

# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8708250142      DOC. DATE: 87/08/20      NOTARIZED: NO      DOCKET #  
 FACIL: STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Publi      05000529  
 AUTH. NAME      AUTHOR AFFILIATION  
 BRADISH, T. R.      Arizona Nuclear Power Project (formerly Arizona Public Serv  
 HAYNES, J. G.      Arizona Nuclear Power Project (formerly Arizona Public Serv  
 RECIP. NAME      RECIPIENT AFFILIATION

SUBJECT: LER 87-008-00: on 870722, plant shutdown initiated due to  
 suspected steam generator tube leak in SG2. Caused by manual  
 trip by util operator due to loss of main feedwater pumps  
 Night order written to instruct operators. W/870820 ltr.

DISTRIBUTION CODE: IE22D      COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: Standardized plant. M. Davis, NRR: 1Cy.

05000529

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD5 LA	1 1	PD5 PD	1 1
	LICITRA, E	1 1	DAVIS, M	1 1
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADS	1 0
	NRR/DEST/CEB	1 1	NRR/DEST/ELB	1 1
	NRR/DEST/ICSB	1 1	NRR/DEST/MEB	1 1
	NRR/DEST/MTB	1 1	NRR/DEST/PSB	1 1
	NRR/DEST/RSB	1 1	NRR/DEST/SGB	1 1
	NRR/DLPQ/HFB	1 1	NRR/DLPQ/QAB	1 1
	NRR/DOEA/EAB	1 1	NRR/DREP/RAB	1 1
	NRR/DREP/RPB	2 2	NRR/PMAS/ILRB	1 1
	REG FILE 02	1 1	RES DEPY GI	1 1
	RES-TEEFORD, J	1 1	RES/DE/EIB,	1 1
	RGN5 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1

NOTES: 1 1

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 5 2 1 9 1 OF 0 1 5										PAGE (3) 1 OF 0 1 5			
TITLE (4) Manual Reactor Trip Initiated Due to the Loss of Both Main Feedwater Pumps																							
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	2	2	8	7	8 7	0 0	8	0 0	8	2	0	8	7	N/A					0 5 0 0 0				
OPERATING MODE (9) 1			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																				
POWER LEVEL (10) 0 5 6			20.402(b)				20.405(c)				<input checked="" type="checkbox"/> 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)(ix)												
LICENSEE CONTACT FOR THIS LER (12)																							
NAME Thomas R. Bradish, Compliance Supervisor										TELEPHONE NUMBER AREA CODE 6 0 2 3 9 3 - 1 3 5 3 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)										EXPECTED SUBMISSION DATE (15)					MONTH	DAY	YEAR						
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO													

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

At approximately 1842 MST on July 22, 1987, Palo Verde Unit 2 was in Mode 1 (POWER OPERATION) when a plant shutdown was initiated due to a suspected steam generator (SG) tube leak in SG 2. At approximately 1850 MST, the plant was at approximately 56 percent power when utility licensed operators manually tripped the reactor after both main feedwater pumps tripped on low suction pressure. All systems and components operated as designed.

The cause of the reactor trip was a manual trip by a utility licensed operator due to a loss of main feedwater pumps. The cause of the loss of main feedwater pumps was due to a personnel error by the licensed operator in that he placed the condensate demineralizer bypass valve in automatic before closing the condensate demineralizer outlet valve. This caused a reduction in condensate flow to the main feedwater pumps which resulted in the loss of both main feedwater pumps and the initiation of a manual reactor trip. Placing the condensate demineralizer bypass valve into automatic prior to closing the condensate demineralizer outlet valve is contrary to an approved procedure.

As corrective action to prevent recurrence, a night order was written to instruct operators to leave the bypass valve in manual in the event all condensate demineralizers are removed from service. No similar events have occurred.

8708250142 870820  
PDR ADDCK 05000529  
S PDR

122  
11

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

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

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

At approximately 1842 MST on July 22, 1987, Palo Verde Unit 2 was in Mode 1 (POWER OPERATION) when a plant shutdown was initiated due to a suspected steam generator (SG)(AB) tube (TBG) leak in SG2. At approximately 1850 MST, the plant was at approximately 56 percent power when utility licensed operators manually tripped the reactor (RCT)(AC) after both main feedwater pumps (P)(SJ) tripped on low suction pressure. All systems and components operated as designed.

