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SUBJECT: LER 90-001-00:on 900209,ESF actuation caused by radiation
 monitor spike.

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Arizona Public Service Company

PALO VERDE NUCLEAR GENERATING STATION
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JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00638-JML/TRB/SBJ
March 22, 1990

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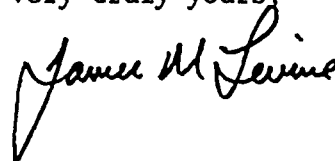
Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528 (License No. NPF-41)
Licensee Event Report 90-001-00
File: 90-020-404

Attached please find Licensee Event Report (LER) No. 90-001-00 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,



JML/TRB/SBJ/tlg

Attachment

cc: W. F. Conway (all with attachment)
J. B. Martin
E. E. Van Brunt
D. H. Coe
T. L. Chan
A. C. Gehr
J. R. Newman
Inpo Records Center

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PDR ADOCK 05000528
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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 1 8 PAGE (3) 1 OF 0 6

TITLE (4)

Engineered Safety Feature Actuation caused by Radiation Monitor Spike

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	2	0	9	0	9	0	0	0	0
0	2	2	0	9	0	0	0	1	0	0
0	3	2	2	9	0					
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)										
OPERATING MODE (9)		5		20.402(b)		20.405(c)		X 50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)		0 0 10		20.405(a)(1)(i)		50.38(c)(1)		50.73(a)(2)(v)		73.71(c)
				20.405(a)(1)(ii)		50.38(c)(2)		50.73(a)(2)(vi)		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)(vii)(A)		T.S. 3.3.3.8
				20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)		Action 42.b
				20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME Thomas R. Bradish, Compliance Manager TELEPHONE NUMBER 610 239 131-1215 1211

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) ☐ NO EXPECTED SUBMISSION DATE (15) 0 4 3 10 9 10

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

On February 20, 1990, Palo Verde Unit 1 was in Mode 5 with the reactor coolant system at atmosphere pressure and approximately 92 degrees fahrenheit. At approximately 0429 MST, the fuel building exhaust ventilation high range radiation monitor (RU-146) was energized following completion of a modification. When the radiation monitor was energized, the fuel building exhaust ventilation low range radiation monitor spiked. This spike initiated the fuel building ventilation actuation system (FBEVAS) trains A and B, and the control room essential filtration actuation system (CREFAS) trains A and B. The actuated systems were secured by approximately 0500 MST.

The cause of the spike was determined to be noise in the radiation monitors common ground circuit. Because the event was associated with the modification that had just been completed, RU-144 and RU-146 were not declared operable until the noise in the ground circuit was eliminated. These radiation monitors were out of service greater than 72 hours, therefore this report is also being made in accordance with technical specification 3.3.3.8 action 42(b).

The root cause of the event is under investigation in accordance with the PVNGS incident investigation program. The results of this investigation will be provided in a supplemental report.

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 368A's) (17)

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

On February 20, 1990 Palo Verde Unit 1 was in Mode 5 with the reactor coolant system (RCS)(AB) at approximately 92 degrees Fahrenheit and at atmospheric pressure.

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

Event Classification: Submitted in accordance with 10CFR50.73(a)(2)(iv), engineered safety feature actuation, and Action 42.b of Technical Specification 3.3.3.8

On February 20, 1990 at approximately 0051 MST, the plant ventilation system high range radiation monitor (IL)(VL), RU-144, was declared inoperable in order to modify the radiation monitor power supply (see Special Report 259-88-002). At approximately 0226 MST the fuel building ventilation system high range radiation monitor (IL)(VG), RU-146, was declared inoperable in order to modify the radiation monitor power supply (see Special Report 259-88-002). After obtaining the approval of the assistant shift supervisor (utility, licensed), maintenance personnel (utility, non-licensed) deenergized RU-146. At approximately 0429 MST RU-146 was energized following completion of the modification. When the circuit was energized the fuel building ventilation system low range radiation monitor, RU-145, indication increased approximately five decades and caused a train "B" fuel building ventilation actuation signal (FBEVAS)(VG). This signal cross tripped the "A" train FBEVAS and control room essential filtration actuation signal (CREFAS)(VI) trains "A" and "B". Radiation protection was contacted and subsequently initiated surveys of the fuel building (ND). No unusual radiological conditions were identified.

