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 FACIL:STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Publi 05000528
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 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-017-01:on 891023,four penetrations into seismic gap
 area between diesel generator & control bldg.

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Arizona Public Service Company

PALO VERDE NUCLEAR GENERATING STATION

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

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00632-JML/TRB/KR

February 25, 1990

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Licensee Event Report 1-89-017-01
File: 89-020-404

Attached please find Supplement Number 1 to Licensee Event Report (LER) No. 89-017-00 prepared and submitted pursuant to 10CFR50.73. In accordance with 10CFR50.73(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. R. Bradish, (Acting) Compliance Manager at (602) 393-2521.

Very truly yours,

James M. Levine

JML/TDS/KR/kj

Attachment

cc: W. F. Conway (all w/a)
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J. B. Martin
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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) Palo Verde Unit 1 DOCKET NUMBER (2) 0 5 0 0 0 5 2 8 1 PAGE (3) 1 OF 0 7

TITLE (4) Four Penetrations into Seismic Gap Area Between Diesel Generator and Control Building

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	3	8	9	8	9	0	1	7	0	1	0	2	2	5	9	0	Palo Verde Unit 2	0 5 0 0 0 5 2 9
																			Palo Verde Unit 3	0 5 0 0 0 5 3 0

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

OPERATING MODE (9)	20.402(b)	20.406(c)	60.73(a)(2)(iv)	73.71(b)
N				
POWER LEVEL (10)	20.406(a)(1)(i)	60.36(c)(1)	60.73(a)(2)(v)	73.71(c)
0 0 0	20.406(a)(1)(ii)	60.36(c)(2)	60.73(a)(2)(vi)	
	20.406(a)(1)(iii)	X 60.73(a)(2)(ii)	60.73(a)(2)(vii)(A)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iv)	60.73(a)(2)(iii)	60.73(a)(2)(vii)(B)	
	20.406(a)(1)(v)	60.73(a)(2)(iii)	60.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Thomas R. Bradish, (Acting) Compliance Manager	AREA CODE 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 NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On October 23, 1989, at approximately 1030 MST, Palo Verde Unit 1 was in a refueling outage with the core off-loaded, Palo Verde Unit 2 was in Mode 3 (HOT STANDBY) and Palo Verde Unit 3 was in Mode 5 (COLD SHUTDOWN) when four unsealed penetrations into the Unit 3 seismic gap area between the Diesel Generator Building and the Control Building were discovered during a visual inspection of the 94 foot elevation Diesel Building pipe trenches. The equivalent penetrations in both Units 1 and 2 were visually verified to be unsealed. In addition, the Unit 1 Diesel Generator "A" Control Equipment Room pipe trench floor had traces of diesel oil.

Since safe shutdown cables transverse this gap area with no vertical fire-rated barrier separation, and since there is no fire detection or suppression equipment within the gap area, the potential exists for a flammable or combustible liquid spill-type fire in this area to cause a loss of both Diesel Generators in the affected Unit.

As immediate corrective action, fire watches were established in all three Units for the seismic gap area. Work is in progress to seal the penetrations in all three units with 3-hour rated seals. The cause was a cognitive personnel error when engineering personnel failed to identify the penetrations in 1986.

A previous similar event was reported in LER 85-096-00.

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-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.

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Palo Verde Unit 1

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

On October 23, 1989, Palo Verde Unit 1 was in a refueling outage with the core (AC) off-loaded to the Spent Fuel Pool. Palo Verde Unit 2 was in Mode 3 (HOT STANDBY). Palo Verde Unit 3 was in Mode 5 (COLD SHUTDOWN).

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

Event Classification:

Condition specified in the Plant's Technical Specifications (6.9.3) as a violation of the requirements of the fire protection program described in the Updated Final Safety Analysis Report (FSAR) Appendix 9B.2 Fire Hazard Analysis, which would adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

On October 23, 1989, at approximately 1030 MST, four unsealed penetrations into the Unit 3 seismic gap area between the Diesel Generator Building (NB) and the Control Building (NA) were discovered during a visual inspection of the area.

