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January 20, 1997
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Beaver Valley Power Station, Unit No. 2
Docket No. 50-412 License No. NPF-73
LER 96-009-00

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 96-009-00, 10 CFR 50.73(a)(2)(i), "Missed Technical Specification Surveillance Test - Quadrant Power Tilt Ratio Manual Calculation."

R. L. LeGrand
Division Vice President
Nuclear Operations

LB/ds

Attachment

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LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1) Beaver Valley Power Station Unit 2									DOCKET NUMBER (2) 05000412			PAGE (3) 1 OF 4			
TITLE Missed Technical Specification Surveillance Test - Quadrant Power Tilt Ratio Manual Calculation															
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 Beaver Valley Power Station Unit 1			DOCKET NUMBER 05000334			
12	20	96	96	009	00	01	20	97	N/A						
OPERATING MODE (9)		1		20.402(b)			20.405(c)			50.73(a)(2)(iv)			73.71(b)		
POWER LEVEL (10)		66%		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		
				20.405(a)(1)(iii)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)(A)			(Specify in abstract below and in Text NRC Form 366A)		
				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 R. L. LeGrand, Vice President Nuclear Operations and Plant Manager									TELEPHONE NUMBER (include Area Code) (412) 393-7622						
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					
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
YES (if yes, complete EXPECTED SUBMISSION DATE)				X NO											

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

On December 20, 1996, at approximately 2200 hours, with Beaver Valley Power Station (BVPS) Unit 2 in Mode 1 at 66% power, it was identified during a review by the Nuclear Shift Supervisor (NSS) that a surveillance test required by plant Technical Specifications (TS), Surveillance Requirement 4.2.4a, the manual calculation of the Quadrant Power Tilt Ratio (QPTR), had not been performed within the prescribed surveillance interval. At 2215 hours, when the required manual QPTR calculation was satisfactorily completed, approximately 16 hours and 40 minutes had elapsed since the last required performance of the surveillance, or about 1 hour and 40 minutes greater than the allowable surveillance interval.

Unit 2 TS Surveillance Requirement 4.0.3 states that failure to perform a Surveillance Requirement within the allowed surveillance interval, which is the specified time interval with a maximum allowable extension not to exceed 25% of the surveillance interval, shall constitute a noncompliance with the operability requirements for the Limiting Condition for Operation (LCO). This is a condition prohibited by the plant's Technical Specifications and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i).

The root causes of this event were determined to be inadequate procedures and misunderstood verbal communications.

The required QPTR manual calculation was performed at 2215 hours and every 12 hours thereafter until no longer required by TS. Follow-up corrective actions for this event include: 1) lessons learned and the need to conform to Operating Standards were shared with the operators involved in this event, 2) plant startup and load follow (power escalation) procedures were revised to ensure consistency with Technical Specification requirements, 3) "Conduct of Operations," procedures were revised to delete "signatures and initials" requirements more appropriately addressed by Operating Standards, 4) Operating Standards will be strengthened to include additional requirements for procedural signoffs, and 5) results of the root cause investigation for this event will be disseminated to all Unit 1 and Unit 2 Operations personnel via required reading. There were no automatically or manually initiated safety system responses as a result of this event.

The QPTR calculations performed on December 20, 1996, at 0535 hours and 2215 hours, demonstrated that the QPTR did not exceed the TS LCO 3.2.4 limit of 1.02. In addition, a flux map performed on December 21, 1996 did not identify any off normal conditions for the reactor core. Based upon this, there were no implications to the health and safety of the public as a result of this event.

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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)

Reactor Excore Instrumentation System - IG*

Quadrant Power Tilt Ratio (QPTR) Alarm, NIS POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT Annunciator A4-5H {IG/ALM}*
Power Range Nuclear Instrumentation Detector Channels N43 and N44 {IG/DET}*
Power Range Detector Current Comparator {IG/comparator}*
* Energy Industry Identification System (EIIS) plant system and component codes are identified in the text as {EIIS:SS/CC}.**CONDITIONS PRIOR TO OCCURRENCE**

Unit 1: Mode 1, 100% Reactor Power

Unit 2: Mode 1, 66% Reactor Power

DESCRIPTION OF THE EVENT

On December 20, 1996, at approximately 2200 hours, with Beaver Valley Power Station (BVPS) Unit 2 in Mode 1 at 66% power, it was identified during a review by the Nuclear Shift Supervisor (NSS) that a surveillance test required by plant Technical Specifications (TS), Surveillance Requirement 4.2.4a, the manual calculation of the Quadrant Power Tilt Ratio (QPTR), had not been performed within the prescribed surveillance interval. At 2215 hours, when the required manual QPTR calculation was satisfactorily completed, approximately 16 hours and 40 minutes had elapsed since the last required performance of the surveillance, or about 1 hour and 40 minutes greater than the allowable surveillance interval.

