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RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-006-00:on 920419,spurious Train A containment purge isolation actuation sys initiated on balance-of-plant ESFAS. Caused by radiation monitor RU-37 dropping offline due to power supply failure.Power supply replaced.W/920509 ltr.

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Arizona Public Service Company
PALO VERDE NUCLEAR GENERATING STATION
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JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00784-JML/TRB/KR
May 9, 1992

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 1
Docket No. STN 50-528 (License No. NPF-41)
Licensee Event Report 92-006-00
File: 92-020-404

Attached please find Licensee Event Report (LER) No. 92-006-00 prepared and submitted pursuant to 10CFR50.73. This LER reports a Unit 1 spurious Train A Containment Purge Isolation Actuation System (CPIAS) actuation on the Balance of Plant Engineered Safety Features Actuation System. 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) 393-5421.

Very truly yours,

James M Levine

JML/TRB/KR/nk

Attachment

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

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LICENSEE EVENT REPORT (LER)

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

TITLE (4)

ESF Actuations Due To Radiation Monitor Failure

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

OPERATING MODE (9)	6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
POWER LEVEL (10)	0 0 0	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 - 5 4 2 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	I L	J X	K 0 2 0	N							

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)

On April 19, 1992, at approximately 0620 MST, Palo Verde Unit 1 was in Mode 6 (REFUELING) with the Reactor Coolant System at approximately 84 degrees Fahrenheit and at atmospheric pressure when a spurious Train A Containment Purge Isolation Actuation System (CPIAS) actuation was initiated on the Balance of Plant Engineered Safety Features Actuation System (BOP ESFAS). The Train A CPIAS resulted in the designed cross trips of Train B CPIAS and Trains A and B Control Room Essential Filtration Actuation System (CREFAS). The actuations occurred at the same time that the Channel A Containment Power Access Purge Exhaust Area Radiation Monitor (RU-37) dropped offline (i.e., lost communication) from the Radiation Monitoring System (RMS) minicomputer. At the time of the event, Containment purge and core alterations were in progress. The BOP ESFAS actuation resulted in close signals being sent to Containment Purge System isolation valves. Control Room and Radiation Protection personnel verified that normal radiation levels existed in the area monitored by RU-37 and in the Plant Vent exhaust. Core alterations were suspended. All operational equipment functioned as designed.

The cause of the CPIAS and CREFAS actuations and RU-37 dropping offline from the RMS minicomputer was due to a power supply failure in RU-37's remote indication and control (RIC) unit. The RIC unit's power supply was replaced.

There have been no previous events reported pursuant to 10CFR50.73 which resulted from the same root cause.

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

At 0620 MST on April 19, 1992, Palo Verde Unit 1 was in Mode 6 (REFUELING) during a scheduled refueling outage with the reactor coolant system (RCS) (AB) at approximately 84 degrees Fahrenheit and at atmospheric pressure.

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

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

At approximately 0620 MST on April 19, 1992, a spurious Train A Containment Purge Isolation Actuation System (CPIAS) (VA)(JE) actuation was initiated on the Balance of Plant Engineered Safety Features Actuation System (BOP ESFAS) (JE). The Train A CPIAS resulted in the designed cross trips of Train B CPIAS and Trains A and B Control Room Essential Filtration Actuation System (CREFAS) (VI). The actuations occurred at the same time that the Channel A Containment Power Access Purge Exhaust Area Radiation Monitor (RU-37) (VA)(IL)(RI) dropped offline (i.e., lost communication) from the Radiation Monitoring System (RMS) minicomputer (CPU)(IL). At the time of this event, Containment (NH) purge was in progress [four eight inch (8") Containment Purge System isolation valves (VA)(ISV) were open], and core alterations were in progress. The BOP ESFAS actuation resulted in close signals being sent to Containment Purge System isolation valves. Control Room (NA) personnel (utility, licensed) verified that radiation monitors adjacent to RU-37 were indicating normal radiation levels. Radiation Protection personnel (utility, nonlicensed) verified that normal radiation levels existed in the area monitored by RU-37 and in the Plant Vent (VL) exhaust. Core alterations were suspended. All operational equipment functioned as designed.

The BOP ESFAS actuations were identified by Control Room personnel as a result of main control board annunciations (ANN)(MCBD). The Shift Supervisor (utility, licensed) went to the BOP ESFAS RMS cabinets in the Control Room and discovered that RU-37's remote indication and control (RIC) unit (XIK) was deenergized. The Channel B Containment Power Access Purge Exhaust Area Radiation Monitor (RU-38) (VA)(IL)(RI) was indicating normal radiation levels. There were no operator actions which contributed to the cause of the event. No other ESF actuations occurred and none were required. Unit 1 personnel (utility, licensed and

nonlicensed) verified that the ESF actuations did not occur as a result of high radiation levels in the Containment Purge System.

At approximately 0720 MST on April 19, 1992, Train A CPIAS was placed in bypass for troubleshooting and maintenance on RU-37, and the remaining actuated equipment was secured, reset and returned to normal service. At approximately 0725 MST, containment purge via the four eight inch (8") Containment Purge System isolation valves was resumed. At approximately 0743 MST, core alterations were resumed.

