

# Duquesne Light Company

Beaver Valley Power Station  
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June 9, 1997  
NPD1VPO:0700

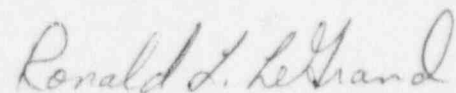
*Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334 License No. DPR-66  
LER 97-011-00*

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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 97-011-00, 10 CFR 50.73(a)(2)(i), "Inadequate Testing of Unit 1 Solid State Protection System Relays K630A and K630B."



R. L. LeGrand

DGS/ds

Attachment

9706160355 970609  
PDR ADOCK 05000334  
S PDR



160051



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**LICENSEE EVENT REPORT (LER)**

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

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.

FACILITY NAME (1) Beaver Valley Power Station Unit 1		DOCKET NUMBER (2) 05000334	PAGE (3) 1 OF 5
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TITLE  
Inadequate Testing of Unit 1 Solid State Protection System Relays K630A and K630B

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
05	09	97	97	011	00	06	09	97	Beaver Valley Power Station Unit 2	05000412
OPERATING MODE (9)		1	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)	
POWER LEVEL (10)		100%	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)(ii)		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
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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)

YES (if yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limited to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On May 9, 1997, at approximately 1600 hours with both Units 1 and 2 in Mode 1 at 100% power, it was determined that the Operations Surveillance Procedure (OST) used to perform Post Maintenance Test on August 12, 1996, for the Unit 1 Solid State Protection System (SSPS) relays K630A and K630B failed to verify the operability of contacts 1-2 of these relays. These relays are actuated on a Unit 1 chlorine detection signal to initiate control room emergency habitability system functions for the Unit 1 and 2 common control room. Failure to verify relay contact 1-2 operability implies a consequent failure to verify operability of the Control Room Emergency Bottled Air Pressurization System (CREBAPS) bottles. The bottles are designed to actuate upon a Unit 1 chlorine detection signal by relay contact 1-2 with either respective CREBAPS control transfer switch, TRS-VS-01 for Train "A" or TRS-VS-02 for Train "B", in the "Unit 1" position. The "Unit 1" position is the Normal System Arrangement. The control circuitry for the CREBAPS bottles can be powered from either Unit 1 or Unit 2.

Unit 1 Technical Specification (TS) 3.7.7.1.b and Unit 2 TS 3.7.7.b require five bottled air pressurization subsystems consisting of two bottles per subsystem to be OPERABLE. Relays K630A and K630B were operationally accepted on August 12, 1996, following the inadequate OST. This implies that any time both CREBAPS control transfer switches TRS-VS-01 and TRS-VS-02 were in the "Unit 1" position during the period August 12, 1996, to May 9, 1997, prior to additional relay testing being performed, all five bottled air pressurization subsystems should have been considered inoperable. Additional testing on May 9, 1997, was begun by 1640 hours and was completed by 2100 hours that verified the operability of contacts 1-2 for relays K630A and K630B.

Failure to either comply with Unit 1 TS 3.7.7.1.b, Unit 2 TS 3.7.7.b or the associated ACTION STATEMENTS is an operation or condition prohibited by TS and is reportable pursuant to the requirements of 10 CFR 50.73(a)(2)(i). There were no automatically or manually initiated safety system responses as a result of this event.

The apparent cause of this event was an inadequate procedure. The approved surveillance procedure used for these relays was itself inadequate to perform its stated function, thereby lacking adequate acceptance criteria to ensure the Operability of all required functions of these relays. Based on the testing performed on May 9, 1997, that verified the operability of contacts 1-2 for relays K630A and K630B, there were no safety 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 VERIFICATION**

- Westinghouse Pressurized Water Reactor (PWR)
- Solid State Protection System {JE}\*
- Solid State Protection (SSPS) Relays K630A and K630B {JE/RLY}\*
- Control Room Emergency Bottled Air Pressurization System (CREBAPS) {VI}\*
- Control Room Emergency Habitability System {VI}\*
- Control Room Unit 1 Normal Air Intake Dampers {VI/DMP}\*
- Control Room Unit 1 Normal Air Exhaust Dampers {VI/DMP}\*

