

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8809020057 DOC.DATE: 88/08/25 NOTARIZED: NO DOCKET #  
 FACIL:STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Publi 05000529  
 AUTH.NAME AUTHOR AFFILIATION  
 SHRIVER,T.D. Arizona Nuclear Power Project (formerly Arizona Public Serv  
 HAYNES,J.G. Arizona Nuclear Power Project (formerly Arizona Public Serv  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-006-00:on 880726,B train loss of power ESF actuation  
 occurred.Caused by inadequate plant design.

W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 7  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:Standardized plant.

05000529

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD5 LA	1 1	PD5 PD	1 1
	LICITRA,E	1 1	DAVIS,M	1 1
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	ACRS WYLIE	1 1	AEOD/DOA	1 1
	AEOD/DSP/NAS	1 1	AEOD/DSP/ROAB	2 2
	AEOD/DSP/TPAB	1 1	ARM/DCTS/DAB	1 1
	DEDRO	1 1	NRR/DEST/ADS 7E	1 0
	NRR/DEST/CEB 8H	1 1	NRR/DEST/ESB 8D	1 1
	NRR/DEST/ICSB 7	1 1	NRR/DEST/MEB 9H	1 1
	NRR/DEST/MTB 9H	1 1	NRR/DEST/PSB 8D	1 1
	NRR/DEST/RSB 8E	1 1	NRR/DEST/SGB 8D	1 1
	NRR/DLPQ/HFB 10	1 1	NRR/DLPQ/QAB 10	1 1
	NRR/DOEA/EAB 11	1 1	NRR/DREP/RAB 10	1 1
	NRR/DREP/RPB 10	2 2	NRR/DRIS/SIB 9A	1 1
	NUDOCS-ABSTRACT	1 1	<u>REG FILE</u> 02	1 1
	RES TELFORD,J	1 1	RES/DSIR DEPY	1 1
	RES/DSIR/EIB	1 1	RGN5 FILE 01	1 1
EXTERNAL:	EG&G WILLIAMS,S	4 4	FORD BLDG HOY,A	1 1
	H ST LOBBY WARD	1 1	LPDR	1 1
	NRC PDR	1 1	NSIC HARRIS,J	1 1
	NSIC MAYS,G	1 1		
NOTES:		1 1		

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 5 2 9										PAGE (3) 1 OF 0 6			
TITLE (4) B-Train Loss of Power, Engineered Safety Feature 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 7	2 6	8 8	8 8	0 0 6	0 0	0 8	2 5	8 8	N/A						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) 1, 0, 0			20.402(b)					20.406(e)					<input checked="" type="checkbox"/> 50.73(a)(2)(iv)					73.71(b)					
			20.406(a)(1)(i)					50.34(c)(1)					50.73(a)(2)(v)					73.71(c)					
			20.406(a)(1)(ii)					50.36(e)(2)					50.73(a)(2)(vi)					OTHER (Specify in Abstract below and in Text, NRC Form 366A)					
			20.406(a)(1)(iii)					50.73(a)(2)(i)					50.73(a)(2)(vii)(A)										
			20.406(a)(1)(iv)					50.73(a)(2)(ii)					50.73(a)(2)(vii)(B)										
			20.406(a)(1)(v)					50.73(a)(2)(iii)					50.73(a)(2)(ix)										
LICENSEE CONTACT FOR THIS LER (12)																							
NAME Timothy D. Shriver, Compliance Manager										TELEPHONE NUMBER 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 NRC		CAUSE	SYSTEM	COMPONENT	MANUFAC- Turer	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFAC- Turer	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFAC- Turer	REPORTABLE TO NRC	
SUPPLEMENTAL REPORT EXPECTED (14)																EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR			
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)																<input checked="" type="checkbox"/> NO							

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

On July 26, 1988, at approximately 0028 MST, Palo Verde Unit 2 was in Mode 1 (POWER OPERATION) at 100% power when a "B" train Loss of Power (LOP) Engineered Safety Feature (ESF) actuation occurred. The "B" train diesel generator started and re-energized the bus as designed.

During the investigation of the cause of the event, a temporary ventilation trunk was determined to have blown off of the turbine building non-class battery room roof and onto the non-class 13.8 kV primary leads of the "B" train ESF transformer 2ENBNX04. The causes of this event were inadequate plant design, inadequate installation of the temporary ventilation trunk, and the inadequate procedural controls for temporary installations.

