

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9802190104 DOC. DATE: 98/02/10 NOTARIZED: NO DOCKET #
 FACIL: STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Publi 05000529
 AUTH. NAME AUTHOR AFFILIATION
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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-007-00: on 971006, TS violation occurred due to
 inadequate shutdown cooling flow during Modes 5 & 6
 operation. Independent investigation of this was conducted
 IAW APS CA program. W/980210 ltr.

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

NOTES: Standardized plant.

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192-01011 -GRO/DGM/KR
February 10, 1998

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
License No. NPF-51
Licensee Event Report 97-007-00.

Attached please find Licensee Event Report (LER) 97-007-00 prepared and submitted pursuant to 10CFR50.73. This LER reports a Technical Specification violation due to inadequate shutdown cooling flow during Modes 5 and 6 operation. In accordance with 10CFR50.73(d), a copy of this LER is being forwarded to the Regional Administrator, NRC Region IV. If you have any questions, please contact Daniel G. Marks, Section Leader, Nuclear Regulatory Affairs, at (602) 393-6492.

Sincerely,

GRO/DGM/KR/mah

Attachment

cc: E. W. Merschoff (all with attachment)
K. E. Perkins
J. H. Moorman
INPO Records Center

9802190104 980210
PDR ADDCK 05000529
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 5 2 9	PAGE (3) 1 OF 0 5
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TITLE (4)
TS violation due to inadequate shutdown cooling flow during Modes 5 and 6 operation

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 NUMBERS	
									N/A	0 5 0 0 0 0	
1	0	6	9	7	- 0 0 7 - 0 0 0 2 1 0 9 8				N/A	0 5 0 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		20.402(b)		20.405(c)		50.73(a)(2)(v)		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)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 368A)			
		20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(vii)(A)					
		20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)					
		20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(v)					

LICENSEE CONTACT FOR THIS LER (12)	
NAME Daniel G. Marks, Section Leader, Nuclear Regulatory Affairs	TELEPHONE NUMBER AREA CODE 6 0 2 3 9 3 - 6 4 9 2

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		

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)

From September 30, 1997, at approximately 1455 MST to October 6, 1997, at approximately 1155 MST, Palo Verde Unit 2 was in Modes 5 and 6 (COLD SHUTDOWN and REFUELING), when shutdown cooling flow requirements specified in Technical Specification Limiting Condition for Operation (TS LCO) 3.4.1.4 and TS LCO 3.9.8 were not being met. Approximately 400 gpm of flow were bypassing the reactor core due to a shutdown cooling bypass valve not being fully seated when it was stroked closed on September 30, 1997 at approximately 1455 MST. Upon discovery, Control Room personnel closed the valve and initiated actions to reestablish the TS required shutdown cooling flow at approximately 1155 MST on October 6, 1997. Since Unit 2 had been shutdown for a refueling outage, the decay heat load was minimal and available shutdown cooling flow was more than adequate to remove decay heat under existing conditions.

No previous similar events have been reported pursuant to 10CFR50.73.

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TEXT

1. REPORTING REQUIREMENT:

This LER 529/97-007-00 is being written to report an event that resulted in an operation or condition prohibited by the plant's Technical Specifications (TS) as specified in 10 CFR 50.73(a)(2)(i)(B).

At approximately 1455 MST on September 30, 1997, Palo Verde Unit 2 was in its seventh refueling outage in Mode 6 (REFUELING). At approximately 0310 MST on October 6, 1997, Palo Verde Unit 2 entered Mode 5 (COLD SHUTDOWN).

TS Limiting Condition for Operation (LCO) 3.4.1.4 (applicable in Mode 5) and TS LCO 3.9.8 (applicable in Mode 6) require shutdown cooling (BP) loop(s) shall be in operation. Associated surveillance requirements (SR) require that, for the shutdown cooling loop(s) to be OPERABLE, it must be circulating reactor coolant (AB) at a flow rate greater than or equal to 3780 gpm.

Contrary to the requirements of TS, from approximately 1455 MST on September 30, 1997 until approximately 1155 MST on October 6, 1997, Palo Verde Unit 2 was operated in Modes 5 and 6 with approximately 3480 gpm of shutdown cooling flow, which is less than the required 3780 gpm. Immediately upon discovery of the condition by Control Room personnel, actions were initiated to reestablish the required shutdown cooling flow.

2. EVENT DESCRIPTION:

On October 6, 1997, Palo Verde Unit 2 Control Room personnel were conducting a draindown to midloop condition to support the removal of the steam generator (SG) (AB) nozzle dams when a level anomaly of approximately eight inches was noted between Channel A and Channel B reactor water level indicating system (RWLIS) wide range indicators. Even though the difference between the two indicators was within the acceptable tolerance, Control Room personnel stopped draining the RCS just prior to entering the midloop condition and requested resolution of the level discrepancy prior to resuming the drain down. At this time, Unit 2 was in shutdown cooling with Train B containment spray (BE) pump in service. Shutdown cooling flow indicated 3870 gpm when Control Room personnel stopped draining the RCS.

