

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8806090228 DOC. DATE: 88/06/02 NOTARIZED: NO DOCKET #
 FACIL: STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Public 05000529
 AUTH. NAME AUTHOR AFFILIATION
 SHRIVER, T. D. Arizona Nuclear Power Project (formerly Arizona Public Ser.
 HAYES, J. G. Arizona Nuclear Power Project (formerly Arizona Public Ser.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-005-02: on 880221, inadvertent safety injection from
 safety injection Tanks occurred due to low pressurizer
 pressure signals not being properly bypassed, caused by
 personnel error. Appropriate action to be taken. W/880602 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: Standardized plant.

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
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	NRR/DEST/ADS 7E	1 0	NRR/DEST/CEB 8H	1 1
	NRR/DEST/ESB 8D	1 1	NRR/DEST/ICSB 7	1 1
	NRR/DEST/MEB 9H	1 1	NRR/DEST/MTB 9H	1 1
	NRR/DEST/PSB 8D	1 1	NRR/DEST/RSB 8E	1 1
	NRR/DEST/SGB 8D	1 1	NRR/DLPQ/HFB 10	1 1
	NRR/DLPQ/QAB 10	1 1	NRR/DOEA/EAB 11	1 1
	NRR/DREP/RAB 10	1 1	NRR/DREP/RPB 10	2 2
	NRR/DRIS/SIB 9A	1 1	NUDOCS-ABSTRACT	1 1
	<u>REG FILE</u> 02	1 1	RES TELFORD, J	1 1
	RES/DE/EIB	1 1	RES/DRPS DEPY	1 1
	RGN5 FILE 01	1 1		
EXTERNAL:	EG&G WILLIAMS, S	4 4	FORD BLDG HOY, A	1 1
	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

TOTAL NUMBER OF COPIES REQUIRED: LTTR 47 ENCL 46

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 5 2 9 1					PAGE (3) 1 OF 0 4					
TITLE (4) Inadvertent Safety Injection Resulting From Personnel Error																				
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	1	8	8	8	8	0	0	5	0	2	0	6	0	2	8	8	N/A	0 5 0 0 0
OPERATING MODE (9) 5			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(e)				X 50.73(a)(2)(iv)				73.71(b)					
			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)(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 Timothy D. Shriver, Compliance Manager										TELEPHONE NUMBER 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 NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC										
X	B	P	F	U	G 1 8 2	Y														
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)																				
<p>This is a supplement to LER 2-88-005-01.</p> <p>On February 21, 1988, Palo Verde Unit 2 was in Mode 5 (COLD SHUTDOWN) at approximately 170°F and 125 psia being cooled-down and depressurized to begin a refueling outage. At approximately 0719 MST an inadvertent safety injection (JE) from the Safety Injection Tanks (BP)(ACC) occurred as a result of low pressurizer pressure signals not being properly bypassed. The safety injection was accompanied by a containment isolation (BP)(JE) engineered safety features (ESF) actuation. There were no other ESF actuations and none were necessary. During the event a high pressure safety injection (HPSI) valve (INV) did not fully open. All other equipment operated per design.</p> <p>The root cause of the event was a cognitive personnel error on the part of utility, licensed personnel. Additionally during the event, the HPSI loop injection valve did not open due to a blown fuse (FU).</p> <p>As corrective action, appropriate disciplinary measures will be taken. The HPSI loop injection valve was verified to operate properly after replacing the malfunctioning fuse. The cause of the fuse opening could not be determined. Further testing was conducted and it was determined that the fuse failure was random and that the existing fuse specification is adequate.</p> <p>There have been no previous similar occurrences.</p>																				

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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 8	— 0 0 5 —	0 2	0 2	OF	0	4

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

This is a supplement to LER 2-88-005-01.

At approximately 0719 MST on February 21, 1988, Palo Verde Unit 2 was in Mode 5 (COLD SHUTDOWN) at approximately 170°F and 125 psia when a low pressurizer (PZR) pressure trip signal caused an inadvertent Safety Injection Actuation Signal (SIAS)(BP)(JE) and Containment Isolation Actuation Signal (CIAS)(JE). This resulted in an inadvertent safety injection into the reactor coolant system (RCS)(AB) from the Safety Injection Tanks (SIT)(ACC). At approximately 0802 MST a Notification of Unusual Event was declared due to the injection of water into the RCS. The Notification of Unusual Event was terminated at the time of declaration (0802 MST). There were no other Engineered Safety Features (ESF)(JE) actuations and none were necessary.

On February 21, 1988, Palo Verde Unit 2 was in the process of being cooled-down and depressurized for the start of a refueling outage. The cooldown/depressurization was being conducted in accordance with procedure 420P-2ZZ10, "Hot Standby to Cold Shutdown - Mode 3 to Mode 5." In accordance with 420P-2ZZ10, the high pressure safety injection pumps (HPSI)(BQ)(P) had been removed from service (electrical power disabled), the low pressure safety injection pumps (LPSI)(BP) had been aligned for shutdown cooling, and the SIT isolation valves (ISV) closed (but not disabled). No safety injection flowpaths were required to be operable in accordance with Technical Specifications after Unit 2 entered Mode 5 at approximately 0316 MST on February 21, 1988.

On the shift prior to the one during which the ESF actuation occurred, it was identified that the low pressurizer pressure channel "C" trip was not operating properly. The channel was bypassed and a work request document was initiated to have the channel repaired. During a subsequent investigation into the problems with pressurizer pressure channel "C", control room personnel (utility, licensed) observed the bypass indication for channel "C" and incorrectly noted that all four (i.e. 4 of 4) low pressurizer pressure trip channels were bypassed. The requirement for bypassing the four pressurizer pressure trip channels was then documented as being complete in 420P-2ZZ10.