Prior to the initiation of the plant shutdown, the deborating ion exchanger (IX)(CB) was being vented following a resin replacement. Primary coolant, in accordance with procedure, was used to fill the deborating ion exchanger and is then allowed to flow out of the ion exchanger vessel (VSL) through a vent valve (VTV). The overflow was directed to the non engineered safety feature (ESF) sump through the radioactive drain (DRN) system. The radioactive gases from the venting process were routed through the auxiliary building (NF) vent system (VF) to the plant vent system (VL).

The sink (SNK) and floor drains in the chemistry hot lab drain to the same radioactive drain system header that was being used during the deborating ion exchanger venting process. A portion of the radioactive gases from the ion exchanger migrated upwards through the radioactive drain system to the floor and sink drains in the chemistry hot lab. This caused radiation levels in the vicinity of SG1 and SG2 blowdown sample monitors (RU-4 and RU-5 respectively)(RI)(IL), which are located in the chemistry hot lab, to increase past the high alarm setpoints for both monitors (approximately 2.96 E-6 microcuries/cubic centimeter). As a result, RU-5 alarmed in the control room (RU-4 did not alarm in the control room due to being off-line to the radiation monitoring system (RMS)(IL) mini computer (CPU) at the time of the event).

When RU-5 alarmed in the control room, utility licensed operators suspected a SG tube leak in SG2. A 15 minute gross leak rate estimate for the Reactor Coolant System (RCS)(AB) indicated that approximately a 1 gallon per minute leak existed. The Shift Supervisor (utility-licensed) informed the Unit 2 Superintendent (utility-licensed) of these preliminary indications and it was decided to commence a plant shutdown. A plant shutdown was initiated at approximately 1842 MST in accordance with procedure.

Based on existing radiological conditions, Chemistry requested, with the shift supervisor's concurrence, that it would be a prudent measure to bypass the condensate demineralizers (KD) to prevent the demineralizer resins from being contaminated. At approximately 1845 MST an utility licensed operator manually opened the condensate demineralizer bypass valve (PCV) and began placing the condensate demineralizer in standby. After placing all (6) the condensate demineralizers in standby, the operator returned the condensate demineralizer bypass valve to automatic.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

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

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

The condensate demineralizer bypass valve, which modulates to maintain the appropriate demineralizer differential pressure, attempted to maintain the differential pressure setpoint, and modulated closed which caused a reduction in condensate flow to the main feedwater pumps.

The reduction in condensate flow resulted in both main feedwater pumps tripping on low suction pressure at approximately 1850 MST. The reactor was manually tripped from 56 percent power to prevent the unnecessary challenge of the Engineered Safety Features. The cause of the trip was a manual trip by the utility licensed operator due to a loss of main feedwater pumps. The cause of the loss of main feedwater pumps was due to a personnel error by the licensed operator in that the condensate demineralizer bypass valve should not have been returned to automatic before the condensate demineralizer outlet valve (V) was closed. The bypass and outlet valves are interlocked such that with the outlet valve closed the bypass valve will stay in the full open position. Returning the condensate demineralizer bypass valve to automatic before closing the condensate demineralizer outlet valve is contrary to an approved procedure.

As immediate corrective action, a night order was written to instruct operators to maintain the condensate bypass valves in manual in the event all condensate demineralizers are removed from service. Additionally, Chemistry will evaluate the need to bypass the demineralizers in the event of a SG tube leak. If bypassing the demineralizers is considered necessary, the steam generator tube leak procedure will be revised to include the steps required to take the condensate demineralizer package out of service.

The event was diagnosed as an uncomplicated reactor trip. Plant conditions were stabilized in Mode 3 (HOT STANDBY) by approximately 1902 MST. There were no automatic or manual safety system responses except as described above. There were no structures, systems, or components inoperable at the start of this event that contributed to the event except as described above. The duration of this event was approximately 12 minutes. There were no unusual characteristics of the work location that contributed to the event. The following is a time line showing the sequence of events.

