 2.36B.02 was apparently credited as meeting SR 4.8.1.1.2.f. While the test did demonstrate that both EDGs started simultaneously, the test did not verify that the EDGs accelerated to at least 514 rpm in </= to 10 seconds. The surveillance test performed on September 1, 1996, was deficient in that it did not verify that the required voltage range was achieved in </= to 10 seconds. However, it did adequately demonstrate that both EDGs were able to be started simultaneously and achieve the required frequency in </= to 10 seconds, and that the steady state voltage and frequency were within the required ranges. No modifications which could affect diesel generator interdependence have been made on the EDGs since initial plant operation. Although SR 4.8.1.1.2.f was not met until July 23, 1999, both the pre-operational test and the September 1, 1996 test did demonstrate that both EDGs were able to be started simultaneously. These tests effectively demonstrated that no common mode failure existed, which would have prevented the simultaneous start of both EDGs during an emergency or valid start signal.

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ANALYSIS OF THE EVENT (Continued)

A prior opportunity to identify the deficient surveillance test occurred in February of 1998 when the procedure (2BVT 1.36.2) that implements SR 4.8.1.1.2.f was reviewed as part of the Technical Specification Surveillance Procedure Review (TSSPR) effort. This review concluded that 2BVT 1.36.2 would satisfy the SR since the procedure contained the correct voltage and frequency acceptance criteria as well as a verification that both EDGs started in </= to 10 seconds. The reviewer assumed that the voltage and frequency criteria were verified during the timing step. However, in actual performance of the procedure, the voltage and frequency criteria were verified at steady state operation. A review of completed procedures to determine the actual method of performance was not within the scope of the TSSPR effort. The TSSPR review utilized different reviewers for the review of the surveillance requirements at each unit, and then had the opposite unit's reviewer cross check the other reviewer's conclusions. Since Unit 2 SR 4.8.1.1.2.f has no corresponding surveillance requirement at Unit 1, a cross check review of the reviewer's conclusions was not performed. A review of Unit 1 and Unit 2 surveillance requirements with a frequency greater than or equal to 5 years (60 months) was performed to identify any other similar occurrences of a long term surveillance requirement at one unit without a corresponding surveillance requirement at the other unit. This review identified Unit 2 SR 4.8.1.1.2.g as meeting this criteria. This SR requires the main fuel oil storage tank for each EDG to be cleaned at least once per ten years, and was satisfactorily performed during its last surveillance interval.

CAUSE OF THE EVENT

The apparent cause of the inadequate surveillance in 1996 was human error. When the surveillance test (2BVT 1.36.2) was developed in 1996 to meet SR 4.8.1.1.2.f, the system engineer who prepared the test had a mindset or preconceived idea that the timing method used in the monthly EDG surveillance test was adequate to verify the surveillance requirement. With this mindset, the system engineer used the EDG's monthly surveillance tests (2OST-36.1 & 2OST-36.2) for the simultaneous start of the EDGs in 2BVT 1.36.2. The system engineer failed to verify that this method fully met the requirements of SR 4.8.1.1.2.f.

The cause of the inadequate verification of SR 4.8.1.1.2.f in 1987 cannot be determined due to the extended time and personnel changes since the event.

CORRECTIVE ACTIONS

1. Technical Specification and Safety Culture Training has been conducted for applicable station staff members, which included system engineering personnel. Technical Specification Training was completed by April 30, 1998, and was given to baseline the staff's understanding of technical specifications, including management expectations for full compliance. Safety Culture Training was completed by July 31, 1999, and was given to foster a questioning attitude. Note that the system engineer who identified this problem is the same person who developed surveillance test 2BVT 1.36.2 in 1996. This system engineer credited the lessons learned from Technical Specification and Safety Culture Training in the identification of the problem at BV-2 during a review of industry operating experience.