There were no automatically or manually initiated safety system responses as a result of this event.

CAUSE OF THE EVENT

The root causes of this event were determined to be inadequate procedures and misunderstood verbal communications.

ANALYSIS OF THE EVENT

Unit 2 Operating Manual (OM) procedure 2OM-52.4A, "Increasing Power from 5% Reactor Power and Turbine on Turning Gear to Full Load Operation," step 141.a requires the performance of operating surveillance test (OST) 2OST-2.4A, Quadrant Power Tilt Ratio Manual Calculation," prior to exceeding 50 percent of rated thermal power, to verify that the Technical Specification (TS) Limiting Condition for Operation (LCO) of QPTR ≤ 1.02 is met. Procedure 2OM-52.4A, step 141.b, also requires the performance of 2OST-2.4, "QPTR Alarm Check," once reactor power is >50 percent, unless it has been performed within the previous 31 days.

On December 20, 1996, at 0535 hours, a manual QPTR calculation was completed satisfactorily, in accordance with 2OM-52.4A and 2OST-2.4A and power escalation from 50 percent to 74 percent reactor power began. During shift turnover between the midnight and daylight operating crews, which occurred between 0600 and 0700 hours, procedure 2OM-52.4A was not reviewed by the Assistant Nuclear Shift Supervisor (ANSS). Subsequently, when reviewing 2OM-52.4A, step 141.b, a Nuclear Control Operator (NCO) asked the ANSS whether the "QPTR OST" had been completed.

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The ANSS then reviewed the status of 2OST-2.4A [QPTR Manual Calculation] and replied that 2OST-2.4A was completed satisfactorily. The NCO misinterpreted this to mean that step 141.b of 2OM-52.4A, which requires the performance of 2OST-2.4, "QPTR Alarm Check," had been completed. Consequently, step 141.b was signed off by the NCO as completed. Since the QPTR Alarm Check surveillance was not performed when required to verify operability of the alarm, the alarm was technically inoperable. In accordance with Technical Specification Surveillance Requirement 4.2.4a, the QPTR is required to be verified to be within the limit once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable. Therefore, in accordance with TS, a manual QPTR calculation should have been performed at 1735 hours, or 12 hours after the 0535 performance of the test. A root cause of this error was identified as "Misunderstood Verbal Communications, Standard Terminology Not Used."

At 2022 hours, the upper section of Power Range Nuclear Instrumentation Detector Channel N44 {EIIS:IG/DET} was defeated to the Detector Current Comparator {EIIS:IG/Comparator} to clear the QPTR Alarm, NIS POWER RANGE HIGH/LOW SP FLUX DEVIATION/AUTO DEFEAT Annunciator A4-5H {EIIS:IG/ALM}. Since this renders the QPTR alarm inoperable, the Nuclear Shift Supervisor determined at that time that manual QPTR calculations were required every 12 hours, while this input was defeated. At 2215 hours, a manual QPTR calculation per 2OST-2.4A was satisfactorily completed when it was identified that 2OST-2.4 "QPTR Alarm Check," had not been performed following escalation to >50 percent power.

Procedure 2OM-52.4A was found to be inconsistent with the requirements of TS 3.2.4. Specifically:

- TS 3.2.4 requires that "the QPTR shall be less than or equal to 1.02." This is applicable in Mode 1, >50 percent power.
- TS 4.0.4 states that "entry into an operational mode or other specified condition shall not be made unless the Surveillance Requirements associated with a limiting condition for operation have been performed within the stated surveillance interval."
- TS 4.2.4a requires that the QPTR be verified within the limit by calculation:
 1. Once per 7 days with the QPTR alarm operable.
 2. Once within 12 hours and every 12 hours thereafter with the QPTR alarm inoperable.

