



**Duquesne Light**

Nuclear Group  
P.O. Box 4  
Shippingport PA 15077-0604

Telephone (412) 393-4130

April 29, 1992  
ND3MNO:3293

Beaver Valley Power Station, Unit No. 2  
Docket No. 50-412, License No. NPF-73  
LER 92-004-00

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 92-004-00, 10 CFR 50.73.a.2.v.D, "Diesel Generator Sequencing Relays Found Inoperable During Functional Testing".

Very truly yours,

T. P. Noonan  
General Manager  
Nuclear Operations

DSC/sl

Attachment

9205040108 920429  
PDR ALJCK 05000412  
S PDR

*JE22*

April 29, 1992

ND3MNO:3293

Page two

cc: Mr. T. T. Martin, Regional Administrator  
United States Nuclear Regulatory Commission  
Region 1  
475 Allendale Road  
King of Prussia, PA 19406

C. A. Roteck, Ohio Edison  
76 S. Main Street  
Akron, OH 44308

Mr. A. DeAgazio, BVPS Licensing Project Manager  
United States Nuclear Regulatory Commission  
Washington, DC 20555

Larry Rossbach, Nuclear Regulatory Commission,  
BVPS Senior Resident Inspector

Larry Beck  
Centerior Energy  
6200 Oak Tree Blvd.  
Independence, Ohio 44101-4661

INPO Records Center  
Suite 1500  
1100 Circle 75 Parkway  
Atlanta, GA 30339

G. E. Muckle,  
Factory Mutual Engineering  
680 Anderson Drive #BLD10  
Pittsburgh, PA 15220-2773

Mr. Richard Janati  
Department of Environmental Resources  
P. O. Box 2063  
16th Floor, Fulton Building  
Harrisburg, PA 17120

Director, Safety Evaluation & Control  
Virginia Electric & Power Co.  
P.O. Box 26666  
One James River Plaza  
Richmond, VA 23261

W. Hartley  
Virginia Power Company  
5000 Dominion Blvd.  
2SW Glenn Allen, VA 23060

J. M. Riddle  
Halliburton NUS  
Foster Plaza 7  
661 Anderson Drive  
Pittsburgh, PA 15220

April 29, 1992  
ND3MNO:3293  
Page three

Bill Wegner, Consultant  
23 Woodlawn Terrace  
Fredricksburg, VA 22404

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  
Beaver Valley Power Station Unit 2

DOCKET NUMBER (2)  
0 5 0 0 0 4 1 2 1

PAGE (3)  
1 OF 0 4

TITLE (4)  
Diesel Generator Sequencing Relays Found Inoperable During Functional Testing

EVENT DATE (5)			SERIAL NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)				
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)	
03	30	92	92	004	00	04	29	92	N/A		05000	
											05000	

OPERATING MODE (9) 6

POWER LEVEL (10) 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 43. (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(ix)	73.71(b)
20.405(a)(1)(i)	50.38(a)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.38(a)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.08(a)(1)(iii)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)	
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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: T.P. Noonan, General Manager Nuclear Operations

TELEPHONE NUMBER: 412 643-1258

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS
B	E K 2		A 6 1 1	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15): 102992

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On 3/30/92, during a refueling outage, relay personnel were performing a periodic surveillance test on the #1 emergency diesel generator sequencing relays. During this test, three relays were found to be inoperable. One of these relays provide start permissives for the motor driven auxiliary feedwater pump and the quench spray pump. The other two relays reinitiate sequencer operation in the event of a safety injection or Hi-Hi containment pressure. Investigation determined that the relays had failed due to improper application via a design change during the last refueling outage. Later testing found two of the three similar relays on the other train were also inoperable. These relay failures would not have prevented manual operation of the affected components but would have delayed automatic starting of the components by 45 seconds. The relays were replaced and their installation was modified.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENT REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

