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L-97-003

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334 License No. DPR-66
LER 97-001-03

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 97-001-03, 10 CFR 50.73(a)(2)(i), "Generic Letter 96-01 Inadequate Surveillance Testing of Safety Related Logic Circuits."

Ronald L. LeGrand

R. L. LeGrand

Attachment

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DELIVERING QUALITY ENERGY

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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1): Beaver Valley Power Station Unit 1

DOCKET NUMBER (2): 05000334

PAGE (3): 1 OF 12

TITLE: Generic Letter 96-01 Inadequate Surveillance Testing of Safety Related Logic Circuits

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
07	17	97	97	001	03	08	14	97	Beaver Valley Power Station Unit 2	05000412
									N/A	

OPERATING MODE (9)	5	20.402(b)		20.405(c)		50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	000	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	TELEPHONE NUMBER (Include Area Code)
R. L. LeGrand, Vice President Nuclear Operations and Plant Manager	(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)

As a result of reviews being performed in response to Generic Letter 96-01, "Testing of Safety Related Logic Circuits," the following conditions have been discovered and determined to be reportable pursuant to the requirements of 10CFR50.73(a)(2)(i).

1. On February 13, 1997, at approximately 1706 hours, with Beaver Valley Power Station (BVPS) Unit 1 at 100% reactor power, it was identified that the monthly Operational Surveillance Tests (OSTs) which verify operability of the Control Room Emergency Ventilation Subsystem do not contain adequate acceptance criteria. The OSTs were subsequently revised and were performed on February 18, 1997, at which time operability of the affected emergency ventilation subsystem was verified. The details of this condition are found on pages 2 and 3 of this report.

2. On April 2, 1997, at approximately 1500 hours, with Beaver Valley Power Station Unit 1 in Mode 5 at 0% power, it was identified that the OST which tests the Engineered Safety Feature (ESF) auto start circuitry of the Auxiliary Feedwater (AFW) pumps tests only one of two control switch parallel paths. The OST was subsequently revised and operability of the AFW pump autostart circuitry was verified by performance of the OST on April 6, 1997. The details of this condition are found on page 5 of this report.

3. On April 10, 1997, at approximately 1500 hours with Beaver Valley Power Station Unit 1 in Mode 5 at 0% power, it was identified that the Engineered Safety Feature Actuation System (ESFAS) P-11 interlock function of enabling/disabling automatic actuation of the pressurizer power operated relief valves (PORVs) was not completely tested by existing surveillance procedures. The details of this condition are found on page 7 of this report.

4. On July 7, 1997, at approximately 0930 hours, with BVPS Units 1 and 2 in Mode 5 at 0% reactor power, it was identified that portions of the wiring for the Overtemperature Delta T Reactor Trip System Instrumentation Function were not tested by existing surveillance procedures. This condition was identified at both Units. Additional testing was performed at both Units to address this. The details of this condition are found on page 10 of this report.

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Beaver Valley Power Station Unit 1	05000334	97	001	03	2 OF 12

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse Pressurized Water Reactor (PWR)

Control Room Emergency Habitability System {VI}

Control Room Emergency Ventilation Subsystem {VI}

Control Room Emergency Ventilation Subsystem heaters VS-E-13A and VS-E-13B {VI/EHTR}

Control Room Emergency Ventilation Subsystem filters VS-FL-1, 2 and 3 {VI/FLT}

* Energy Industry Identification System (EIIS) codes and component function identifier codes appear in the text as (SS/CCC).