\* Energy Industry Identification System (EII) 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 May 9, 1997, at approximately 1600 hours while determining the required Post Maintenance Testing (PMT) following modifications to solenoid operated valves (SOVs) that supply air to bladders for the control room Unit 1 normal air intake dampers {VI/DMP} and the control room Unit 1 normal air exhaust dampers {VI/DMP} for the BVPS common control room, it was determined that the Operations Surveillance Procedure (OST) performed on August 12, 1996, for the Unit 1 Solid State Protection System (SSPS) {JE} relays K630A {JE/RLY} and K630B {JE/RLY} failed to verify the operability of contacts 1-2 of these relays. These relays are actuated on a Unit 1 chlorine detection signal to initiate control room emergency habitability system {VI} functions for the Unit 1 and 2 common control room. Earlier that day a question was raised concerning the adequacy of the last routine performance of the procedure that was also used to perform the OST on August 12, 1996, Operational Surveillance Test (OST) 1/2OST-44A.15. Review of this question determined that the acceptance criteria for procedure 1/2OST-44A.15 was inadequate to ensure the Operability of all required functions of these relays; however, the review also confirmed that the last routine performance of 1/2OST-44A.15 on March 14, 1996, as performed, did verify all the required functions of these relays. Upon further review, it was determined that the performance of the OST on August 12, 1996, was inadequate.

The stated purpose of procedure 1/2OST-44A.15, "Chlorine Actuation by Unit 1 SSPS of Control Room Isolation/CREBAPS Systems," was to verify the response of the Control Room Emergency Habitability System for Units 1 and 2 from a Unit 1 chlorine actuation signal initiated by Unit 1 slave relays K630A and K630B. These relays each perform two primary functions upon receipt of a Unit 1 chlorine detection signal. As indicated by the procedure title, these functions are control room isolation (by closing the control room Unit 1 and Unit 2 normal ventilation dampers - both intake and exhaust) and Control Room Emergency Bottled Air Pressurization System (CREBAPS) {VI} bottle actuation. Each relay uses two contact pairs 1-2 and 3-4 to initiate these functions. The acceptance criteria in 1/2OST-44A.15, however, only verifies one of these functions - CREBAPS bottle actuation. Therefore, the acceptance criteria are inadequate to fully verify relay K630A and K630B operability. The position of the CREBAPS transfer control switches, TRS-VS-01 for Train "A" and TRS-VS-02 for Train "B" determines which relay contacts actuate the CREBAPS bottles. With the control switch in the "Unit 1" position, relay contact 1-2 actuates the CREBAPS bottles; while in the "Unit 2" position relay contact 3-4 performs this function. Therefore, the acceptance criteria in 1/2OST-44A.15 will verify the operability of one contact pair (i.e., contact 1-2 if tested in the "Unit 1"

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switch position or contact 3-4 if tested in "Unit 2" switch position), but not of both contact pairs. For the relay contact not actuating the CREBAPS bottles (based on the CREBAPS transfer control switch position), its operability can be determined by verifying control room damper closure. Relay contact 1-2 initiates closure of the control room Unit 1 dampers, while relay contact 3-4 initiates closure of the control room Unit 2 dampers. Data on the control room damper positions is recorded in the OST, but verification of damper closure is not part of the acceptance criteria and the dampers are not required to be open at the start of the OST. Therefore, depending on the plant configuration at the time of the test, adequate data in damper closure may or may not be obtained from 1/2OST-44A.15.

The OST performed on August 12, 1996, was with the CREBAPS control transfer switches, TRS-VS-01 for Train "A" and TRS-VS-02 for Train "B", placed in the "Unit 2" position as required by the procedure at the time. While the OST was performed, the plant configuration included control room Unit 1 normal air intake dampers (VS-D-40-1A and VS-D-40-1B) and control room Unit 1 normal air exhaust dampers (VS-D-40-1C and VS-D-40-1D) for the common control room in the closed position with their power removed. This is a condition (i.e., dampers closed with power removed) allowed by both Unit 1 TS LCO 3.7.7.1.c. and Unit 2 TS LCO 3.7.7.c., but it is not the Normal System Arrangement (NSA). Therefore, performance of 1/2OST-44A.15, as written, and with the plant configuration during the OST did verify relay contact 3-4 operability, but failed to verify the operability of contacts 1-2 for relays K630A and K630B. Failure to verify relay contact 1-2 operability implies a consequent failure to verify operability of the Control Room Emergency Bottled Air Pressurization System (CREBAPS) bottles. The bottles are designed to actuate upon a Unit 1 chlorine detection signal by relay contact 1-2 with either respective CREBAPS control transfer switch, TRS-VS-01 for Train "A" and TRS-VS-02 for Train "B", in the "Unit 1" position. The "Unit 1" position is the Normal System Arrangement (NSA). The control circuitry for the CREBAPS bottles can be powered from either Unit 1 or Unit 2. Normally, the CREBAPS control transfer switches would be in the "Unit 1" position unless the corresponding Unit 1 Solid State Protection System train was unavailable.

