



Palo Verde Nuclear
Generating Station

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192-01071-WEI/AKK/REB

September 27, 2000

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
License No. NPF-51
Licensee Event Report 2000-003-00**

Attached please find Licensee Event Report (LER) 50-529/2000-003-00 prepared and submitted pursuant to 10 CFR 50.73. This LER reports a condition prohibited by the Technical Specifications when the required surveillance requirement to verify the emergency core cooling system full was not met. This letter makes no commitments to the NRC.

In accordance with 10CFR50.73(d), a copy of this LER is being forwarded to the Regional Administrator, NRC Region IV and the Resident Inspector. If you have questions regarding this submittal, please contact Daniel G. Marks, Section Leader, Regulatory Affairs, at (623) 393-6492.

Sincerely,

WEI/AKK/REB/kg

Attachment

cc: E. W. Merschoff (all with attachment)
J. H. Moorman
M. B. Fields
INPO Records Center

IE22

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)
Palo Verde Nuclear Generating Station Unit 2

DOCKET NUMBER (2)
05000529

PAGE (3)
1 OF 4

TITLE (4)
ECCS Surveillance Requirement Not Met Due to Inadequate Procedure

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 NAME	DOCKET NUMBER
07	23	2000	2000	003	00	09	27	2000	N/A	
									N/A	

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 100	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)			
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)			
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71			
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER			
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)					Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME Daniel G. Marks, Section Leader, Nuclear Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 623-393-6492
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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 15 single-spaced typewritten lines) (16)

On July 23, 2000 with Unit Two operating in MODE 1, Power Operation, at approximately 100 percent power, shift operations personnel were venting the B train high pressure safety injection (HPSI) system to meet a technical specification (TS) surveillance requirement (SR). During the venting it was discovered the system contained an unusual amount of gas. Subsequent evaluation determined the B train had been partially voided by nitrogen due to safety injection tank (SIT) water leaking past HPSI injection valves. Since the SIT is maintained with a nitrogen cover gas at approximately 600 psig, the water became saturated with nitrogen which came out of solution when the water leaked past the HPSI valves into the lower pressure piping upstream of the cold leg injection valve. The SR verifies every 31 days that the system is full of water. However, the HPSI valves had been leaking and it is believed the B train experienced nitrogen voiding that was not completely vented every 31 days. Engineering personnel determined the B train remained capable of performing its safety function in the partially voided condition.

The cause of this condition has been attributed to an inadequate surveillance test procedure when SIT backleakage occurs. Corrective actions include more frequent venting of the B train and a procedure change to require more extensive venting if gas is observed during the performance of the surveillance test. PVNGS has not reported similar events in the last three years.

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LICENSEE EVENT REPORT (LER)

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

1. REPORTING REQUIREMENT(S):

This LER (50-529/2000-003-00) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B), to report a condition prohibited by the Technical Specifications (TS). Specifically, TS Surveillance Requirement (SR) 3.5.3.2 required the emergency core cooling system (ECCS) (EIS Code: BP) to be verified full of water every 31 days. However, the surveillance test performed to meet this SR was inadequate to verify the B train of the high pressure safety injection (HPSI) (EIS Code: BQ) was full of water when safety injection tank (SIT) (EIS Code: BP) water leaked past HPSI system valves into the lower pressure piping upstream of a HPSI cold leg injection valve.

This LER is being submitted more than 30 days after the event date due to the time required to determine the amount of gas in the system, the impact of the gas on the system, and the reportability of the condition.

2. DESCRIPTION OF STRUCTURE(S), SYSTEM(S) AND COMPONENT(S):

The ECCS is divided into two subsystems; HPSI and low pressure safety injection (LPSI) (EIS:BP), to provide core cooling and negative reactivity to ensure that the reactor core is protected after certain accidents.

There were no structures, components, or systems that were inoperable at the start of the event that contributed to the event.

3. EVENT DESCRIPTION:

On July 23, 2000 with Unit Two operating in MODE 1, Power Operation, at approximately 100 percent power, shift operations personnel were venting the B train HPSI system to meet SR 3.5.3.2 (Verify ECCS piping is full of water) when it was discovered the system contained an unusual amount of gas. The surveillance test (ST) procedure used to meet the SR required the B train to be vented from four separate vent valves, with each valve located immediately upstream of an associated HPSI cold leg injection valve. The procedure stated that if an unusually large amount of air was encountered then the shift manager was to be notified.