CONDITION PRIOR TO OCCURRENCE

Unit 1: Mode 1, 100% Reactor Power
Unit 2: Mode 1, 100% Reactor Power

DESCRIPTION OF EVENT

On February 13, 1997, at approximately 1700 hours, with Beaver Valley Power Station Unit 1 at 100% reactor power, it was identified that the monthly Operational Surveillance Tests (OSTs) 1OST-44A.02, "Control Room Ventilation System Test - Train A," and 1OST-44A.03, "Control Room Ventilation System Test - Train B," which verify operability of the Control Room Emergency Ventilation Subsystem {VI} do not contain adequate acceptance criteria. Failure to adequately demonstrate the operability of the Control Room Emergency Ventilation Subsystem {VI} is a condition prohibited by Technical Specifications and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i). This was identified during the performance of reviews in response to Generic Letter 96-01, "Testing of Safety-Related Logic Circuits." Specifically, the OSTs performed to satisfy the surveillance requirements of the Technical Specifications (TS) for the Control Room Habitability System {VI} do not include verification of the operation of the Control Room Emergency Ventilation Subsystem heaters VS-E-13A and VS-E-13B {VI/EHTR} as a part of the TS acceptance criteria. Operation of the electric heaters is necessary to ensure that relative humidity of the influent airstream is maintained at ≤70%, to reduce the buildup of moisture on the charcoal adsorbers and HEPA filters, so that the required decontamination efficiency can be achieved during accident conditions. There were no automatically or manually initiated safety system responses as a result of this event.

Control Room Emergency Ventilation Subsystem heaters VS-E-13A and VS-E-13B and associated filter bank VS-FL-1, 2 and 3 were determined to be inoperable in accordance with TS requirements on February 13, 1997, at 1819 hours. This action rendered one of the three emergency ventilation subsystems of the Control Room Emergency Habitability System for the combined Unit 1 and Unit 2 Control Room inoperable. However, the other two emergency ventilation subsystems remained fully operable. Since the Unit 1 Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.7.1 requires two out of three emergency ventilation subsystems to be operable, no entry into a TS action statement was required.

CAUSE OF EVENT

The cause of this event was the inadequate development of safety related logic testing procedures for the Control Room Emergency Ventilation Subsystem. This process failed to identify the need to include testing of the heaters as a part of the monthly TS surveillance test acceptance criteria to verify operability of the Control Room Emergency Ventilation Subsystem.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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Beaver Valley Power Station Unit 1	05000334	97	001	03	3 OF 12

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

ANALYSIS OF EVENT

Unit 1 TS Surveillance Requirement 4.7.7.1.1 requires the emergency ventilation subsystem to be demonstrated operable at least once per 31 days by initiating flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for 15 minutes. To adequately verify that the train operates for 15 minutes, the operation of the respective emergency ventilation subsystem electric heater(s) must be verified. That is, VS-E-13A and VS-E-13B for the Unit 1 subsystem must be verified to be operating. The Unit 1 TS do not explicitly require verification of heater operability; however, the heaters are part of the train.

Review of Licensing documents shows that heater operation is necessary to justify the charcoal adsorber decontamination efficiency (95%) used in the BVPS accident analysis for control room habitability. This decontamination efficiency is based on using assigned decontamination efficiencies for activated carbon contained in Regulatory Guide 1.52 (Rev. 2), Section C.6 and Table 2. BVPS Unit 1 committed to meeting these applicable sections of Regulatory Guide 1.52 (Rev. 2) regarding activated carbon testing in submittals to the NRC related to Unit 1 Technical Specification Amendment No. 109; the amendment for the common Unit 1 and Unit 2 control room, which included Unit 1 Technical Specification 3/4.7.7 "Control Room Emergency Habitability Systems." One of the requirements of the Regulatory Guide for using the 95% decontamination efficiency is maintaining the air stream to the charcoal adsorber at ≤70% relative humidity. Operation of the electric heaters, VS-E-13A and VS-E-13B, is necessary to ensure the relative humidity is controlled at ≤70% during an accident. Without maintaining the relative humidity at ≤70% during an accident, the respective control room emergency ventilation subsystem may not be capable of performing its safety function to ensure GDC 19 is met for design basis accidents which impact control room habitability.