The control room operator secured the normal control room ventilation fans in accordance with the alarm response procedure at approximately 0442 MST. At approximately 0447 MST the control room operator completed equipment actuation verifications. All operable equipment responded as designed. FBEVAS train "B" was bypassed at approximately 0449 MST after it was confirmed that RU-145 was not providing a valid indication of radiological conditions. Subsequently, FBEVAS "A", CREFAS "A", and CREFAS "B"

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were reset. By approximately 0500 MST the normal fuel building and control building ventilation systems were returned to service and the control room essential filtration system and fuel building essential ventilation system were returned to standby readiness.

In response to the events described above, RU-145 was declared inoperable. The cause of the erroneous RU-145 indication was identified and appropriate work orders initiated to correct the problem. Pending implementation of the work orders, RU-144, RU-145, and RU-146 remained inoperable. On February 23 at 0051 RU-144 had been out of service for 72 hours. At approximately 0226 MST, RU-146 exceeded 72 hours out of service. Therefore, this report is also being submitted in accordance with Technical Specification 3.3.3.8 Action 42.b. The preplanned alternate sampling program was initiated in accordance with Technical Specification 3.3.3.8 Action 42.a.

At approximately 0520 MST, RU-143 was declared inoperable in preparation for performing the identified corrective action. The necessary corrective maintenance was performed on the radiation monitors. On February 23, 1990 at approximately 0307 MST RU-145 and RU-146 were declared operable. At approximately 1620 MST on February 23, 1990, RU-143 and RU-144 were declared operable.

- 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:

The cause of the high count rate on RU-145 was noise generated in RU-146 and conducted through the common ground of the radiation monitors.

Proper calibration of flow transmitters for the radiation monitor, RU-146 could not be accomplished due to low voltage at the transmitter. The 24 VDC power was originally routed from a power supply in the microcomputer unit, to a connection panel, then via an inverter/rectifier board to the transducer board. The modification to RU-146 bypassed the inverter/rectifier to increase the voltage at the transducer. The rectifier contained a filter capacitor that helped remove noise from the system. Therefore,

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after the modification, the filter capacitor no longer removed noise from the control system.

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

Noise generated in RU-146 caused a high radiation reading on RU-145 which initiated CREFAS and FBEVAS.

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

Not applicable- no component failure with multiple functions were involved.

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

RU-145 and RU-146 were declared operable at approximately 0307 MST on February 23, 1990. RU-146 was out of service for approximately 72 hours and 34 minutes. RU-145 was out of service for approximately 70 hours and 38 minutes.

RU-144 and RU-143 were declared operable at approximately 1620 MST on February 23, 1990. RU-144 was out of service approximately 87 hours and 29 minutes. RU-143 was out of service approximately 11 hours.

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

The spurious signal on RU-145 was discovered upon the initiation of the FBEVAS as described in section I.B.

- I. Cause of Event:

The cause of the radiation monitor high radiation indication was circuit noise as discussed in I.D.

The root cause of the event is under investigation in accordance with the PVNGS incident investigation program. The results of this investigation will be provided in a supplemental report.

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J. Safety System Response:

FBEVAS and CREFAS responded to the spurious signal as designed. The fuel building normal ventilation (VG) was isolated and the normal air handling units (AHU) were stopped. Train "A" and "B" fuel building essential air ventilation units started to control any release from the building. The control room normal ventilation (VI) isolated and normal air handling units stopped. Train "A" and "B" control room essential filtration units started.

K. Failed Component Information:

Not applicable - There were no component failures.

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

There were no safety consequences or implications resulting from the CREFAS and FBEVAS actuations. The Fuel Building Ventilation Monitor detects any activity released into the fuel building ventilation due to activities in the fuel building. The radiation monitor performs the safety function of initiating an isolation of normal ventilation systems and activating essential ventilation system on a HIGH-HIGH alarm. As discussed in Section I.B, there was no indication of abnormal radiation levels at the time of the event. Additionally, the fuel building was surveyed and no abnormal radiation levels existed.

III. CORRECTIVE ACTIONS:

A. Immediate

The FBEVAS "B" channel was bypassed after it was verified that the initiation signal was not valid.

A temporary modification was performed to the circuit of RU-144 and RU-146 to prevent circuit noise from causing the radiation monitors to indicate erroneously.

B. Action to Prevent Recurrence:

When the investigation into the event is complete, a supplement will be submitted providing recurrence control. The supplement will be submitted by April 30, 1990.

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IV. Previous Similar Event:

There have been several previous events attributed to radiation monitor spiking due to noise in the circuit. However, none were directly the result of modifying the circuit. Therefore, recurrence control could not have prevented this event.