In order to satisfy the above requirements, the following must be accomplished:

1. Verify the QPTR is within limits prior to exceeding 50 percent rated thermal power. 2OM-52.4A, step 141.a properly satisfies this requirement.
2. Establish a surveillance interval for the QPTR calculation (12 hours or 7 days). 2OM-52.4A, step 141.b does not establish any time frame beyond 50 percent power in which the QPTR alarm must be verified operable (assuming that 2OST-2.4 had not been completed within the last 31 days). Step 141.b of 2OM-52.4A states "Once reactor power is >50 percent, perform 2OST-2.4, 'QPTR Alarm Check,' unless it has been performed within the previous 31 days." Thus the plant procedure allows the QPTR alarm check to be performed beyond the 12 hour surveillance window for a manual QPTR calculation after exceeding 50 percent power.

The root cause of this deficiency has been identified as "Procedure Inadequate."

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CORRECTIVE ACTIONS

The QPTR manual calculation was performed for Unit 2 at 2215 hours December 20, 1996 and every 12 hours thereafter until no longer required by TS.

Unit 1 plant startup operating procedures were reviewed by December 31, 1996, for applicability to this event. It was identified that procedure 1OM-52.4A also failed to establish a 12 hour time limit in which the QPTR alarm check or QPTR manual calculation needs to be completed after exceeding 50 percent power. Additionally, it was identified that this procedure does not require a QPTR calculation prior to exceeding 50 percent power. Procedure changes were implemented to correct this on January 9, 1997. A review of the last two Unit 1 startups was conducted by December 31, 1996. The review showed that the required QPTR calculations were performed within the allowed surveillance interval.

A review of both Unit 1 and Unit 2 plant startup procedures (1/2OM-52.4A) was completed December 31, 1996, to verify that the Axial Flux Difference (AFD) TS requirements were properly reflected in these procedures. In particular, AFD surveillances are specified prior to exceeding 15 percent, 50 percent, and 90 percent power, in accordance with TS 3/4.2.1. No deficiencies were identified.

Follow-up corrective actions for this event include: 1) lessons learned and the need to conform to Operating Standards were shared with the operators involved in this event on December 31, 1996, 2) Unit 1 and 2 plant startup and load follow procedures "Increasing Power from 5% Reactor Power and Turbine on Turning Gear to Full Load Operation," 1/2OM-52.4A, and "Load Following," 1/2OM-52.4B were revised January 9, 1997, to ensure consistency with Technical Specification requirements, 3) "Conduct of Operations," procedure 1/2OM-48.1D was revised January 9, 1997, to delete signatures and initials requirements more appropriately addressed by Operating Standards, 4) Operating Standards will be strengthened to include additional requirements for procedural signoffs by February 2, 1997, and 5) results of the root cause investigation for this event will be disseminated to all Unit 1 and Unit 2 Operations personnel via required reading by February 28, 1997.

REPORTABILITY

Unit 2 Technical Specification Surveillance Requirement 4.0.3 states that failure to perform a Surveillance Requirement within the allowed surveillance interval, which is the specified time interval with a maximum allowable extension not to exceed 25% of the surveillance interval, shall constitute a noncompliance with the operability requirements for the Limiting Condition for Operation (LCO). This is a condition prohibited by the plant's Technical Specifications and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i).

SAFETY IMPLICATIONS

The QPTR calculations performed on December 20, 1996, at 0535 hours and 2215 hours demonstrated that the QPTR did not exceed the TS LCO 3.2.4 limit of 1.02. In addition, a flux map performed on December 21, 1996 did not identify any off normal conditions for the reactor core. Based upon this, there were no implications to the health and safety of the public as a result of this event.

SIMILAR EVENTS

A review of Licensee Event Reports for the past two years identified LER 95-005-00, "Missed Surveillance - Quadrant Power Tilt Ratio Calculation Not Performed," which documented a weekly manual QPTR calculation which was not performed due to a human performance error by a Reactor Operator. A review of the root cause and corrective actions revealed that the current event is not related to the missed surveillance in 1995. Additionally, it was determined that the corrective actions for the 1995 event would not have prevented the missed QPTR surveillance on December 20, 1996.