Monthly Operational Surveillance Tests (OSTs) 1OST-44A.02, "Control Room Ventilation System Test - Train A," and 1OST-44A.03, "Control Room Ventilation System Test - Train B," do not include verifying heater operation as a part of the acceptance criteria. The OSTs do verify a local red indicating light for each heater, labeled "Heater Energized," but not as part of the acceptance criteria. Review of applicable engineering drawings, however, shows that the red indicating lights can be illuminated without the associated heater being energized. Therefore, this is not an acceptable method to verify heater operation. An existing 18 month performance test, 1BVT 01.44.02, measures the KW output of the heaters and verifies that the heat dissipation of each heater is within a specific tolerance.

Analogous testing of the BVPS Unit 2 heaters was addressed in a previous Licensee Event Report supplement, LER 2-96-003-01, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic Circuits," dated January 24, 1997.

CORRECTIVE ACTIONS

1. Control Room Emergency Ventilation Subsystem heaters VS-E-13A and VS-E-13B and associated filter bank VS-FL-1, 2 and 3 {VI/FLT} were determined inoperable by failing to meet the requirements of TS 4.7.7.1.1.b on February 13, 1997, at 1819 hours.
2. Operational Surveillance Tests (OSTs) 1OST-44A.02 and 1OST-44A.03 were revised by System Engineering on February 14, 1997, and approved for use February 17, 1997. The calculated temperature rise across the heaters is included in the new acceptance criteria used to verify operability for Control Room Emergency Ventilation Subsystem heaters VS-E-13A and VS-E-13B.
3. Revised tests 1OST-44A.02 and 1OST-44A.03 were performed on February 18, 1997, and operability of the affected emergency ventilation subsystem was verified.
4. Surveillance testing of safety-related ventilation system heaters for both units has been reviewed and determined to adequately address the TS requirements.
5. In accordance with the Duquesne Light Company response to NRC Generic Letter 96-01 entitled "Testing of Safety-Related Logic Circuits," a comprehensive validation of Unit 1 and Unit 2 surveillance procedures with regard to satisfying logic testing

requirements of safety related logic circuits is being performed. These reviews will be completed as specified in our commitment response.

REPORTABILITY

The Unit 1 Technical Specification Definition 1.6, "OPERABLE-OPERABILITY" states, "A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electric power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their safety related function(s)." Therefore, the operation of the control room emergency ventilation subsystem heaters must be verified during the monthly OSTs for Surveillance Requirements. Since the above operability was not verified, the inadequacy of the surveillance procedures precluded the satisfactory demonstration of control room emergency ventilation subsystem operability. This represents a condition prohibited by TS and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i).

SAFETY IMPLICATIONS

One of the three emergency ventilation subsystems of the Control Room Emergency Habitability System for the combined Unit 1 and Unit 2 Control Room was declared inoperable as a result of the identified inadequate verification of heater operability. However, the other two emergency ventilation subsystems remained fully operable. Since the Unit 1 Technical Specification TS) Limiting Condition for Operation (LCO) 3.7.7.1 requires two out of three emergency ventilation subsystems to be operable, no entry into a TS action statement was required.

As discussed, heater operability is required to maintain the humidity of the supply ventilation ≤70% under accident conditions, to maintain the efficiency of the charcoal adsorbers and thereby support Control Room habitability. Unit 1 Emergency Ventilation Subsystem supply heaters were verified to be operable via new test criteria on February 18, 1997. This testing has demonstrated that there was no loss of heater operability. An 18 month preventive maintenance test which measures heater voltage and current has demonstrated heater heat dissipation performance on that frequency. In addition, periodic in-place and laboratory testing of the charcoal adsorber banks and HEPA filters has demonstrated that these components have satisfied the applicable TS surveillance requirements and have remained operable. Based on this information, there were no safety implications to the health and safety of the public as a result of this event.

SIMILAR EVENTS

There were eight similar events during the last two years regarding inadequate testing of safety related logic:

1. LER 1-96-004-00, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated April 24, 1996.
2. LER 1-96-006-00, "Inadequate Testing of Safety Injection Relays," dated May 15, 1996.
3. LER 1-96-004-01, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated July 8, 1996.
4. LER 1-96-004-02, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated August 6, 1996.
5. LER 1-96-004-03, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated September 6, 1996.
6. LER 1-96-004-04, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated December 20, 1996.
7. LER 2-96-003-00, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic," dated July 8, 1996.