SEQUENCE OF EVENTSTIMEACTION

1830*	Deborating Ion Exchanger Venting In Progress
18:31:52*	RU-5 Alert Alarm
18:42*	Rapid Shutdown of Plant Initiated
18:45*	Condensate Demineralizer Bypass Valve Opened in Manual/Then Placed in Auto
18:49:57*	FW Pump A Suct Press Lo
18:49:58*	FW Pump B Suct Press Lo
18:50:11:365,	FWPT "B" Tripped

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

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

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

18:50:17:449	Master Turbine Trip
18:50:20:888	FWPT "A" Tripped
18:50:25:965	Remote Man RPS CH "D" Trip
18:50:25:977	Remote Man RPS CH "C" Trip
18:50:26:009	CH "D" Trip CKT BRK POS Trip
18:50:26:026	CH "C" Trip CKT BRK POS Trip
18:50:26:035	CEDM Power Bus UNDV 1
18:50:26:036	CEDM Power Bus UNDV 3
18:50:26:037	CEDM Power Bus UNDV 4
18:50:26:038	CEDM Power Bus UNDV 2
18:50:26:558	CH "A" Trip CKT BRK POS Trip
18:50:26:560	CH "B" Trip CKT BRK POS Trip
18:50:52*	Aux Fwp AFBPO1 Started
18:51:26*	Aux Fwp AFNPO1 Started
19:00*	Event Classification of Reactor Trip, Uncomplicated
19:02*	Commenced RCS Cooldown
19:36:23*	RCP 2A & RCP 2B Secured
20:43*	RCPS 2A and 2B Restarted

## \*NOTE NON-SOE ALARMS:

The Sequence of Events (SOE) alarm processing program runs on the Plant Monitoring System (PMS)(ID) with the highest priority. SOE (non-asterisk) alarm times are considered to be accurate. Non-SOE are accumulated in memory buffers. As PMS Central Processing Unit (CPU) time becomes available, the buffered data is output to the alarm typer. For that reason, the times associated with information received from the Non-SOE alarm typer may not reflect actual times of events.

On previous occasions the auxiliary buildings of both operating units have experienced migration of radioactive gases. The greatest source of radioactive gases in the auxiliary building is the radioactive drain system. The radioactive drain system acts as a transfer path between different levels in the auxiliary building. This is caused by a lack of loop seals or the equivalent in the radioactive drain system. Additionally, the 140 foot level of the auxiliary building is the most negative pressure of any other level in the building. Therefore any radioactive gas released in the building migrates to the 140 foot level. An Engineering Evaluation Request (EER) has previously been written to evaluate the need to add loop seals, float valves, and/or flapper valves to prevent the radioactive drain system from acting as a transfer path. Adjusting the auxiliary building air balance or redesigning the auxiliary building air distribution system to ensure that the airflow relationship between floors is from top to bottom is currently being evaluated.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/88

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

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

As discussed previously, RU-4 was off-line to the RMS mini computer. When RU-4 was called up on an RMS monitor histogram, the indication showed no abnormal activity. The operators believed that activity was high in only one SG which resulted in control room personnel to suspect a SG tube leak. A human performance evaluation will be initiated to evaluate alternative methods for alerting RMS users that radiation monitors are not providing current data.

Chemistry samples taken after the reactor trip confirmed that a primary to secondary leak did not exist therefore this event did not impact the safe operation of the plant or the health and safety of the public. No similar events have been reported.



## Arizona Nuclear Power Project

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

192-00261-JGH/TRB/MJC

August 20, 1987

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


Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Unit 2  
Docket No. 50-529  
Licensee Event Report 87-008-00  
File: 87-020-404

Dear Sirs:

Attached please find Licensee Event Report (LER) No. 87-008-00 prepared and submitted pursuant to 10CFR 50.73. In accordance with 10CFR 50.73(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, Compliance Supervisor at (602) 393-3531.

Very truly yours,

  
for J. G. Haynes  
Vice President  
Nuclear Production

JGH/MJC/cld

Attachment

cc: O. M. DeMichele (all w/a)  
E. E. Van Brunt, Jr.  
J. B. Martin  
R. C. Sorenson  
E. A. Licitra  
A. C. Gehr  
INPO Records Center

1522  
11