The operations crew decided to further vent the B train by using two vent valves (2PSIBV041, 2PSIBV042) further upstream in the system. One of the valves required approximately five minutes of venting in a throttled position and the other valve required approximately one minute of venting in a throttled position to get water out the vents. System engineering estimates that approximately six cubic feet of gas was vented from the system. Subsequent evaluation determined that the B train had been partially voided by nitrogen due to SIT water leaking back into the HPSI B train through two check valves (2PSIEV542, 2PSIEV133) and a HPSI cold leg injection valve (2JSIBUV636). Since the SIT is maintained with a nitrogen cover gas at approximately 600 psig, the water became

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saturated with nitrogen which came out of solution when the water leaked past the valves into the lower pressure piping upstream of the cold leg injection valve. The SIT leakage was quantified in August 1999 at approximately 10 gallons per day and had increased to approximately 17.5 gallons per day on July 23, 2000. However, it is not known how much of this leakage was into the B train HPSI system.

4. ASSESSMENT OF SAFETY CONSEQUENCES:

System engineering determined that the HPSI B train remained capable of performing its safety function during this condition. The purpose of the SR is to maintain the piping from the ECCS pumps to the reactor coolant system (RCS) (EIS Code: AB) full of water to ensure the system will perform properly, injecting its full capacity into the RCS upon demand and will prevent water hammer, pump cavitation, and pumping of noncondensable gas into the reactor vessel.

A pipe stress design engineer and the safety injection system engineer performed a walkdown of the Unit 2 HPSI B discharge piping from the pump to the pipe supports associated with HPSI cold leg injection valve 2JSIBUV636. No indications of damaged pipe supports, damaged snubbers, crushed piping insulation, or other marks identifying piping movements were noted. Since the pipe support system is the first location water hammer damage is expected to be found, and no evidence of damage was found, the previous venting frequency does not appear to have impacted the pipe supports' ability to maintain system operability.

Enough margin exists in the safety analysis to support that the system response time was capable of meeting the safety analysis injection requirements with the gas bubble that had accumulated in the B train HPSI system.

Nitrogen entering the reactor vessel during a large break loss of coolant accident has already been analyzed for in the safety analysis and is not a concern. For small break loss of coolant accidents, the small amount of nitrogen gas in the system would have a negligible impact to heat transfer and natural circulation.

The voiding was limited to the discharge piping of the B train HPSI system therefore, gas binding and cavitation of the HPSI pump did not occur.

This condition did not constitute a condition that would have prevented the fulfillment of a safety function as described by 10CFR50.73(a)(2)(IV) and is therefore not a safety system functional failure.

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5. CAUSE OF THE EVENT:

An independent investigation of this event is being conducted in accordance with the APS corrective action program. Although additional investigative activities remain to be completed, a preliminary evaluation has determined the apparent cause to be a degraded HPSI injection valve (allowed SIT backleakage) combined with an inadequate surveillance test procedure. With the SIT backleakage into the lower pressure portion of the system the procedure did not require more extensive venting of the HPSI system if gas was observed at the first vent point.

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

6. CORRECTIVE ACTIONS TO PREVENT RECURRENCE:

The B train HPSI system venting frequency has been increased to once per week due to the SIT water leakage into the HPSI system discharge piping. In addition, the ST procedure has been modified to require more extensive venting if any gas is observed at the first vent point.

The HPSI injection valve (2JSIBUV636) is scheduled to be repaired during the next refueling outage, which starts September 30, 2000.

The A and B trains of HPSI for Units One and Three and the A train HPSI for Unit Two have been verified to be full using the revised ST procedure. There is no known SIT water leakage in these trains of the HPSI system.

7. PREVIOUS SIMILAR EVENTS:

PVNGS has not reported previous events in which the ECCS piping was found to have been voided.

8. ADDITIONAL INFORMATION:

NRC Information Notice (IN) 97-40, Potential Nitrogen Accumulation Resulting From Backleakage From Safety Injection Tanks, was reviewed by system engineering in December 1997. The result from the review of the IN was that the applicable HPSI piping would be vented following any SIT fill evolution that occurs due to SIT leakage during power operation. The TS SR to maintain the ECCS full was not considered during this evaluation.