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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)

Auxiliary Feedwater Pumps 1FW-P-3A and 3B {SJ/P}

Main Feedwater Pumps FW-P-1A and 1B {SJ/P}

* Energy Industry Identification System (EIIS) codes and component function identifier codes appear in the text as (SS/CCC).

CONDITION PRIOR TO OCCURRENCE

Unit 1: Mode 5, 0% Reactor Power
Unit 2: Mode 1, 100% Reactor Power

DESCRIPTION OF EVENT

On April 2, 1997, at approximately 1500 hours, with Beaver Valley Power Station Unit 1 in Mode 5 at 0% power, it was identified that the Operating Surveillance Test (OST), 1OST-24.6, "Auxiliary Feed Pumps Auto Start Test," which tests the Engineered Safety Feature (ESF) auto start circuitry of the Auxiliary Feedwater (AFW) pumps tests only one of two control switch parallel paths. 1-OST-24.6 tests the ESF auto start circuitry for the AFW pumps 1FW-P-3A and 3B {SJ/P} by tripping an overcurrent relay on the last running Main Feed Water (MFW) pump FW-P-1A and 1B {SJ/P} during shutdown. Contacts from the control switches for each MFW pump are parallel to each other in the auto-start circuit for the AFW pumps. Tripping the last running MFW pump during plant shutdown only tests one of the two control switch parallel paths. Failure to adequately demonstrate the operability of the Engineered Safety Feature Actuation System Instrumentation is a condition prohibited by Technical Specifications and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i). This was identified during the performance of reviews in response to Generic Letter 96-01, "Testing of Safety-Related Logic Circuits."

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

CAUSE OF EVENT

The cause of this event was the inadequate development of safety related logic testing procedures for the Auxiliary Feedwater System. This process failed to identify the need to include testing of both control switch parallel paths in the ESF auto start circuitry for the AFW pumps.

ANALYSIS OF EVENT

Unit 1 Technical Specification (TS) Surveillance Requirement 4.3.2.1.1 requires each engineered safety feature actuation system instrumentation channel to be demonstrated operable by the performance of the channel check, channel calibration, and channel functional test operations during the mode and at the frequencies shown in Table 4.3-2. Table 4.3-2, item 7.e requires a channel functional test of the AFW pump auto start ESF feature via trip of the MFW pumps on a refueling interval in Modes 1, 2 and 3. A channel functional test is the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify operability including alarm and/or trip functions. Current channel functional testing of the AFW auto start ESF feature on MFW pump shutdown is inadequate because it only tests one of two AFW pump control switch parallel paths.

The analogous ESF test at Unit 2 is adequate, since both of the parallel paths are tested.

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

CORRECTIVE ACTIONS

1. 1OST-24.6 was revised on April 5, 1997, to include testing of both AFW pump control switch parallel paths.

2. Operability of the AFW pump autostart circuitry was verified by performance of 1OST-24.6 on April 6, 1997.

3. In accordance with the Duquesne Light Company response to NRC Generic Letter 96-01 entitled "Testing of Safety-Related Logic Circuits," a comprehensive validation of Unit 1 and Unit 2 surveillance procedures with regard to satisfying logic testing requirements of safety related logic circuits is being performed. These reviews will be completed as specified in our commitment response.

REPORTABILITY

Failure to adequately demonstrate the operability of the Engineered Safety Feature Actuation System Instrumentation is a condition prohibited by Technical Specifications and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i).

SAFETY IMPLICATIONS

Both AFW pump control switch parallel paths were demonstrated to be fully functional. There was no loss of safety function. Based on this information, there were no safety implications to the health and safety of the public as a result of this event.

