NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Beaver Valley Power Station Unit 2	0 5 0 0 0 4 1 2	1 OF 0 4

TITLE (4)

Overcurrent Relay Trip Leads to ESF Actuation

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)
0 2	1 9	8 8	8 8	0 0 5	0 0	0 3	2 1	8 8	Beaver Valley Unit 1	0 5 0 0 0 3 3 4
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 8 4	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		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 (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
T. P. Noonan, Plant Manager	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 NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	E I A	R L Y	B 4 5 5	N							
D	E I A	R L Y	B 4 5 5	N							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 9	2 1	8 8

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

At 1430 hours on 2/19/88, with Unit 2 at 84% Reactor Power, the Startup Feedwater Pump was started, causing a current surge that actuated an overcurrent relay for the Emergency Response Facility (ERF) 3B Transformer. This relay actuation isolated the transformer, resulting in a loss of power to auxiliary 4KV Bus G. The bus deenergized, which led to the automatic bus transfer of the 480V busses supplied from it. The resulting brief loss of power actuated the instantaneous solid state undervoltage protection of Supplementary Leak Collection Radiation Monitor 2RMR*RQI301, which simulated a high radiation condition and realigned the Main Filter Bank Dampers. The breaker trips were caused by a suspected faulty over-current relay, which has been replaced and sent to the vendor for analysis. In addition, the control power breaker to the "G" bus overcurrent relays was found open due to lack of labeling. The control power breaker has now been identified in alignment checklists and other ERF circuits are being reviewed. OCB-83 was reclosed at 1619 hours on 2/19/88 and the "G" bus reenergized at 0400 hours on 2/21/88. No safety implications resulted from the event because the safety features actuated as required.

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

At 1430 hours on 2/19/88, Unit 2 Control Room operators began to place Startup Feedwater Pump 2FWS-P24 in service. At the time, Unit 2 was operating at 84% reactor power, while Unit 1 was in Cold Shutdown after a refueling outage.

As the pump was started from the Control Room Benchboard, the resulting current surge propagated through the pump supply breaker (1G5) from auxiliary 4160B Bus "G", then through the breaker (1G3) that supplies the bus. The current condition thus actuated the "C" Phase Primary Side Overcurrent Protection Relay for the Emergency Response Facility (ERF) 3B Transformer (Relay 51 V72C). Actuation of this relay resulted in the actuation of two auxiliary relays which isolated the ERF 3B transformer by tripping open the Transformer Supply Breaker (Unit 1 Offsite to Onsite Breaker OCB-83) and the 4KV G Bus Feeder Breaker (1G3). The "G" Bus deenergized, which resulted in the automatic transfer of the 480V busses supplied by it to the "H" Auxiliary Bus. The momentary loss of voltage involved in the transfer was, however, sufficient to actuated the Solid State Undervoltage Protection Relay for Supplementary Leak Collection Radiation Monitor 2RMR-RQI301. The relays actuate on any degradation of supply voltage below 80% lasting 3 cycles.

The loss of power to 2RMR-RQI301 simulated a high radiation signal, which resulted in the realignment of Supplementary Leak Collection System (SLCRS) dampers from the normal, unfiltered path to the filtered path. This realignment constitutes an Engineered Safety Feature (ESF) actuation, and the NRC was notified by Emergency Notification System (ENS) red phone at 1631 hours, within the four-hour provision of 10CFR50.72.b.2.ii. This written report is being submitted under 10CFR50.73.a.2.iv.

The opening of OCB-83 also resulted in a loss of power to the Unit 1 "B" Station Service Transformer, the two normal 4160V busses (C and D) supplied by it, and 4160V Emergency Bus DF. The No. 2 Diesel Generator did not act to pick up the emergency load because it was out of service for governor repairs. However, as Unit 1 was in Cold Shutdown, only one train of 4160 emergency power need be operable in accordance with Technical Specifications, and the "A" Train (AE Bus, No. 1 DG) had been designated as the priority train.

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

Investigation by the station Electrical Maintenance Section indicated that the three Phase Overcurrent Protection Relays for the ERF B Transformer (51V72 A,B,C) were operating satisfactory and they were tested within tolerance by the Duquesne Light Relay Department. However, it is suspected that relay 51V72C (and Gould/Brown Boveri ITE-51D relay) actuated prematurely, in that the current generated by the start of 2FWS-P24 should have been insufficient to energize it. This relay was therefore replaced, with the suspect relay being sent to the vendor for further analysis.

The fact that an ERF transformer protective relay actuated indicated that a downstream overcurrent relay, which should have isolated the pump supply bus had failed Further investigation revealed that the 125 VDC control power for the Overcurrent Protection Relays (51V142ABC and 51V42ABC) on the 4KV G Bus Feeder Breaker (1G3) from the ERF Transformer had been deenergized. The control power circuit breaker located on a DC Panel in the ERF substation had inadvertently been left open because it was not labeled and was mistakenly thought to be an unused spare. This breaker had also been omitted from the ERF Operating Manual Power Supply Switch List. It has since been added to the manual and arrangements have been made to place an identifying label on the breaker itself. Furthermore, a review is being undertaken of the entire ERF substation to identify and resolve any similar problems.

The control circuit was reenergized while returning the "G" Bus to service, whereupon overcurrent relay 51V142A (an ITE 51D) immediately actuated. Testing found it to be faulty. A replacement relay was located, calibrated and installed while the original has been shipped to the vendor (Gould/Brown Boveri ITE) for analysis.

OCB-83 had previously been reclosed at 1619 hours on 2/19/88 to reenergize the Unit 1 4KV busses, while the Filter Banks were aligned to the unfiltered path by 1639 hours. After all transformer bus and pump ground checks were made, with satisfactory results, the "G" Bus Feeder Breaker 1G3 was closed at 0400 hours on 2/21/88. The Startup Feedwater Pump 2FWS-P24A was started successfully at 0457 hours on 2/22/88, with no relay actuations or abnormal current conditions being observed.

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

There were no safety implications to the public arising from this event because the safety related system involved (the SLCRS Main Filter Banks) actuated properly in response to a valid signal. The ERF transformer and 4KV G Bus are auxiliary, non-safety related supplies; furthermore, the relay protective scheme ultimately worked to isolate these sources from the overcurrent condition.

One previous Licensee Event Report (87-13) involved a realignment of the Main Filter Banks due to the loss of power to 2RMR-RQI301 (the cause in that event was operator error). Since the rapid acting nature of the protective relays on the Unit 2 Radiation Monitors makes such an actuation inevitable, an Engineering change is being considered to alter the relay circuitry and prevent such actuation. A supplemental report will be issued to describe any actions taken in that matter, as well as the results of the vendor investigation on the faulty protection relays.

Duquesne Light

Nuclear Group
P.O. Box 4
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Telephone (412) 393-6000

March 18, 1988
ND3SPM:0191

Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
LER 88-005-00

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 88-005-00, 10 CFR 50.73.a.2.iv, "Overcurrent Relay Trip Leads to ESF Actuation".

Very truly yours,

T. P. Noonan
Plant Manager

tlu

Attachment

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1/1

cc: Mr. William T. Russell
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