At 0700 MST on February 21, 1988, on-coming shift personnel (utility, licensed) continued the cooldown/depressurization in accordance with 420P-2ZZ06, "Mode 5 Operations." At approximately 0713 Low Pressurizer Pressure Channel A, B, and D pre-trips were received. The cooldown/depressurization continued as it had previously been documented that the four low pressurizer pressure trips were bypassed. At approximately 0719 MST, Low Pressurizer Pressure Channel B and D trips were received and SIAS and CIAS were initiated.

Containment isolation (CIAS) is required to minimize the release of radioactive material during a loss-of-coolant-accident (LOCA) or main steamline break. The CIAS initiates isolation of the process lines

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penetrating the containment by actuating the appropriate valves when 2-out-of-4 high containment pressure initiation signals or 2-out-of-4 low pressurizer pressure initiation signals are received by CIAS actuation logic.

The Safety Injection System provides emergency core cooling by injecting borated water into the reactor coolant system. This limits core damage and assures an adequate shutdown margin should a LOCA or steamline break occur. The SIAS is initiated by receipt of 2-out-of-4 low pressurizer pressure or 2-out-of-4 high containment pressure signals. Following an incident which results in a SIAS, the high pressure safety injection pumps, low pressure safety injection pumps, and high and low pressure injection valves (INV)(including the SIT isolation valves (ISV)) receive actuation signals.

During the safety injection described herein, approximately 10 percent safety injection tank volume was injected into the reactor coolant system (approximately 962 cubic feet). This increased RCS pressure to approximately 250 psig and pressurizer level to approximately 100 percent. The HPSI pumps did not actuate since they had been electrically disconnected prior to entering Mode 5 and the LPSI pumps were already operating for shutdown cooling. All other equipment operated as designed except as discussed below.

Following the SIAS/CIAS, control room personnel (utility, licensed) in accordance with approved procedural controls, responded to the event and determined that the SIAS/CIAS was inadvertent. Control room personnel verified that all equipment operated as designed for the current plant conditions with the exception of a high pressure safety injection loop isolation valve (ISV) not fully opening. By approximately 0830 MST the actuated equipment had been restored to normal configuration for Mode 5 operations and the event was terminated.

The root cause of this event has been determined to be a sequence of two cognitive personnel errors. The first personnel error was as a result of the pressurizer low pressure trips being documented as being placed in bypass by control room personnel (utility, licensed) when only channel "C" was in bypass. The second cognitive personnel error was a result of control room personnel (utility, licensed) not properly responding to the low pressurizer pressure pre-trip alarms and terminating the cooldown/depressurization until the cause of the pre-trip alarms was investigated. Procedural controls were evaluated and it was determined that the personnel errors were not as a result of an error in approved procedures or the activities not being covered by approved procedures. There were no unusual characteristics of the work location which contributed to the event.

The cause of the high pressure safety injection (HPSI) valve not fully opening was determined to be a blown fuse (FU). Troubleshooting revealed that there was no indication of a ground on the circuit and after installation of a new fuse, the HPSI valve operated properly. A root cause investigation was conducted and the reason for the fuse opening could not be determined as the

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U.S. NUCLEAR REGULATORY COMMISSION

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EXPIRES: 8/31/88

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

fuse was not retained for the root cause investigation. Therefore, additional testing was performed in a manner to simulate the conditions present during the event described herein. This testing was performed to ensure that the fuse currently specified is appropriate for its intended function. As a result of the additional testing, it was determined that the current fuse specification is appropriate. The cause of the fuse opening was therefore determined to be random fuse malfunction.

As corrective action to prevent recurrence, appropriate disciplinary measures will be taken. Additionally this event will be reviewed by control room personnel in all three units as additional training. An investigation was conducted which did not identify any contributory causes, therefore, ANPP believes the corrective actions described herein should be sufficient to prevent recurrence. However, personnel errors such as those described above are closely monitored. If a trend is identified, additional corrective actions will be initiated.

No safety limits were approached and no fission product barriers were challenged. There were no structures, systems, or components inoperable at the start of the event which contributed to the event other than described above. The Safety Injection Tanks, Low Pressure Safety Injection System, and High Pressure Safety Injection System are not required to be operable in Mode 5. The malfunctioning high pressure safety injection valve did not affect the capability of the safety injection system to perform its intended function since there are other flowpaths available to inject borated water into the RCS (for example, redundant injection flowpaths into alternate RCS loop penetrations). All other components operated per design. Other than the personnel errors described above, the operators' actions were correct and in accordance with procedural controls. Based upon the above, there were no safety consequences or implications resulting from this event and there was no threat to the health and safety of the public.

There have been no previous similar occurrences.

This report is also provided in accordance with Emergency Plan Implementing Procedure (EPIP)-03 for the Notification of Unusual Event described herein.

Fuse Information:

Manufacturer: Gould Circuit Protection Division, Newburyport Maine
Model No.: SHAMUT TRIONIC TR 2.5R



Arizona Nuclear Power Project

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

192-00378-JGH/TDS/DAJ

June 2, 1988

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529 (License NPF-51)
Licensee Event Report 2-88-005-02
File: 88-020-404

Attached please find Supplement No. 2 to Licensee Event Report (LER) No. 88-005-01 prepared and submitted pursuant to the requirements of 10CFR 50.73(d). We are herewith forwarding a copy of this report to the Regional Administrator of the Region V Office.

If you have any questions, please contact T. D. Shriver, Compliance Manager at (602) 393-2521.

Very truly yours,



J. G. Haynes
Vice President
Nuclear Production

JGH/TDS/DAJ/kj

Attachment

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

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