SIMILAR EVENTS

There were nine similar events during the last two years regarding inadequate testing of safety related logic:

1. LER 1-96-004-00, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated April 24, 1996.

2. LER 1-96-006-00, "Inadequate Testing of Safety Injection Relays," dated May 15, 1996.

3. LER 1-96-004-01, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated July 8, 1996.

4. LER 1-96-004-02, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated August 6, 1996.

5. LER 1-96-004-03, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated September 6, 1996.

6. LER 1-96-004-04, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated December 20, 1996.

7. LER 2-96-003-00, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic," dated July 8, 1996.

8. LER 2-96-003-01, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic Circuits," dated January 24, 1997.

9. LER 1-97-001-00, "Generic Letter 96-01 Inadequate Surveillance Testing of Control Room Emergency Ventilation Subsystem Heaters," dated March 10, 1997.

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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)

Solid State Protection System {JE}

Engineered Safety Features Action System {JE}

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

CONDITION PRIOR TO OCCURRENCE

Unit 1: Mode 5, 0% Reactor Power
Unit 2: Mode 1, 100% Reactor Power

DESCRIPTION OF EVENT

On April 10, 1997, at 1500 hours with Beaver Valley Power Station Unit 1 in Mode 5 at 0% power, it was identified that the Engineered Safety Feature Actuation System (ESFAS) {JE} P-11 interlock function of enabling/disabling automatic actuation of the pressurizer power operated relief valves (PORVs) was not completely tested by existing surveillance procedures. Specifically, the output contacts from slave relay K628 in the Solid State Protection System (SSPS) {JE} which provide the enabling/disabling of the automatic actuation of the pressurizer PORVs was not tested.

The Unit 1 Technical Specification (TS) Table 3.3-3, "Engineered Safety Feature Actuation System Instrumentation," includes item 8.b., ESF INTERLOCKS - Pressurizer Pressure, P-11. The TS BASES Section 3/4.3.1 and 3/4.3.2, "PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION" identifies the functions performed by the ESFAS P-11 interlock. This includes: (above P-11) enabling auto actuation of the pressurizer PORVs and (below P-11) automatically disabling auto actuation of the pressurizer PORVs, unless the Reactor Vessel Over Pressure Protection System is in service. Without testing the output contacts of SSPS slave relay K628 associated with the PORV automatic actuation circuitry, the functionality of this particular P-11 function was not adequately verified. Since Unit 1 was in Mode 5 at the time the condition was discovered, no immediate Limiting Condition for Operation (LCO) action statements were applicable.

It was also determined that Unit 2 was not affected by this event. The Unit 2 ESFAS P-11 interlock functions do not include enabling/disabling the Unit 2 pressurizer PORV automatic actuation circuitry. Therefore, no corrective action was required at Unit 2.

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

CAUSE OF EVENT

The cause of this event was the inadequate development of surveillance procedures. In the development of the Technical Specification Surveillance Requirement (TSSR) test procedures for the ESF Interlock P-11 functions (TSSR 4.3.2.1.1, Table 4.3-2, Item 8.b.) complete testing of the enabling/disabling of the auto actuation of the pressurizer PORVs was not included.

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

ANALYSIS OF EVENT

Unit 1 TSSR 4.3.2.1.1 requires each ESFAS instrumentation channel to be demonstrated operable by the performance of the channel check, channel calibration and channel functional test operations during the modes and at the frequencies shown in Table 4.3-2. Table 4.3-2, Item 8.b, "ESF INTERLOCKS, P-11," requires a channel functional test on a quarterly frequency and a channel calibration test on a refueling frequency in Modes 1, 2 or 3. The surveillance tests which perform these TSSRs do not test the output contacts from slave relay K628, in the SSPS, which provide enabling/disabling of the automatic actuation of the pressurizer PORVs, based on the status of the ESFAS P-11 interlock. This ESFAS P-11 interlock function is listed in the Unit 1 TS Bases Section 3/4.3.1 and 3/4.3.2, "PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION". However, this specific function of the P-11 interlock is not a separate TS ESFAS channel function.