As immediate corrective action, station electricians removed the ventilation trunk from the transformer leads at approximately 0045 MST without incident. The ventilation trunk was then firmly secured to prevent recurrence. Units 1 and 3 were notified to ensure that adequate measures were taken in those units to preclude a similar event.

Programmatic procedures will be reviewed and revised as necessary.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		88	006	00	02	OF	06

Palo Verde Unit 2

0500052988—006—0002OF06

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

## I. DESCRIPTION OF WHAT OCCURRED:

## A. Initial Conditions:

On July 26, 1988, at approximately 0028 MST, Palo Verde Unit 2 was in Mode 1 (POWER OPERATION) at approximately 100% power.

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

Event Classification: Automatic Actuation of an Engineered Safety Feature (ESF)

On July 26, 1988, at approximately 0028 MST, a "B" train Loss of Power (LOP) from the "B" train ESF transformer (EB)(XFMR) occurred. The "B" train diesel generator (EK) started and reenergized the ESF bus as designed. The Load Sequencer assumed the loads as designed. At the time of the event, an auxiliary operator (utility, non-licensed) saw a flash around the transformer/switchgear area south of the Unit 2 turbine building and notified control room personnel (utility, licensed). Control room personnel requested fire protection personnel (utility, non-licensed) to respond as a precautionary measure.

During the investigation of the cause of the event, a temporary ventilation trunk was determined to have blown off of the turbine building non-class battery room roof and onto the non-class 13.8 kV primary leads of the "B" train ESF transformer 2ENBNX04. At the time of the event, wind speeds of twenty-five miles per hour were recorded on Emergency Response Facility Data Acquisition and Display System (ERFDADS). In combination with the heavy rains, the wet ventilation trunk provided a conductive path between the line-side phases of 2ENBNX04. The protective relaying (RLY) actuated, tripped open the 13.8 kV supply breaker (BRK) to 2ENBNX04, and caused the LOP.

The primary operator (utility, licensed) opened the upstream breaker (2ENANS06C2) for the bus (2ENANS04) supplying the ESF transformer to ensure that 2ENANS04 was deenergized. Station electricians removed the ventilation trunk from the transformer leads at approximately 0045 MST without incident. The ventilation trunk was re-installed and firmly secured to prevent recurrence. Units 1 and 3 were notified to ensure that adequate measures were taken to preclude a similar event.

A Work Order was initiated to inspect and clean the ESF transformer supply cables (CBL), to megger cables from the transformer back to the supply bus and to inspect and clean the insulators and terminations. The work order was completed and no problems with the transformer or associated bus were identified.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)  Palo Verde Unit 2	DOCKET NUMBER (2)  0 5 0 0 0 5 2 9	LER NUMBER (6)			PAGE (3)		
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		8 8	— 0 0 6	— 0 0	0 3	OF	0 6

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

Engineering personnel (utility, non-licensed) reviewed the digital fault recorder data. The data indicated that the transformer A-phase fault current was 18 KA for approximately 3.25 cycles (.0542 seconds). Engineering personnel determined that the fault was sufficiently short and small in magnitude so as not to require a double test on the transformer. The "B" train ESF transformer was placed back into service at approximately 1858 MST on July 26, 1988. No problems were encountered when the transformer was reenergized.

Prior to this event, on July 20, 1988, the onshift Shift Technical Advisor (utility, licensed) notified the assistant shift supervisor (utility, licensed) that the subject ventilation trunk was blowing in the wind and should be properly secured to the turbine building non-class battery room roof. The assistant shift supervisor notified maintenance personnel (utility, non-licensed) of the situation and requested that the ventilation trunk be properly secured. Maintenance personnel tied down the ventilation trunk on July 20, 1988 using quarter inch rope and wire. However, the ventilation trunk was not sufficiently restrained for the wind experienced during the thunderstorm on July 26, 1988.

On June 17, 1985, an Engineering Evaluation was initiated to identify that inhalation of the ammonia and other chemical fumes (hydrazine) from the 100 foot elevation turbine building chemical addition tanks presented a potential personnel safety hazard. On August 8, 1985 the temporary ventilation exhaust system was installed on an interim basis to determine the effectiveness of a ventilation system in removing the chemical fumes from the turbine building. If adequate, a permanent plant change would be initiated and a permanent system would be designed and installed.