Unit 1 Technical Specification (TS) 3.7.7.1.b and Unit 2 TS 3.7.7.b require five bottled air pressurization subsystems consisting of two bottles per subsystem to be OPERABLE. Relays K630A and K630B were operationally accepted on August 12, 1996, following the inadequate OST. This implies that any time both CREBAPS control transfer switches TRS-VS-01 and TRS-VS-02 were in the Unit 1 position during the period August 12, 1996, to May 9, 1997, all five bottled air pressurization subsystems should have been considered inoperable. TS 3.0.3 should have been entered at both Units 1 and 2 any time both CREBAPS control transfer switches TRS-VS-01 and TRS-VS-02 were placed in the Unit 1 position following the operational acceptance of the relays. Based on a review of station records, it is estimated that both control transfer switches were in their NSA "Unit 1" position 86% of the time during the period August 12, 1996, through May 9, 1997. This is a condition prohibited by TS.

Following the identification of the inadequate OST on May 9, 1997, at approximately 1600 hours, efforts were immediately initiated to complete additional testing of the K630A and K630B relays. Additional testing was initiated using procedure 1/2OST-44A.15 at 1640 hours. The CREBAPS bottle headers were isolated at 1745 hours and remained isolated until all CREBAPS bottles were restored to OPERABLE at 2035 hours. The TS allows the bottles to be isolated for up to 8 hours for performance of instrumentation and control systems testing. The additional testing which successfully verified the relay contacts 1-2 of K630A and K630B were operable was considered complete by 2100 hours on May 9, 1997.

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**CAUSE OF EVENT**

The apparent cause of this event was an inadequate surveillance procedure. The approved surveillance procedure, 1/2OST-44A.15, was written to ensure Unit 1 relays K630A and K630B were adequately tested in response to NRC Information Notice 88-83, "Inadequate Testing of Relay Contacts in Safety-Related Logic Systems. The procedure as written, however, has inadequate acceptance criteria to fully test the K630A and K630B relays. This was due to inadequate procedure development.

**CORRECTIVE ACTIONS**

Immediate Corrective Actions:

On May 9, 1997, by 2100 hours additional testing was performed on relay K630A and K630B using procedure 1/2OST-44A.15. This testing verified the operability of relay contacts 1-2 of relays K630A and K630B. This verified these relays were in fact capable of initiating CREBAPS bottle actuation, if required, upon existence of a Unit 1 chlorine detection signal.

Follow-Up Corrective Actions:

1. Procedure 1/2OST-44A.15 will be reviewed and revised, as necessary, to ensure the procedure including its acceptance criteria are adequate to verify the operability of Unit 1 SSPS relays K630A and K630B. The corresponding procedure(s) for testing the similar Unit 2 SSPS relays will also be reviewed and revised, if necessary. These actions will be completed by June 30, 1997 or prior to use.
2. The current process of revising/preparing surveillance procedures will be revised to include a technical review led by System and Performance Engineering. This will be completed by July 31, 1997.
3. An evaluation of the adequacy of surveillance procedures that implement Technical Specifications will be conducted to ensure that they implement the required testing. This evaluation and appropriate revisions will be completed for both Units by January 30, 1998.

**REPORTABILITY**

Failure to adequately perform a OST on August 12, 1996, for relays K630A and K630B meant that their function of actuating the CREBAPS bottles upon a Unit 1 chlorine detection signal with the CREBAPS control transfer switches, TRS-VS-01 and TRS-VS-02, in the "Unit 1" position had not been verified following maintenance. Therefore, this implied that neither the Unit 1 TS LCO 3.7.7.1.b. nor the Unit 2 TS LCO 3.7.7.b. requiring five bottled air pressurization subsystems consisting of two bottles per subsystem being OPERABLE was met under the above configuration. Failure to meet these LCOs, their applicable ACTION STATEMENTS or to enter TS 3.0.3 at both Units is an operation or condition prohibited by TS and is reportable pursuant to the requirements of 10 CFR 50.73(a)(2)(i).

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**SAFETY IMPLICATIONS**

The additional testing of relays K630A and K630B performed on May 9, 1997, verified that these relays were in fact capable of initiating CREBAPS bottle actuation, if required, upon existence of a Unit 1 chlorine detection signal. Based upon this information, there were no safety implications to the health and safety of the public.

**SIMILAR EVENTS**

There were eleven similar events during the last two years regarding inadequate surveillance testing:

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 ESF P-11 Interlock Function," dated May 7, 1997.