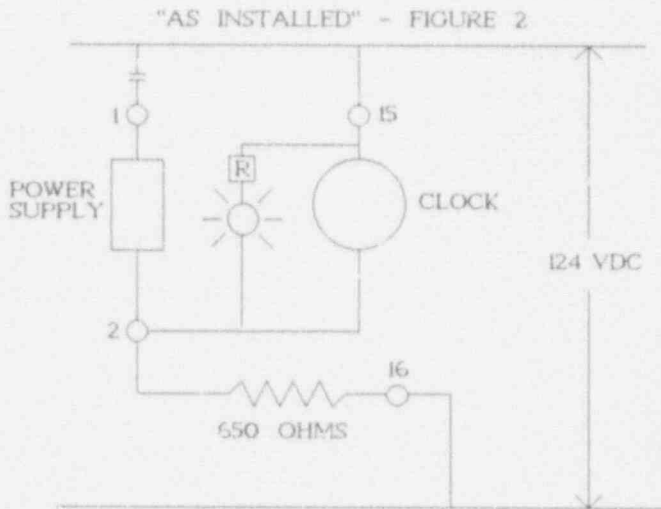
PAGE (3)

Beaver Valley Power Station Unit 2

0 5 | 0 0 | 0 4 | 1 2 | 9 2 | - 0 0 | 0 4 | - 0 0 | 0 3 | OF 0 4

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

When these relays were installed during the last refueling outage, the relays' installation was modified to constantly energize the clock circuits in an effort to enhance the relays' time response (See figure 2). This was done by removing the "jumper" between terminals 1 and 15 and rewiring terminal 15 directly to a voltage source. However, this configuration resulted in the clock circuit being constantly energized at 112 VDC, which is not consistent with the tests used to qualify the relays.



Corrective Actions

The failed relays were replaced. The relay installations were returned to the original design (figure 1) so that the clock circuit and the power supply would energize simultaneously (which is consistent with the relay qualification test). Subsequent testing by plant relay personnel verified proper relay operations, including time response.

Previously Similar Events

Review of station records showed no previous similar events.

Reportability

This event is being reported in accordance with 10 CFR 50.73.a.2.v.D, as an event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-633), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Beaver Valley Power Station Unit 2	DOCKET NUMBER (2)  0 5 0 0 0 4 1 2	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9 2	- 0 0 4	- 0 0	0 4	OF 0 4

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

Safety Implications

Sequencer design provides operational redundancy so that the failed relays would only have delayed the start of the quench spray and auxiliary feedwater pumps by 45 seconds during the initial sequencer operation. The failed relays would not have prevented manual operation of any of the affected components. An engineering evaluation is being performed to determine the safety implications of this event. A supplemental report will be issued detailing the results of this evaluation.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 900 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Beaver Valley Power Station Unit 2	DOCKET NUMBER (2)  0 5 0 0 0 4 1 2 9 2	LER NUMBER (6)		PAGE (3)  OF 0 4
		YEAR	SEQUENTIAL NUMBER	

TEXT (if more space is required, use additional NRC Form 366A's) (17)

Description of Event

On 3/30/92, during a refueling outage, relay personnel were performing a periodic surveillance test on the #1 emergency diesel generator sequencing relays. During this test, three relays were found to be inoperable: relay 162-EGSAA1, relay 762-EGSAA and relay 862-EGSAA. Relay 162-EGSAA1 provides a two second window of opportunity for the motor driven auxiliary feedwater pump (FWE-P23A) and the quench spray pump (QSS-P21A) to start if required between 15 and 17 seconds after the diesel generator has reached its rated speed and voltage. Relays 762-EGSAA and 862-EGSAA reset and reinitiate the sequencer operation if a safety injection or Hi-Hi containment pressure occur before the sequencer has finished timing out (60 seconds after diesel start). Later testing found two of the three similar relays on the other train were also inoperable.

Cause of Event

The relay failures were due to improper design application. These relays were installed via a design change during the last refueling outage. They were designed for 24 VDC applications, but were installed in a configuration that caused the relay clock circuits to be constantly energized with 112 volts. The excessive constant voltage on the clock circuits caused high heat loads that resulted in relay failures. The relays are a sealed case configuration and the only means of heat dissipation is through radiative heat transfer. This design compounded the higher heat loads in the "as installed" configuration.

The relays have two separate internal circuits, a clock circuit and a power supply circuit. Both circuits are designed for 24 VDC operation. However, Beaver Valley's diesel generator sequencer operates on 124 VDC. For applications at this voltage, the manufacturer states a 650 Ohm series resistor can be installed to drop the voltage applied to the relay to 24 VDC. (See figure 1 for typical normal installation.)