CORRECTIVE ACTIONS

1. Temporary Operating Procedure 1TOP-97-11 was developed, approved and used on April 11, 1997 to test the K628 relay output contacts in the auto actuation circuit for the pressurizer PORVs. The relay contacts were determined to be operating properly.

2. Operating Manual Change Requests were written on April 23, 1997 to revise Operating Surveillance Tests to include routine testing of the K628 relay output contacts associated with the P-11 interlock function of enabling/disabling auto actuation of the pressurizer PORVs. Appropriate procedure changes were scheduled to be completed prior to the next quarterly performance of TSSR 4.3.2.1.1, Item 8.b. which was due on July 11, 1997. The procedure changes were completed by June 6, 1997.

3. In accordance with the Duquesne Light Company response to NRC Generic Letter 96-01 entitled "Testing of Safety-Related Logic Circuits," a comprehensive validation of Unit 1 and Unit 2 surveillance procedures with regard to satisfying logic testing requirements of safety related logic circuits is being performed. These reviews will be completed as specified in our commitment response.

REPORTABILITY

This event is being reported as a failure to adequately demonstrate the operability of the ESFAS Instrumentation, a condition prohibited by Technical Specifications, pursuant to the requirements of 10 CFR 50.73(a) (2) (i).

SAFETY IMPLICATIONS

The ESFAS P-11 interlock function of enabling/disabling the auto actuation of the pressurizer PORVs was demonstrated to be operable by the additional testing performed in procedure 1TOP-97-11 on April 11, 1997 with Unit 1 still in Mode 5. There was no loss of ESFAS interlock function. Based on this information, there were no safety implications to the health and safety of the public as a result of this event.

SIMILAR EVENTS

There were ten similar events during the last two years regarding inadequate testing of safety related logic:

1. LER 1-96-004-00, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated April 24, 1996.

2. LER 1-96-006-00, "Inadequate Testing of Safety Injection Relays," dated May 15, 1996.

3. LER 1-96-004-01, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated July 8, 1996.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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4. LER 1-96-004-02, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated August 6, 1996.

5. LER 1-96-004-03, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated September 6, 1996.

6. LER 1-96-004-04, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated December 20, 1996.

7. LER 2-96-003-00, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic," dated July 8, 1996.

8. LER 2-96-003-01, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic Circuits," dated January 24, 1997.

9. LER 1-97-001-00, "Generic Letter 96-01 Inadequate Surveillance Testing of Control Room Emergency Ventilation Subsystem Heaters," dated March 10, 1997.

10. LER 1-97-001-01, "Generic Letter 96-01 Inadequate Surveillance Testing of Auxiliary Feedwater Pump Auto Start Circuitry", dated May 2, 1997.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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Beaver Valley Power Station Unit 1	05000334	97	001	03	10 OF 12

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse Pressurized Water Reactor (PWR)
Reactor Trip System (RTS) {JC}*
Excore Nuclear Instrumentation System (NIS) {IG}*
Power Range Neutron Flux Detectors {IG/DET}*

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

CONDITION PRIOR TO OCCURRENCE

Unit 1: Mode 5, 0% Reactor Power
Unit 2: Mode 5, 0% Reactor Power

DESCRIPTION OF EVENT

On July 17, 1997, at approximately 0930 hours, with the Beaver Valley Power Station (BVPS) Units 1 and 2 in Mode 5 and 0% reactor power, reviews for NRC Generic Letter 96-01: "Testing of Safety-Related Logic Circuits" identified that portions of the wiring that are part of the Unit 1 Overtemperature Delta T Reactor Trip System (RTS) {JC} Instrumentation Function were not being tested during the periodic surveillance performed for the channel calibration testing of this function. It was also identified that the corresponding wiring for the Unit 2 Overtemperature Delta T RTS Function was not being tested during the Unit 2 Surveillance for the channel calibration testing of this function. The Technical Specification Surveillance Requirements (TSSR) not being adequately met for channel calibration testing were TSSR 4.3.1.1.1, Table 4.3-1, Item 7, Overtemperature Delta T, for both Units.

