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FACIL:STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530
AUTH.NAME AUTHOR AFFILIATION
BRADISH,T.R. Arizona Public Service Co. (formerly Arizona Nuclear Power
LEVINE,J.M. Arizona Public Service Co. (formerly Arizona Nuclear Power
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-006-00:on 910824,ESF actuation occurred.Caused by loss of power to 4.16 KV bus.Damage to internal circuitry of switchyard multiplexer terminal repaired.W/910919 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:Standardized plant. 05000530

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	NRR/DST/SRXB 8E	1	1	REG FILE 02	1	1
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EXTERNAL:	EG&G BRYCE,J.H	3	3	L ST LOBBY WARD	1	1
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A0 4

Arizona Public Service Company
PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00742-JML/TRB/WHD
September 19, 1991

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Mail Station P1-37
Washington, D.C. 20555

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 3
Docket No. STN 50-530 (License No. NPF-74)
Licensee Event Report 91-006-00
File: 91-020-404

Attached please find Licensee Event Report (LER) No. 91-006-00 prepared and submitted pursuant to 10CFR50.73. In accordance with 10CFR50.73(d), we are forwarding a copy of the LER to the Regional Administrator of the Region V office.

If you have any questions, please contact T. R. Bradish, Compliance Manager at (602) 393-2521.

Very truly yours,

James M Levine

JML/TRB/WHD/nk

Attachment

cc: W. F. Conway (all with attachment)
J. B. Martin
D. H. Coe
INPO Records Center

IE28

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)
Palo Verde Unit 3	0 5 0 0 0 5 3 0	1 OF 0 5

TITLE (4)

ESF Actuation Due To Loss Of Power To 4.16 KV Bus

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)
									N/A	0 5 0 0 0
0 8	2 4	9 1	9 1	0 0 6	0 0	0 9	1 9	9 1	N/A	0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	1 0 0

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

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
Thomas R. Bradish, Compliance Manager	6 0 2 3 9 3 - 2 5 2 1

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES *(If yes, complete EXPECTED SUBMISSION DATE)*	X NO				

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

At approximately 1934 MST on August 24, 1991, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) at approximately 100 percent power when the normal supply breaker opened between the Unit 3 non-Class 1E 13.8 KV bus and the start-up transformer resulting in a loss of power to the Unit 3 Train "B" Class 1E 4.16 KV bus. This resulted in a Loss of Power (LOP) Engineered Safety Feature Actuation Signal (ESFAS) being generated. The ESFAS resulted in an automatic load shed of the Class 1E bus and start of the Train "B" Emergency Diesel Generator (EDG). The EDG started and assumed the loads as designed. All equipment functioned as designed. No other ESF actuation signals occurred and none were required. Unit 3 continued to operate normally at 100 percent power throughout the event.

The cause of the event was a moisture induced short circuit in the trip circuit for the normal supply breaker. A wind and rain storm was in progress and water was driven into the plant multiplexer cabinet past a degraded seal around an air conditioning duct penetration.

An inspection of the plant multiplexer cabinets for Units 1, 2, and 3 was performed. In Units 1 and 2 no evidence of water intrusion was found. The degraded seal in the Unit 3 multiplexer cabinet was upgraded to metal flashing and resealed.

A previous similar event was reported in Unit 1 LER 528/88-003.

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

At approximately 1934 MST on August 24, 1991, Palo Verde Unit 3 was in MODE 1 (POWER OPERATIONS) at approximately 100 percent power.

B. Reportable Event Description (Including Dates and Approximate Times of Major Occurrences):

Event Classification: An event or condition that resulted in an automatic actuation of an Engineered Safety Feature (ESF)(JE).

At approximately 1934 MST on August 24, 1991, the normal supply breaker opened between the Unit 3 non-Class 1E 13.8 KV bus (BU)(EA) and the start up transformer (XFMR)(EA) resulting in a loss of power to the Unit 3 train "B" Class 1E 4.16 KV bus (BU)(EB). This resulted in a Loss of Power (LOP) Engineered Safety Feature Actuation Signal (ESFAS)(JE) being generated. The ESFAS automatically load shed the Class 1E bus and started the train "B" Emergency Diesel Generator (DG)(EX). The DG started and assumed the loads as designed. All equipment functioned as designed. No other ESF signals were actuated and none were required. Unit 3 continued to operate normally at 100 percent power throughout this event. Technical Specification (TS) Limiting Condition for Operation (LCO) 3.8.1.1 Action a. was completed for one offsite circuit inoperable.

