

Arizona Public Service Company

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

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00728-JML/TRB/WH
July 10, 1991

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

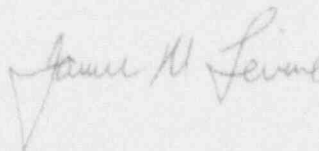
Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Licensee Event Report 89-025-01
File: 91-020-404

Attached please find Supplement 1 to Licensee Event Report (LER) No. 89-025-00 prepared and submitted pursuant to 10CFR50.73. This supplement is being provided to clarify the review activities outlined in the additional information section of the LER and to correct the schedule for the completion of the actions discussed in that section. 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,



JML/TRB/WH/nk

Attachment

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

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 1 DOCKET NUMBER (2) 0 5 0 0 0 5 2 8 1 OF 0 7

TITLE (4) Missing Radiant Energy Barrier

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	1	0	3	8	9	8	9	0	2	5	0	1	0	7	1	0	9	1	N/A	0	5	0	0	0
																		N/A	0	5	0	0	0	

OPERATING MODE (9)		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(c)	50.73(a)(2)(iv)	73.71(b)												
				20.405(a)(1)(i)	50.36(a)(1)	50.73(a)(2)(v)	73.71(c)												
				20.405(a)(1)(ii)	50.36(a)(2)	50.73(a)(2)(vii)	X 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)	T.S. 6.9.3												
				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 Thomas R. Bradish, Compliance Manager TELEPHONE NUMBER 6 0 2 3 9 3 - 1 2 5 2 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		

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

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

On November 3, 1989, at approximately 1400 MST, Palo Verde Unit 1 was in MODE 6 (REFUELING) when APS engineering personnel discovered that a radiant energy fire barrier was missing from one of the two pressurizer auxiliary spray valves in the pressurizer room. Prior to restart from the refueling outage, the missing radiant energy barrier was replaced on March 26, 1990.

On April 17, 1991, APS completed an evaluation of the safety significance of the missing radiant energy barrier and determined that the missing radiant energy barrier would have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire. Investigation had determined that the radiant energy barrier had been missing for approximately 32 months. The barrier had not been replaced following maintenance on the pressurizer auxiliary spray valve in July of 1987. An inspection of the pressurizer auxiliary spray valves in Units 2 and 3 found the radiant energy barriers properly installed on March 14, 1990.

The cause of this event was that the drawings for the pressurizer auxiliary spray valve did not include a plant design change which added the radiant energy barrier. This omission allowed personnel generating work documents to omit the requirement in the work document to reinstall the radiant energy barrier.

There have been no previous similar events reported pursuant to T.S. 5.9.3.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Palo Verde Unit 1	0 5 0 0 0 5 2 8 8 9	—	0 2 5	—	0 1	0 2	OF 0 7

TEXT

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

On November 3, 1989 at 1400 MST, Palo Verde Unit 1 was in Mode 6 (REFUELING) with Reactor Coolant System (RCS) (AB) less than 210 degrees Fahrenheit and at atmospheric pressure.

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

Event Classification:

A condition that resulted in a violation of the requirements of the Fire Protection Program described in the Final Safety Analysis Report which would have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire.

On November , 1989, at approximately 1400 MST during a refueling outage, APS engineering personnel (utility, non-licensed) were performing a walkdown of the pressurizer room in the Unit 1 containment building (NH) to check on the placement of thermolag insulation in that room. During the walkdown it was discovered that the radiant energy barrier for one of the two pressurizer auxiliary spray valves (FSV) was missing. The radiant energy barrier is only installed on the "A" Train spray valve and consists of metallic reflectorized insulation around the solenoid valve to provide radiant shielding in the event of a fire. The pressurizer auxiliary spray valves are used as the alternate method of pressure control should normal spray function be lost (i.e., loss of reactor coolant pump flow (AB)(P)).

A material non-conformance report was initiated to ensure that the radiant energy barrier was replaced prior to restart from the refueling outage. The radiant energy barrier was replaced on March 26, 1990, prior to Unit 1 restarting from the refueling outage.

When the missing radiant energy barrier was discovered, APS initiated an investigation in accordance with the PVNGS Incident Investigation Program. The investigation determined that the radiant energy barrier had been removed during maintenance performed in the pressurizer auxiliary spray valve in July of

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 8	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 9	0 2 5	0 1	0 3	OF	0 7

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

1987. Therefore, the radiant energy barrier was not installed for approximately 32 months (July, 1987 to March, 1990)

Additionally, an engineering evaluation was initiated to determine if the missing radiant energy barrier would have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire. The engineering evaluation, which was completed on April 17, 1991, concluded that if a fire had occurred in the pressurizer room, both pressurizer auxiliary spray valves could have been prevented from performing their safety function.

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

There were no structures, systems, or components that were inoperable at the time of the event that contributed to the event. However the radiant energy barrier for the Unit 1 "A" Train pressurizer auxiliary spray valve (1-J-CHA-HV-205) was not installed from July 1987 to March 26, 1990.

