



Duquesne Light

Nuclear Group
P.O. Box 4
Shippingport, PA 15077-0004

Telephone (412) 383-6000

November 26, 1990
ND3MNO:3065

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 90-018-00

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 90-018-00, 10 CFR 50.73.a.2.iv, "ESF Actuation - Inadvertent Diesel Start and D/G Ventilation Fan Circuit Deficiency".

Very truly yours,

T. P. Noonan
General Manager
Nuclear Operations

sl

Attachment

9011300030 901126
PDR ADOCK 05000412
S PDC

TE22
11

November 26, 1990

ND3MNO:3065

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

J. Beall, Nuclear Regulatory Commission,
BVPS Senior Resident Inspector

Larry Beck
Cleveland Electric
6200 Oak Tree Blvd.
Independence, Ohio 44101

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. J. N. Steinmetz, Operating Plant Projects Manager
Mid Atlantic Area
Westinghouse Electric Corporation
Energy Systems Service Division
Box 355
Pittsburgh, PA 15230

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

November 26, 1990

ND3MNO:3065

Page three

W. Hartley
Management Analysis Company
112671 High Bluff Drive
San Diego, CA 92130-2025

J. M. Riddle
NUS Operating Service Corporation
Park West II
Cliff Mine Road
Pittsburgh, PA 15275

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	PAGE (3) 1 OF 0 5
---	--	--------------------------------------	----------------------

TITLE (4)
ESF Actuation - Inadvertent Diesel Start and D/G Ventilation Fan Circuit Deficiency

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 NAMES			DOCKET NUMBER(S)									
1	0	2	6	9	0	9	0	0	1	8	0	0	0	1	1	2	6	9	0	N/A	0 5 0 0 0
												0 5 0 0 0									

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																					
POWER LEVEL (10) 0 0 0	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.406(e)	50.38(c)(1)	50.38(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)(A)	50.73(a)(2)(vii)(B)	50.73(a)(2)(ix)	73.71(b)	73.71(e)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
T.P. Noonan, Gen. Manager Nuclear Operations	4 1 2 6 4 3 - 1 2 5 8

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	B	X X X X	X X X X	N				
B	V	J	X X X X	X X X X	N				

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On 10/26/90, the scheduled Emergency Bus Undervoltage Test (OST 2.36.15) was performed. Per procedure, the installed test circuit was used to block the output of the undervoltage (UV) relays and initiate UV signals. After relay actuation was verified, the UV relays were reset and unblocked, again using the test circuit. The test circuit simultaneously initiates the reset and unblock functions, relying on the time delay of the blocking relay and the test switch to maintain the block function until the UV relay is reset. During the 10/26/90 performance of this test, the blocking relay reset before the UV relay reset, initiating an automatic start of the #1 Diesel Generator. Operators secured the diesel after verifying that no actual UV condition existed. An engineering evaluation of this circuit has been initiated. A caution has been added to the test to require the test switch be held in the reset position for 5 seconds before being returned to normal. During this event, the diesel ventilation supply fan failed to start. Testing and an engineering evaluation of the fan's control circuit identified that the fan would not start after some diesel auto starts. The circuit has been changed to insure that the fan will start following any diesel auto start. Failure of these fans to operate could have resulted in a failure of the diesels during extended operation.

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-630), 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 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9 0	-- 0 1 8	-- 0 0 0	0 2	OF 0 5

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

Description of Event

On 10/26/90, operators were performing the scheduled monthly 4KV and 480V Emergency Bus Undervoltage Test (OST 2.36.15). The surveillance verifies the operability of bus undervoltage protection by performing channel functional tests of each undervoltage relay in accordance with technical specifications. The procedure directs the operators initiate blocking and test signals to each undervoltage relay using installed test switches.

To test a given relay, the operators momentarily place its associated test switch in the TEST position before allowing it to spring return to its normal mid-position. These actions automatically block the output of the relay being tested and send an undervoltage signal to the same relay, causing it to actuate. After verifying that a relay has properly actuated, the operators momentarily place its test switch in the RESET position before again allowing it to spring return to mid-position. This resets the relay and unblocks its output.

On the 10/26/90 performance of this test, when the operators reset Train A undervoltage relay 27-VE2200, the #1 Diesel Generator started due to an undervoltage signal. Operators verified that no actual undervoltage condition existed and secured the diesel.

It was noted that during this event, the #1 Diesel Generator ventilation supply fan HVD*FN270A failed to start. This fan helps to maintain the diesel generator room within its desired temperature during diesel operation. The ambient temperature within the diesel generator room remained within its normal range during this event.