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

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:

As described in Section I.B, a spurious Train A CPIAS actuation was initiated, and RU-37 dropped offline (i.e., lost communication) from the RMS minicomputer. Troubleshooting performed in accordance with an approved work authorization document and an engineering root cause of failure investigation performed in accordance with the APS Incident Investigation Program determined that the cause of the CPIAS and CREFAS actuations and RU-37 dropping offline from the RMS minicomputer was due to a power supply (JX) failure in RU-37's remote indication and control (RIC) unit (see Section I.E for a system description). The apparent cause of failure of the RIC unit's power supply was age-related. The power supply was provided as original equipment and had not been replaced since the RIC unit was installed. The failed component had been in service approximately 70,000 hours at the time of failure.

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

RU-37's field unit (detector and microcomputer) communicates with a dedicated microcomputer-controlled remote indication and control (RIC) unit located in a BOP ESFAS RMS cabinet in the Control Room. The RIC unit provides continuous remote indication at the Control Room BOP ESFAS RMS cabinet of the current radiation level and channel status. The RIC unit also communicates with the RMS minicomputer. The RIC unit automatically outputs a signal to the BOP ESFAS whenever a high-high radiation level setpoint is exceeded at the field unit.

TEXT

At approximately 0620 MST on April 19, 1992, the overvoltage protection circuit of the RIC unit's +5 volt power supply activated, resulting in the failure of the +5 volt power supply and the subsequent loss of the RIC unit's function. This resulted in a fail safe signal being output to the BOP ESFAS, and subsequent spurious Train A CPIAS actuation and communication loss of RU-37 with the RMS minicomputer.

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

Not applicable - RU-37 does not have multiple functions.

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:

RU-37 was declared inoperable at approximately 0620 MST on April 19, 1992 when the actuation was determined to be spurious. Following troubleshooting, replacement of the RIC unit's power supply, retest, and evaluation to ensure that there were no other problems, RU-37 was returned to service at approximately 1216 MST on April 23, 1992. RU-37 was inoperable approximately 4 days and 6 hours. Delays occurred when RU-37 remained downpowered in support of a plant modification to install seismic restraints on a radiation monitor in the same general area. During this time period, the Channel B Containment Power Access Purge Exhaust Area Radiation Monitor (RU-38) remained operable and would have initiated a high-high dose rate alarm initiation signal to BOP ESFAS if such an event occurred.

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

The RIC's power supply failure was discovered during troubleshooting performed in accordance with an approved work authorization document and an engineering root cause of failure investigation. There were no procedural errors which contributed to this event.

I. Cause of Event:

The cause of the event was due to a power supply failure in RU-37's remote indication and control (RIC) unit as described in Section I.D (SALP Cause Code E: Component Failure). No unusual characteristics of the work location (e.g., noise, heat, poor lighting) contributed to this event. The event was not a result of personnel errors or procedural errors.

J. Safety System Response:

The following safety system responses occurred:

- Containment Purge Isolation System (VA), Trains A and B,
- Control Room Essential Ventilation System (VI), Trains A and B,
- Essential Chilled Water System (KM), Trains A and B,
- Essential Cooling Water System (BI), Trains A and B, and
- Essential Spray Pond System (BS), Trains A and B.

K. Failed Component Information:

The failed component is a remote indication and control (RIC) unit's power supply manufactured by Kaman Sciences Corporation.

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

Channels A and B Containment Power Access Purge Exhaust Area Radiation Monitors (RU-37 and RU-38) are located outside Containment near the power access purge exhaust ducts (VA) (DUCT) and the refueling purge exhaust ducts. RU-37 and RU-38 monitor the purge exhaust ducts for purged airborne radioactivity concentrations that could potentially result in off-site doses exceeding 10CFR100 limits. RU-37 and RU-38 perform the safety function of monitoring purge exhaust and, if necessary, initiating a high-high dose rate alarm initiation signal to BOP ESFAS. BOP ESFAS performs the safety function of shutting the Containment Purge System isolation valves, activating Control Room Essential Ventilation, and starting necessary support systems (see Section I.J). As discussed in Section I.B, Unit 1 personnel verified that no actual high radiation levels existed. All components responding to the ESF actuation signals operated as designed.

The event did not result in any challenges to the fission product barriers or result in any releases of radioactive materials. Therefore, there were no other adverse safety consequences or implications as a result of this event. This event did not adversely affect the safe operation of the plant or the health and safety of the public.

III. CORRECTIVE ACTION:

A. Immediate:

As immediate corrective action, Unit 1 personnel verified that no abnormal radiation levels existed as described in Section I.B. Core alterations were suspended. In addition, the RIC unit's power supply was replaced.

B. Action to Prevent Recurrence:

An independent investigation of this event was conducted in accordance with the APS Incident Investigation Program.

The failure experienced in this event cannot be detected through normal testing. The failed component [i.e., a remote indication and control (RIC) unit's power supply] had been in service approximately 70,000 hours at the time of failure. APS Engineering determined that the service performance record was acceptable. APS has not previously experienced a similar age-related failure of the power supply. Therefore, APS has determined that a periodic replacement interval for the power supply need not be established at this time and that no further actions are required at this time to prevent recurrence.

IV. PREVIOUS SIMILAR EVENTS:

There have been no previous similar events reported pursuant to 10CFR50.73 which resulted from a failure of a remote indication and control (RIC) unit's power supply.