During troubleshooting activities, Control Room personnel verified that the shutdown cooling bypass valve SIBUV690 was fully seated by operating the valve's hand switch in the closed direction. By design, SIBUV690 indicates closed prior to the valve being torqued closed. Valve indication in the Control Room comes from a limit switch assembly in the

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valve actuator as opposed to a torque switch. To address this design, the operating procedures require the hand switch to be held in the closed direction for five seconds after the valve indicates closed.

After operating the SIBUV690's hand switch, the RWLIS wide range level anomaly terminated but shutdown cooling flow indicated 3480 gpm. Approximately 400 gpm of shutdown cooling flow had been diverted from the reactor core, flowing back to the suction of the operating shutdown cooling pump. Since shutdown cooling flow is measured upstream of the bypass line, there was no indication to Control Room personnel that actual flow to the core was low. Actual shutdown cooling flow has an effect on water level measurement. Since actual shutdown cooling flow was less than indicated flow, an incorrect error correction factor affecting RWLIS Channels A and B wide range indicators was used in determining water level.

At approximately 1455 MST on September 30, 1997, SIBUV690 was operated in the closed position when the Train B containment spray system was aligned for shutdown cooling. At approximately 2000 MST on October 5, 1997, shutdown cooling flow had been lowered to what was indicated to be just above the TS limit. With approximately 400 gpm of flow bypassing the reactor core, actual flow to the reactor core dropped to less than the 3780 gpm, violating the requirements of TS LCO 3.9.8 (Mode 6) and TS LCO 3.4.1.4 (Mode 5). This condition was corrected at approximately 1155 MST on October 6, 1997, when the shutdown cooling bypass valve was fully shut and Control Room personnel increased the flow to above the TS limit.

APS acknowledges that the report date is greater than 30 days from the event date. The discussion addressing the difference is as follows: On October 6, 1997, when indicated shutdown cooling flow dropped below 3780 gpm, Control Room personnel entered TS LCO 3.4.1.4.2 ACTION a which states "With less than the above required loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible." Control Room personnel immediately increased shutdown cooling flow to 3900 gpm. At that time, APS believed that full compliance with TS was maintained throughout the event in that restoration of shutdown cooling flow was performed within the TS allowed outage time (i.e., corrective action to return the required loops to OPERABLE status as soon as possible). APS responded as such on November 26, 1997 to the NRC Inspection Report 50-528/529/530/97-16 and the Notice of Violation (NOV) (cited as a violation of TS 3.4.1.4.2) dated October 29, 1997. However, on January 12, 1998, the NRC responded stating that shutdown cooling flow through the reactor core was less than 3780 gpm and, therefore, compliance with the TS was not met. The NRC further stated that they cannot support the premise that the time between occurrence and

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the implementation of the corrective action was less than the allowed outage time, nor can they support the premise that the allowed outage time should have been calculated based on the time of actual discovery (instead of the time of occurrence). Therefore, APS is submitting this LER to report an operation or condition prohibited by the plant's TS.

There were no safety system actuations and none were required.

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

Since Unit 2 had been shutdown for approximately 30 days for a refueling outage, the safety consequence of this event was minor. The cold midloop evolution was being conducted near the end of the outage with a newly refueled reactor core. The decay heat load was minimal and available shutdown cooling flow was more than adequate to remove decay heat under existing conditions.

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

4. CAUSE OF THE EVENT:

An independent investigation of this event was conducted in accordance with the APS Corrective Action Program. As part of the investigation, a determination of the cause of the event was performed. The investigation determined that APS missed the opportunity to prevent this event by ineffectively addressing past industry operating experience (SALP Cause Code X: Other). Two factors were identified that contributed to this event: the closed valve position indication for the shutdown cooling bypass valve and the procedure guidance to verify cooling flow were not sufficient to provide a positive method of determining or verifying shutdown cooling flow rate through the reactor core.

No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event.

5. STRUCTURES, SYSTEMS, OR COMPONENTS INFORMATION:

There are no indications that any structures, systems, or components were inoperable at the start of the event which contributed to this event. No component or system failures were involved. No failures of components

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with multiple functions were involved. No failures that rendered a train of a safety system inoperable were involved.

6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

An independent investigation of this was conducted in accordance with the APS Corrective Action Program. Actions to prevent recurrence were developed based upon the results of the investigation and are being tracked to completion under the PVNGS Commitment Action Tracking System. These actions which have been previously docketed in the reply to Notice of Violation 50-529/97-16-01 (dated November 26, 1997) include: providing a reliable means of determining local valve position indication for the shutdown cooling bypass valves, revising appropriate SR procedures to provide a positive method to determine and verify shutdown cooling flow through the reactor core, and industry events training for Control Room personnel.

7. PREVIOUS SIMILAR EVENTS:

No other previous events have been reported pursuant to 10 CFR 50.73 where shutdown cooling flow failed to meet TS LCO requirements as a result of a partially opened shutdown cooling bypass valve in the last three years.

