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FACIL:STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Publi 05000530
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BRADISH,T.R. Arizona Public Service Co. (formerly Arizona Nuclear Power
LEVINE,J.M. Arizona Public Service Co. (formerly Arizona Nuclear Power
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-005-00:on 910731,ESF actuation occurred.Caused by monitor failure.Corrective action included unit 3 personnel verifying that no abnormal radiation levels existed as described in section I.B.W/910823 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:Standardized plant. 05000530

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	NRR/DLPQ/LPEB10	1	1	NRR/DOEA/OEAB	1	1
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	NRR/DST/SICB8H3	1	1	NRR/DST/SPLB8D1	1	1
	NRR/DST/SRXB 8E	1	1	REG FILE 02	1	1
	RES/DSIR/EIB	1	1	RGN5 FILE 01	1	1
EXTERNAL:	EG&G BRYCE,J.H	3	3	L ST LOBBY WARD	1	1
	NRC PDR	1	1	NSIC MURPHY,G.A	1	1
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RIDS/ADDS

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

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

192-00736-JML/TRB/KR
August 23, 1991

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 3
Docket No. STN 50-530 (License No. NPF-74)
Licensee Event Report 91-005-00
File: 91-020-404

Attached please find Licensee Event Report (LER) No. 91-005-00 prepared and submitted pursuant to 10CFR50.73. 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/KR/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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13

NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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

TITLE (4)

ESF Actuation Due to 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 7	3 1	9 1	9 1	0 0 5	0 0	0 8	2 3	9 1	N/A	0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	1 0 0

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

	20.402(b)		20.405(c)	X	50.73(a)(2)(iv)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)
	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)

	73.71(b)
	73.71(c)
	OTHER *(Specify in Abstract below and in Text, NRC Form 366A)*

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Thomas R. Bradish, Compliance Manager	AREA CODE 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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	I L	R I	X 9 9 9	NO					

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 July 31, 1991, at approximately 0912 MST, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) at approximately 100 percent power, when a spurious Train A Containment Purge Isolation Actuation Signal (CPIAS) was initiated on the Balance of Plant Engineered Safety Features Actuation System. The Train A CPIAS resulted in the designed cross trips of Train B CPIAS and Trains A and B Control Room Essential Filtration Actuation Signals (CREFAS). The actuations occurred when the Train A Power Access Purge Area Radiation Monitor (RU-37) spiked above its high alarm/trip setpoint. At the time of the event, no containment purge was in progress and the Containment Purge System isolation valves were closed. All components operated as designed. Control Room and Radiation Protection personnel verified that normal radiation levels existed in the area monitored by RU-37.

The cause of RU-37 spiking above its high alarm/trip setpoint was an infantile failure of the monitor's Geiger-Muller tube in the detector assembly.

A previous similar event was reported in Unit 1 LER 528/91-005-00.

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

On July 31, 1991, at 0912 MST, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) at approximately 100 percent power.

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 0912 MST, on July 31, 1991, a spurious Train A Containment Purge Isolation Actuation Signal (CPIAS) (VA)(JE) 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 Signals (CREFAS) (VI). The actuations occurred when the Train A Power Access Purge Area Radiation Monitor (RU-37) (VA)(IL)(RI) spiked above its high alarm/trip setpoint. At the time of this event, no Containment (NH) purge was in progress and all Containment Purge System isolation valves (VA)(ISV) were closed. All components in the Control Room Essential Filtration System (VI) responded properly to the CREFAS. Control Room personnel (utility, licensed) verified that radiation monitors adjacent to RU-37 were indicating normal radiation levels. Radiation Protection personnel (utility, non-licensed) verified that normal radiation levels existed in the area monitored by RU-37 and in the Plant Vent (VL) exhaust.

The BOP ESFAS actuations resulted in close signals being sent to Trains A and B Containment Purge System isolation valves and resulted in the actuation of 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), and Trains A and B Essential Spray Pond System (BS). All components operated as designed.