The system engineer (utility, non-licensed) verified that the interim installation performed adequately and on August 8, 1985, the engineer initiated a Plant Change Request (PCR). On September 25, 1985 ANPP determined that the PCR would not be implemented at that time since the design change was not required for plant/personnel safety or compliance with regulatory requirements. This determination was based on limits contained in 29CFR1910.1000- Air Contaminants, and actual levels present in the turbine building. On November 11, 1986 the system engineer changed the design document to a site modification 1,2,3-SM-SC-001. However, the requested change was again reviewed in November, 1986, and determined to not meet the design change criteria in place at the time. On April 14, 1988, the site modifications were cancelled and PCR #88-13-SC-011 was initiated. On July 26, 1988, the Engineering Manager (utility, non-licensed) approved the new PCR.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

- 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 that contributed to the event.

- D. Cause of each component 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 failure that rendered a train of a safety system inoperable, estimated elapsed time from the discovery of the failure until the train was returned to service:

Not applicable - No failures were involved.

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

During the investigation of this event, programmatic deficiencies were identified in the control of temporary installations, transient materials, and housekeeping. An investigation is being conducted and documented in a Special Plant Event Evaluation Report (SPEER).

- I. Cause of Event:

During the investigation, several causes of this event were identified.

1. The original plant design did not provide adequate ventilation of the fumes from the chemical addition tanks on the 100 foot level of the turbine building.
2. The temporary ventilation trunk was inadequately secured and improperly routed. The guidance provided for the installation was inadequate for the extended period of use.
3. The procedural controls did not prohibit the extended installation of the temporary ventilation trunk without adequate review and approval.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

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

4. The procedures do not properly interface to ensure that temporary installations require the implementation of the temporary modification procedure as appropriate.

As previously discussed, an investigation is being conducted and will be documented in a SPEER. If this investigation identifies additional information that would significantly alter the readers perception of the causes of this event, a supplement to this report will be issued.

J. Safety System Response:

Following the loss of power on the "B" train ESF transformer, the "B" Diesel Generator started and energized the "B" train 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, "B" train Auxiliary Feedwater pump (BA), "B" train Essential Cooling Water pump (BI), Essential Spray Pond pump, and "B" train Essential Chiller (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 "B" train Diesel Generator properly started and assumed the loads on the "B" train ESF bus.

III. CORRECTIVE ACTIONS:

A. Immediate:

The ventilation trunk was removed from the ESF transformer leads, shortened, rerouted, and securely fastened. Units 1 and 3 were notified to ensure that adequate measures were taken to preclude a similar event.

B. Action to Prevent Recurrence:

A temporary modification for the use of the ventilation trunk has been issued. A PCR has been initiated for the permanent installation of ventilation to the Turbine Building 100 foot elevation, chemical addition tank area.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Palo Verde Unit 2	0 5 0 0 0 5 2 9	8 8	0 0 6	0 0	0 6	OF	0 6

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

As a result of the SPEER, revisions to the programmatic control procedures will be issued to address the deficiencies in controlling temporary installations.

## IV. PREVIOUS SIMILAR EVENTS:

No similar events have been reported pursuant to 10CFR50.73.

## V. ADDITIONAL INFORMATION:

If additional information concerning the event is discovered which would significantly alter the reader's perception or would significantly alter the corrective action, a supplement to this report will be issued.





## Arizona Nuclear Power Project

P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

192-00405-JGH/TDS/JJN  
August 25, 1988

U. S. Nuclear Regulatory Commission  
NRC Document Control Desk  
Washington, D.C. 20555

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Unit 2  
Docket No. STN 50-529 (License No. NPF-51)  
Licensee Event Report 2-88-006-00  
File: 88-020-404

Attached please find Licensee Event Report (LER) No. 88-006-00 prepared and submitted pursuant to 10CFR 50.73. In accordance with 10CFR 50.73(d), we are herewith forwarding a copy of the LER to the Regional Administrator of the Region V office.

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

Very truly yours,

J. G. Haynes  
Vice President  
Nuclear Production

JGH/TDS/JJN/kj

Attachment

cc: D. B. Karner (all w/a)  
E. E. Van Brunt, Jr.  
J. B. Martin  
T. J. Polich  
M. J. Davis  
A. C. Gehr  
INPO Records Center

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