During a walk-down conducted by APS engineers (contractor and utility, non-licensed), at approximately 1530 MST, on October 19, 1989, it was questioned if there was a potential for penetrations to be located in the pipe trenches in the Control Equipment Room located on the 100 foot elevation of the Diesel Generator Building. The question was raised due to the perpendicular orientation of the trenches to the fire wall. As a result of the walk-down, a work request was issued to remove the floor grating over the 100 foot Diesel Building pipe trenches to visually inspect the pipe trenches for adequate sealing from the seismic gap area that separates the Diesel Generator Building from the Control Building.

On October 23, 1989, at approximately 1030 MST, APS engineers (utility, non-licensed) visually inspected the pipe trenches exposed after the floor grating had been removed and discovered four unsealed penetrations into the Unit 3 seismic gap area between the Diesel Generator Building and the Control Building.

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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.

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

At approximately 1145 MST on October 23, 1989, Fire Protection personnel (utility, non-licensed) were notified of the unsealed penetrations and as immediate corrective action, fire watches were established in all three Units for the seismic gap.

As a result of the walk-down, it was identified that the Diesel Generator Building fire wall at the 94 foot elevation has four unsealed penetrations into the seismic gap area. Two penetrations are located under the door way; each approximately 4 feet 3 inches high by 1 foot 4 inches wide. The other two penetrations are located at the 94 foot elevation in the Diesel Generator Building "A" and "B" Diesel Control Equipment Room trenches. These penetrations are approximately 4 feet 3 inches high by 3 feet 3 inches wide. Subsequently, on October 23, 1989, the equivalent penetrations in both Units 1 and 2 were visually verified to be unsealed.

In addition, on October 23, 1989, it was noted that the Unit 1 Diesel Generator Building "A" Diesel Control Equipment Room pipe trench floor had traces of diesel oil. Further investigation by APS engineers (utility, non-licensed) indicated that the diesel oil residue may have originated from the floor drain located in the trench during maintenance of the oil strainers in Diesel Generator "A" Engine Room while the drain sumps were tagged out by Operations.

A 6-inch seismic gap area separates the Diesel Generator Building from the Control Building. The seismic gap is necessary to allow for relative seismic motion of the two buildings. The Diesel Generator Building and the Control Building are separated by two independent 3 hour fire rated walls. Since there is no fire detection or suppression equipment within the gap area, all penetrations through the walls are required to be sealed with materials of equivalent fire resistance unless approved deviations are documented in the fire hazards analysis. This configuration assures that a fire originating in either the Diesel Generator Building or the Control Building will not propagate into the seismic gap.

Control cables associated with the diesel generators are routed from the Diesel Generator Building into the Control Building. The Train A and Train B safe shutdown cables transverse the seismic gap area through conduit expansion/deflection fittings and open cable trays and have no vertical fire-rated barrier separation.

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-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.

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

A Plant Change Request was written to initiate a design change to seal the four pipe trench penetrations in the 3 hour fire area boundary wall at the seismic gap to protect redundant safe shutdown cables in the seismic gap area in order to prevent possible fire exposure to both safe shutdown trains.

- 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

An investigation of this event determined that the root cause of this event was the failure by engineering personnel (contractor and utility, non-licensed) to identify all the penetrations in

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-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.

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

1986 (SALP Cause Code A). The error was not procedurally related nor were there any unusual characteristics of the work location that directly contributed to the error.

Contributing to the failure to identify the penetrations in 1986 was the fact that the penetrations were not readily visible due to the existence of floor grating and concrete floor sills over the pipe trenches. The combination of the floor grating and the sills over the pipe trenches allows only a vertical view of the trench, thereby making a wall observation difficult. In 1986, the grates were apparently not removed and consequently, the north wall below the 100 foot elevation was not thoroughly inspected.