The Generic Letter 96-01 reviews being performed for Unit 1 identified portions of wiring in the Excore Nuclear Instrumentation System (NIS) {IG} power range neutron flux detectors' {IG/DET} signal path, which are inputs to both the Overtemperature Delta T and Overpower Delta T RTS Instrumentation Functions and were not being verified as functional by the existing channel calibration surveillance testing for these two functions. The calibration testing is performed at a frequency of at least once every 18 months. Both RTS Instrumentation Functions provide variable reactor trip setpoints which are continuously calculated based on the value of a number of input variables as defined in an equation in each Unit's Technical Specification Table 2.2-1. Both RTS Instrumentation Functions initiate a reactor trip on a 2 of 3 channel coincidence logic. One of the inputs is a neutron flux signal from three of the four excore power range neutron flux detectors. Each power range neutron flux detector provides two signals corresponding to the neutron flux in the upper and in the lower sections of a reactor core quadrant. The difference in the neutron flux between the upper and lower sections of each power range detector provides a measure of axial power imbalance which is used to limit the Overtemperature Delta T setpoint at both Units. The neutron flux values are also input to the Overpower Delta T RTS function at both Units; however, in accordance with the equation in Technical Specification Table 2.2-1 for each Unit the neutron flux values are not used to adjust the Overpower Delta T setpoints. Additionally, the Overpower Delta T RTS function cannot be affected by the inputs from the power range neutron flux detectors regardless of their values or failure modes. Therefore, it is not necessary to test this wiring to verify the functionality of the Overpower Delta T RTS function at either Unit.

The wiring which was not being functionally verified in each NIS channel included wiring from the output of an individual isolation amplifier for each upper flux and lower flux signal (generically designated NM306 for the upper flux signal and NM307 for the lower flux signal) in the Nuclear Instrumentation Rack (RK-NUC-INS) to a test toggle switch for each upper flux and lower flux signal located in the Primary Process Racks. The wiring involved consisted of three sections for each upper and lower flux signal path: a length of wire in RK-NUC-INS from the output of each isolation amplifier to a terminal board, a length of wire from the terminal board in the RK-NUS-INS located in the control room to a terminal board in the Primary Process Rack located in the Service Building at Elevation 713 feet, and a length of wire from the Primary Process Rack terminal board to the test toggle switch.

The extent of the wiring not functionally tested at Unit 2, was nearly identical. It included a length of wiring internal to the Nuclear Instrumentation Rack (RK-2NUC-INS) from the output of isolation amplifiers NM-306 and NM-307, respectively, to a terminal block; and a second length of wiring from the terminal block in RK-2NUC-INS located in the control room to a terminal block in the Primary Process Control Panel located in the control building at elevation 707 feet. All applicable wiring internal to the Primary Process Control Panel was being functionally verified at Unit 2.

Failure to verify the functionality of this wiring at both Units 1 and 2 constituted a failure to adequately meet the requirements of Technical Specification 3.3.1.1, "Reactor Trip System Instrumentation" at both Units 1 and 2 and constituted a failure to meet the Limiting Conditions of Operation for the Overtemperature Delta T RTS Instrumentation function. Since this RTS function is only required in Modes 1 and 2 and both Units were in Mode 5 when this condition was identified, no specific immediate action was required. In accordance with the Technical Specifications a restriction on entering Mode 2 at each Unit was established until this condition was corrected at that Unit.

Condition Report 971224 was written to document the identification of this event.

CAUSE OF THE EVENT

The apparent cause of this event at both Units was the inadequate development of surveillance procedures for the channel calibration testing of the Overtemperature Delta T RTS Instrumentation Function.

At both Units the procedures used to perform the testing of this RTS Instrumentation function lacked sufficient overlap testing to test all the wiring that is part of this function.