- 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:

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 8 8 9	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
			- 0 2 5	- 0 1	0 4	OF	0 7

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

There were no component or system failures. As described in Section I.B, the radiant energy barrier was discovered to be missing during an engineering walkdown of thermolag insulation in the pressurizer room. Subsequent investigation revealed that the radiant energy barrier was initially removed during maintenance work on the pressurizer auxiliary spray valve and was not replaced when that work was completed. The work document used for maintenance on the pressurizer auxiliary spray valve or subsequent work documents to replace insulation did not include adequate instructions to ensure that the radiant energy barrier was replaced.

I. Cause of Event:

The cause of this event was that the drawings used to implement a plant design change (i.e., the installation of the radiant energy barrier) were not correctly closed during the final site modification change process. Initially the site modification work was accomplished using a sketch included in the design change package, and that sketch was not reflected in the final site modification change documents. This deficiency is considered to be a personnel error since both past and present procedures adequately described the requirements for including sketches or drawings in the final documents (SALP Cause Code A: Personnel Error).

As a result of this deficiency, inadequate instructions were written into a work document for repair of the Unit 1 pressurizer auxiliary spray valve in July of 1987. The work document for work on the pressurizer auxiliary spray valve was vague in that it only required the removal of insulation. There was no mention of removing the radiant energy barrier. During the removal of the insulation, the insulation was damaged. A subsequent work document to replace the damaged insulation was prepared by different personnel. These personnel were unaware that the radiant energy barrier was required because the plant drawings did not specify any requirements for the radiant energy barrier.

No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event.

J. Safety System Response:

Not applicable - there were no safety system responses and none were necessary.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 6 8 9 — 0 2 5 — 0 1 0 5 OF 0 7	LER NUMBER (6)			PAGE (3)		
		EAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

K. Failed Component Information:

Not applicable - no component failures were involved.

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

If a fire had occurred in the pressurizer room, the possibility existed that the ability to control both of the pressurizer auxiliary spray valves could have been lost. The barrier is only installed to protect one of the two valves assuring that if a fire occurred, one train would be available. Therefore, the missing radiant energy barrier could have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire.

The availability of the pressurizer auxiliary spray function is credited in the Updated Final Safety Analysis Report (UFSAR) for the pressure control function when cooling down to cold shutdown within 72 hours. However, the likelihood of a fire defeating both pressurizer auxiliary spray valves is considered to have been small for the following reasons:

1. The combustible loading in the pressurizer room (Fire Zone 65) is only 8 minutes, consisting principally of cable insulation.
2. Line-type detectors are provided for early warning of fire in the pressurizer room.
3. Portable CO2 fire extinguishers are provided in an adjacent fire zone for manual fire fighting. Firehose stations are available in an adjacent fire zone.

III. CORRECTIVE ACTION:

A. Immediate:

1. The radiant energy barrier for the pressurizer auxiliary spray valve was replaced in accordance with an approved work authorization document on March 26, 1990, while Unit 1 was still in a refueling outage.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 05000528	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		89	025	01	06	OF	07

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2. On March 14, 1990, an engineering walkdown was completed in Units 2 and 3 to verify that all other pressurizer auxiliary spray valve radiant energy barriers were in place.

B. Action to Prevent Recurrence:

An independent investigation of this event was conducted in accordance with the PVNGS Incident Investigation Program. Based upon the results of this investigation, it was determined that the past and current procedures adequately define responsibilities for providing technically correct plant modifications, design output documents and work order preparations. The overall quality program for design and installation is adequate. Additionally, action has been taken to reemphasis to engineering personnel, through the continuing training program, that design change documentation must contain sufficient information to properly reflect the as built plant conditions.

The PVNGS administrative control procedure used as a reference for work document development has been revised to emphasize that radiant energy barriers or shields are fire-rated assemblies, and thus will be addressed as such in all work authorization documents.

IV. PREVIOUS SIMILAR EVENTS:

There have been no previous similar events reported pursuant to T.S. 6.9.3 or 10CFR50.73.

V. ADDITIONAL INFORMATION:

The radiant energy barrier for the Unit 1 pressurizer auxiliary spray valve was discovered missing on November 3, 1989, while Unit 1 was in a refueling outage. The radiant energy barrier was replaced prior to restart from the outage. An engineering evaluation was initiated to determine if the condition could have adversely affected the ability to achieve or maintain safe shutdown if a fire had occurred during the period the barrier was not installed. The engineering evaluation was completed on April 17, 1991.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 15 0 0 0 5 2 8 8 9	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		— 0 2 5	— 0 1		0 7	OF	0 7

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

Timeliness of engineering evaluations conducted to support safety assessment reviews was previously identified and a Corrective Action Report (CAR) was written on September 14, 1990, to address this problem.

In response to the CAR the following actions are being taken:

1. APS is tracking engineering evaluations which have a safety assessment review requested to ensure that the subject reviews are completed in a timely manner.
2. Engineering has contracted with Impell Corporation to perform safety assessment reviews of deficiencies originally documented in the CAR. One safety assessment review remains to be completed. (Note: The second safety assessment review discussed in Revision 0 to LER 528/89-025 has been completed.) The remaining safety assessment review addresses approximately 46 fire barrier penetrations in each unit. The review will be evaluated after the results of the TENERA fire barrier walkdown (Ref: LER 529/90-000) have been incorporated into the fire barrier/penetration design basis. The update to the design basis and the safety assessment review are expected to be completed by December 31, 1991.