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CORRECTIVE ACTIONS (continued)

1. The surveillance test (2BVT 1.36.2) for satisfying SR 4.8.1.1.2.f was revised on July 23, 1999, to measure and record the times for each EDG to achieve the minimum voltage and minimum frequency acceptance criteria as well as the steady state voltage and frequency readings. 2BVT 1.36.2 was satisfactorily performed on July 23, 1999, and demonstrated that both EDGs simultaneously started and achieved the minimum voltage and frequency in </= 10 seconds and that the steady state voltage and frequency were within the specified limits.

REPORTABILITY

BV-2 TS SR 4.8.1.1.2.f requires that both diesel generators be started simultaneously from a standby condition at least once per 10 years or after any modifications, which could affect diesel generator interdependence, and verification that each diesel generator achieves in </= 10 seconds, voltage >/= 3994 volts and </= 4368 volts, and frequency >/= 58.8 Hz and </= 61.2 Hz. Prior to April 1996, SR 4.8.1.1.2.f required verification that both EDGs accelerated to at least 514 rpm in </= to 10 seconds. SR 4.8.1.1.2.f was not properly satisfied from the time of initial plant startup in 1987 until July 23, 1999. SR 4.0.4 prohibits entry into an operational mode unless the surveillance requirements associated with a limiting condition for operation has been performed within the stated surveillance interval or as otherwise specified. The initial entry into Mode 5 during the initial plant startup in 1987 and all mode escalations until July 23, 1999, without full compliance to SR 4.8.1.1.2.f was a condition prohibited by SR 4.0.4. Therefore, this event constitutes a condition and operation prohibited by TS and is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

The surveillance test performed on September 1, 1996, did not adequately verify that the output voltage of each EDG was within the specified range in </= 10 seconds. Since this test did not verify all the requirements of SR 4.8.1.1.2.f it is considered as invalid.

SAFETY IMPLICATIONS

Both the pre-operational test and September 1, 1996 surveillance test did not comply with the requirements of SR 4.8.1.1.2.f. However, both of these tests did effectively demonstrate that no common mode failure existed, which would have prevented the simultaneous start of both EDGs during an emergency or valid start signal and, therefore, met Regulatory Guide 1.108, Section C.2.b. The successful performance of the July 23, 1999 surveillance test satisfied SR 4.8.1.1.2.f. Since no modifications have been made to the EDGs which would have affected their independence, the July 23, 1999 test results provide assurance that the EDGs were capable of meeting this SR in the past. In addition, EDG operability is routinely demonstrated by the monthly and 18 month EDG surveillance requirements. Based on this information, there were minimal implications to the health and safety of the public as a result of this event.

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PREVIOUS SIMILAR EVENTS

A review of BVPS Licensee Event Reports (LER) for the past three years that involved an operation or condition prohibited by Technical Specifications related to the emergency diesel generators identified the following events:

BVPS Unit 1 LER 98-007, "Failure to Inspect Diesel Generators in Accordance with Technical Specifications."

BVPS Unit 1 LER 98-008, "Failure to Test Emergency Diesel Generator Trip Bypass in Accordance with Technical specifications."

BVPS Unit 1 LER 98-019, "Routine Technical Specification Surveillance of Swing Load Interlocks for EDG Loading Not Performed and Failure to Comply with TS Action Statement When Identified."

BVPS Unit 1 LER 97-002, "Emergency Diesel Generator Watt Meter Inaccuracy Results in Inadequate Technical Specification Surveillance Test."

BVPS Unit 1 LER 97-014, "Failure to Check for and Remove Accumulated Water in the Emergency Diesel Generator Day Tanks as Required by Technical Specifications."

BVPS Unit 1 LER 97-030, "Failure to Comply with Emergency Diesel Generator Technical Specification Action Statement."

BVPS Unit 1 LER 97-031, "Inadequate Testing of the Engineered Safety Feature Function, Loss of Power - 4.16kV Bus, Loss of Voltage (Start Diesel)."

BVPS Unit 2 LER 98-002, "Inadequate Testing of Diesel Fuel Oil Transfer Pumps as Required by Technical Specifications."