ANALYSIS OF EVENT

The TSSR 4.3.1.1.1 for both Units 1 and 2 requires each reactor trip system instrumentation channel to be demonstrated operable by the performance of the channel check, channel calibration and channel functional test operations during the modes and at the frequencies shown in their respective Technical Specification Table 4.3-1. Table 4.3-1, item 7 for both Units requires a channel calibration of the Overtemperature Delta T function at least once every 18 months in Modes 1 and 2. A channel calibration shall encompass the entire channel including the sensor and alarm and/or trip functions. It may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

At both Units the existing surveillance procedures did not contain sufficient overlap testing to functionally verify a portion of the wiring for the Overtemperature Delta T function. Therefore, the operability of the entire channel was not verified at either Unit.

CORRECTIVE ACTIONS

1. Maintenance Work Requests (MWR) 064442, 064443 and 064444 were written to test the wiring not tested by existing surveillance procedures at Unit 1. MWRs 064456, 064457 and 064458 were written to test the wiring not tested by existing surveillance procedures at Unit 2. Following the successful completion of this testing, the respective Unit Nuclear Shift Supervisor operationally accepted the associated equipment on July 23, 1997, at Unit 1 and on July 20, 1997, at Unit 2. Each Unit was still in Mode 5 at the time of operational acceptance.

2. Existing surveillance procedures were revised at both Units [Maintenance Surveillance Procedures (MSP) 1MSP-2.03-I, 1MSP-2.04-I and 1MSP-2.05-I at Unit 1 and 2MSP-2.03-I, 2MSP-2.04-I and 2MSP-2.05-I at Unit 2] to incorporate the testing of the wiring in question during the regular performances of the channel calibration testing for the Overtemperature Delta T RTS Instrumentation function. These procedure revisions were completed by July 25, 1997.

3. In accordance with the Duquesne Light Company response to NRC Generic Letter 96-01 entitled "Testing of Safety-Related Logic Circuits," a comprehensive validation of Unit 1 and Unit 2 surveillance procedures with regard to satisfying logic testing requirements of safety related logic circuits is being performed. These reviews will be completed as specified in our commitment response.

REPORTABILITY

Failure to adequately demonstrate the operability of all the wiring associated with the Overtemperature Delta T Reactor Trip System Instrumentation is a condition prohibited by Technical Specifications and is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i) at both Units.

Safety Implications

Additional testing at Units 1 and 2 demonstrated the wiring not previously tested by existing surveillance procedures to be fully functional. There was no loss of safety function. Based on this information, there were no safety implications to the health and safety of the public as a result of this event.

SIMILAR EVENTS

There were eleven similar events during the last two years regarding inadequate testing of safety related logic:

1. LER 1-96-004-00, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated April 24, 1996.
2. LER 1-96-006-00, "Inadequate Testing of Safety Injection Relays," dated May 15, 1996.
3. LER 1-96-004-01, "Generic Letter 96-01 Incorrect Test Frequency of Safety Related Logic," dated July 8, 1996.
4. LER 1-96-004-02, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated August 6, 1996.
5. LER 1-96-004-03, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated September 6, 1996.
6. LER 1-96-004-04, "Generic Letter 96-01 Incorrect Testing of Safety Related Logic Circuits," dated December 20, 1996.
7. LER 2-96-003-00, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic," dated July 8, 1996.
8. LER 2-96-003-01, "Generic Letter 96-01 Inadequate Testing of Safety Related Logic Circuits," dated January 24, 1997.
9. LER 1-97-001-00, "Generic Letter 96-01 Inadequate Surveillance Testing of Control Room Emergency Ventilation Subsystem Heaters," dated March 10, 1997.
10. LER 1-97-001-01, "Generic Letter 96-01 Inadequate Surveillance Testing of Auxiliary Feedwater Pump Auto Start Circuitry", dated May 2, 1997.
11. LER 1-97-001-02, "Generic Letter 96-01 Inadequate Surveillance Testing of Engineered Safety Feature P-11 Interlock Function," dated May 7, 1997.