On 11/9/90, further testing was conducted to investigate the failure of the diesel ventilation supply fans to start. Each train was tested by opening the normal supply to its emergency 4KV bus and simultaneously initiating a safety injection signal to the diesel control circuitry. The diesels successfully started and reenergized the busses. The ventilation fans failed to automatically start during this test. Operators verified that the fans still could be manually started under these conditions.

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-630), 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 0	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0	1	8	0	3 OF 5

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

Cause of Event

The initial event was due to operators rapidly resetting undervoltage 27-VE2200. After placing the relay's test switch in the RESET position, they immediately allowed it to return to its normal position instead of returning the switch to mid-position in a more deliberate manner. When the switch was operated in this manner, the relay blocking the output of the undervoltage relay was reset before the undervoltage relay was.

During this period when the undervoltage relay was unblocked and not reset, it initiated a diesel auto start on undervoltage. The diesel start signal latched in and the diesel started as designed. The same undervoltage signal also initiated a diesel ventilation supply fan auto start. However, this signal does not use the same latch in scheme and cleared once the undervoltage relay was reset. This resulted in the fan not being in operation while the diesel was running.

In response to this event, the fans' auto start capability was tested on 11/9/90, as described above. An engineering analysis determined that the fans' control circuitry was inadequate. The fans receive auto start signals from either the test or emergency diesel start circuitry. The start signal to the fans generated by the diesels' test start circuitry locks in, causing the fans to start and continue to run. However, the start signal to the fans generated by the diesels' emergency start circuitry clears as soon as the diesels successfully starts. Thus, on an emergency diesel start (either a safety injection or undervoltage condition), the fans will initially receive a start signal, but the signal will clear and the fans will stop once the diesels' successfully start.

Previous Similar Events

Review of station documents showed no previous events involving inadvertent diesel starts during undervoltage relay testing.

There was one event (Unit 2 LER 88-007-00) where a failed MG-6 blocking relay caused the A 4KV bus loads to shed during undervoltage relay testing. The AE 4KV emergency bus was not de-energized during this event and its diesel did not receive a start signal. The cause of LER 88-007 was found to be inadequate clearance between the blocking relay's electromagnet pole face and contact. This clearance was adjusted and the relay returned to service.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), 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 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			— 0 1 8	— 0 0	0 4	OF 0 5

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

Additionally, there has been one event (Unit 2 LER 90-011-00) where the high radiation isolation signal to four ventilation dampers was discovered not to have a seal-in circuit.

Diesel Generator Reliability

Diesel Generator reliability is trended in accordance with NUMARC 87-00, Appendix D, "EDG Reliability Program". In accordance with the criteria defined by that document, there have been 68 valid starts of the Unit 2 #1 Diesel Generator. Of these 68 starts, there have been no start failures and only 1 valid load failure. The valid load failure occurred on 6/14/89 during a attempt to parallel the diesel onto the emergency bus under low system power factor conditions. The diesel could not reach full load under these conditions due to the setpoint of the mechanical stop on its fuel rack. The vendor was contacted to adjust the fuel rack stop to allow testing under low power factor conditions. It should be noted that the problem that occurred during the 6/14/89 event only affected the ability to test the diesel and did not cause the diesel to be inoperable. In an actual event, the diesel is required to re-energize a bus that has been separated from its normal power supply. In such a case, the diesel could not be affected by the system power factor and would be fully capable of energizing the bus to full load conditions.

Corrective Actions

- 1) The Undervoltage Relay Test procedure has been revised to require operators to maintain the relay test switches in the RESET position for 5 seconds before allowing them to return to mid-position.
- 2) The diesel ventilation fans' start circuitry has been modified to seal in on any diesel auto start signal.
- 3) An engineering evaluation has been initiated to review the unblock/reset scheme used in the undervoltage test circuit. Based on this review, circuit modifications may be initiated.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 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 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			0 1 8	0 0	0 5	OF

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

Safety Evaluation

By restoring undervoltage relay 27-VE2200 after testing, operators generated a non-essential diesel start signal but did not affect the diesel's operability. Throughout the event, the diesel remained fully operable and capable of performing its design function.

Although the diesel's ventilation supply fan did not automatically start during this event, the fan is only needed for long term environmental concerns and is not required for the short term availability of the diesel. In this event (10/26/90), the diesel ran for over an hour without local temperatures exceeding their normal range. Testing on 11/9/90 verified that operators could have manually started the fan using its local control switch in the event of diesel operation due to an actual safety injection or undervoltage condition.