The BOP ESFAS actuations were identified by Control Room personnel as a result of main control board annunciations (ANN)(MCBD). There were no operator actions which contributed to the cause of the event. No other ESF actuations occurred and none were required. Unit 3 personnel (utility, licensed and non-licensed) verified that the ESF actuations did not occur as a result of high radiation levels in the Containment Purge System.

At approximately 1150 MST, on July 31, 1991, Train A CPIAS and the remaining actuated equipment were secured, reset and returned to normal service.

At approximately 1756 MST on August 1, 1991, Train B CPIAS was returned to normal service and Train A CPIAS was placed in bypass for troubleshooting and maintenance on RU-37.

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. However, Train B CPIAS had been placed in bypass prior to this event for unrelated maintenance.

D. Cause of each component or system failure, if known:

The ESF actuations described in Section I.B were caused by the Train A Power Access Purge Area Radiation Monitor (RU-37) spiking above its high alarm/trip setpoint. Troubleshooting performed in accordance with an approved work authorization document and an engineering root cause of failure investigation determined that the cause of RU-37 spiking was an infantile failure of the monitor's Geiger-Muller (GM) tube in the detector assembly. This was a new GM tube that had been in service approximately 6 days at the time of the event. The detector channel and the detector assembly were inspected for physical causes of failure (e.g., loose connections, corrosion, bent pins). Inspection of the detector assembly internals discovered no signs of damage that would have caused the failure.

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

The infantile failure of the monitor's GM tube in the detector assembly resulted in the output of RU-37 spiking high. The spike was above the high alarm/trip setpoint for actuating a Train A CPIAS and subsequent actuation signals as described in Section I.B.

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

Not applicable - the Train A Power Access Purge Area Radiation Monitor (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:

Not applicable - the malfunction in the Train A Power Access Purge Area Radiation Monitor (RU-37) did not render a train of a safety system inoperable.

RU-37 was declared inoperable at approximately 0912 MST, on July 31, 1991 when the actuation was determined to be spurious. Following replacement of the detector assembly, retest, and evaluation to ensure that there were no other problems, RU-37 was returned to service at approximately 1137 MST, on August 15, 1991. RU-37 was inoperable approximately 15 days and 2 hours. Delays occurred while obtaining necessary components.

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

The GM tube 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 identified.

I. Cause of Event:

The cause of the event was an infantile failure of RU-37's GM tube in the detector assembly 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 Geiger-Mueller tube, Model 713, manufactured by LND, Inc. The tube is purchased from ASI, Inc.

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

Trains A and B Power Access Purge 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 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 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 3 personnel verified that no actual high radiation levels existed. In addition, Containment Purge System isolation valves were shut at the time of the event. All components responding to the ESF actuation signals operated as designed. Therefore, there were no safety consequences or implications resulting from this event.

III. CORRECTIVE ACTION:

A. Immediate:

As immediate corrective action, Unit 3 personnel verified that no abnormal radiation levels existed as described in Section I.B. The malfunctioning detector was replaced in accordance with an approved work authorization document.

B. Action to Prevent Recurrence:

PVNGS system engineering personnel (utility, non-licensed) are currently monitoring work by the detector assembly vendor (ASI) and the GM tube manufacturer (LND) to determine if action can be taken to reduce the rate of detector failures in these monitors.

FACILITY NAME	DOCKET NUMBER	LER NUMBER			PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Palo Verde Unit 3	0 5 0 0 0 5 3 0	9 1	— 0 0 5	— 0 0	0 6 OF 0 6

TEXT

IV. PREVIOUS SIMILAR EVENTS:

A previous similar event was reported in Unit 1 LER 528/91-005-00. The LER discussed an event wherein an infantile failure of a GM tube in the detector assembly caused the radiation monitor to spike above its actuation point causing an ESF actuation. There is no testing or action available which will identify infantile detector failure prior to its occurrence. Therefore, actions taken prior to this event would not be expected to prevent this event.