Prior to and during this event a wind and rain storm was in progress. At approximately 1931 MST grounds were detected on two 125 volt DC busses (EI) which supply control power to the Unit 3 non-class 1E 13.8 KV breakers in the switchyard. During the rain storm water entered the plant multiplexer (FJ) cabinet through a degraded seal around the cabinet air conditioning penetration. The water induced a short circuit in the trip indicating light in the breaker tripping circuit resulting in the supply to the Class 1E 4.16 KV bus breaker tripping, and the loss of offsite power to the "B" train Class 1E 4.16 KV bus. After the supply breaker trip, the plant responded as described above.

An inspection and review of the equipment involved in this event was performed by Protective Relay and Control personnel (utility, non-licensed), Electrical Maintenance personnel (utility, non-licensed), and System Engineering Department personnel (utility, non-licensed). It was determined that the breaker did not open due to or as a result of any fault protection signals.

The internal circuitry of the breaker control circuitry was repaired and tested. At approximately 1952 MST on August 25, 1991, the breaker was closed and normal offsite power was restored to the Unit 3 train "B" Class 1E 4.16 KV bus and Action a. of TS LCO 3.8.1.1 was exited. At approximately 2118 MST the train "B" DG was shutdown and returned to normal standby after completion of the required loaded run time.

C. Status of structures, systems, or components that were inoperable at the start of the event that contributed to the event:

Not applicable - no structures, systems, or components were inoperable at the start of the event which contributed to this event.

D. Cause of each component or system failure, if known:

Not applicable - no component or system failures were involved.

E. Failure mode, mechanism, and effect of each failed component, if known:

Not applicable - no component failures were involved.

F. For failures of components with multiple functions, list of systems or secondary functions that were also affected:

Not applicable - no component failures were involved.

G. For a failure that rendered a train of a safety system inoperable, estimated time elapsed from the discovery of the failure until the train was returned to service:

Not applicable - no failures were involved which rendered a train of a safety system inoperable.

H. Method of discovery of each component or system failure or procedural error:

Not applicable - there have been no component or system failures or procedural errors identified.

I. Cause of Event:

The cause of the event was wind driven rain entering the plant multiplexer cabinet through a degraded seal around the cabinet air conditioning penetration (SALP Cause Code C: External Cause). The water caused a moisture induced short circuit in the breaker tripping circuit which caused the feeder breaker supplying power to the "B" train Class 1E 4.16 KV bus to trip, and the LOP ESF actuation as described in section I.B. The degraded seal was the result of weathering and sun aging of the seal material (duct tape and silicone rubber) used on the air conditioning penetration for the plant multiplexer cabinet. Some of the seal material had loosened and allowed the water intrusion. These cabinets are inspected on a semiannual basis. During the last routine semiannual inspection there were no deficiencies noted.

No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event. The event was not a result of personnel errors nor procedural errors.

J. Safety System Response:

Following loss of power to the train "B" Class 1E 4.16 KV bus, the train "B" DG started and energized the train "B" ESF bus within the Technical Specification time requirement. The load sequencer started the following safety systems as required by design: Control Room and Diesel Generator Essential Ventilation (VI & VJ), Essential Battery Chargers (BYC)(EI)., "B" train Auxiliary Feedwater pump (P)(BA), "B" train Essential Cooling Water pump (P)(BI), Essential Spray Pond pump (P)(BI), and "B" train Essential Chiller (CHU)(KM).

K. Failed Component Information:

Not applicable - no component failures were involved.

II. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THIS EVENT:

No adverse safety consequences or implications resulted from this event. The train "B" Diesel Generator properly started and assumed the loads on the train "B" Class 1E 4.16 KV bus. All components operated properly.

III. CORRECTIVE ACTION:

A. Immediate:

1. The damage to the internal circuitry of the switchyard multiplexer terminal was repaired.

2. The multiplexer cabinets in Units 1 and 2 were inspected. The air conditioning duct penetration's in Units 1 and 2 are sealed by metallic flashing. The inspection of the flashing and interior of the cabinets revealed no abnormal conditions. In Unit 3 the degraded sealing material was reworked.

B. Action to Prevent Recurrence:

The air conditioning duct penetration seal in the Unit 3 switchyard multiplexer terminal has been upgraded to metallic flashing. This work was completed on September 16, 1991.

IV. PREVIOUS SIMILAR EVENTS:

A previous similar event was reported in Unit 1 LER 528/88-003 when Palo Verde Units 1 and 2 had a Loss of Power when the Start Up Transformer shed its loads due to a fault in a current transformer and a supply bus. The fault was due to dust and moisture entering the bus enclosure via small openings in the enclosure, thus allowing the fault to track from the enclosure to the bus.

The supply bus enclosure in the previous event was not related to the enclosure or cabinet for the plant multiplexier system. Therefore, the corrective actions of LER 528/88-003 were not applicable to this event.