J. Safety System Response:

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

K. Failed Component Information:

Not applicable - no component failures were involved.

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

The potential safety implication of this event is that a fire in this seismic gap area may result in a loss of both Diesel Generators for the respective Unit. The existing fixed combustible loads in the gap areas are minimal and no credible ignition sources exist. Prior to discovery of this event, a fire in the seismic gap area of sufficient magnitude to cause a loss of both Diesel Generators would require the admission of transient combustibles and an ignition source through the penetrations. The feasibility of this type of fire was minimal due to recessed configuration of the pipe trenches and to an existing administrative control procedure governing transient combustibles. In addition, the utility fire protection staff continuously reviews the Units for transient combustibles.

III. CORRECTIVE ACTION:

A. Immediate:

Fire watches have been established in Units 1, 2, and 3 for the areas with improperly sealed penetrations to the seismic gap area.

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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.

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

The fire watches will be maintained until the penetrations are properly sealed.

A Plant Change Request was written to initiate a design change to seal the four pipe trench penetrations in the 3-hour fire area boundary wall at the seismic gap. The fire seals will protect redundant safe shutdown cables in the seismic gap area in order to prevent possible fire exposure to both safe shutdown trains.

B. Action to Prevent Recurrence:

As permanent corrective action, 3-hour fire rated seismic gap seals will be installed to seal each of the penetrations. In accordance with approved site modification documentation, work is in progress to seal the penetrations in all three units with approved 3-hour rated materials. The scheduled date for completion of the installation of seals in all three units is March 15, 1990.

An engineering evaluation and inspection of the seismic gap area has been completed. Other than the four penetrations identified in this LER, there were no previously unidentified penetrations found (sealed or unsealed).

In response to the water/oil migration concerns raised in the Diesel Generator Building, a flooding analysis was performed. This additional evaluation concluded that at the 100 foot elevation, liquid (oil/water) in one train of the Diesel Generator Building could migrate to the other train. Therefore, in order to assure safe shutdown of the plant in accordance with 10CFR50 Appendix R, it is necessary to provide curbs or other suitable methods of controlling flooding (which may involve burning oil) from potentially affecting both trains of the Diesel Generator Building. As a compensatory measure for oil fire/flooding concerns at the 100 foot elevation, until curbs or other suitable methods of preventing oil/water flooding into both trains are provided, an hourly fire watch will be established during periods when the diesel generators are required to be operable. A Plant Change Request (PCR) will be written to initiate a design change to install curbs or other suitable methods of preventing oil/water flooding into both trains. The PCR is scheduled for Plant Modification Committee (PMC) review on March 20, 1990. Based on the outcome of the PMC review, a schedule to implement the design change will be developed.

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TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 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.

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

IV. PREVIOUS SIMILAR EVENTS:

LER 85-096-00 identified two doorway penetrations through the seismic gap area between the Diesel Generator Building and the Control Building which had not been identified and analyzed during the Fire Hazard Analysis. Corrective action included installation of fire seals around each of the doorway penetrations in the seismic gap area.

Because the resolution of LER 85-096-00 included an evaluation of the seismic gap area between the Diesel Generator Building and the Control Building, the unsealed penetrations identified by LER 89-017-00 should have been discovered and corrected in 1986. The failure to identify the penetrations is believed to be an isolated occurrence. However, APS will continue to evaluate occurrences such as this to ensure corrective actions taken adequately address the root causes. Additionally, programs have been and are currently being developed to improve the content and quality of the engineering training program to adequately address the skills and knowledge needs of the individual engineers.

As discussed in Section I.I, the cause of the event reported in this LER (528/89-017) was a cognitive personnel error. Cognitive personnel errors that are the result of mental lapses are not normally correctable with revised procedures or additional training. Therefore, the corrective actions for the previous event would not have prevented this event.

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