10CFR50.73

APS
Palo Verde Nuclear
Generating Station

A subsidiary of Pinnacle West Capital Corporation

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102-05316-DMS/CKS/DJS
August 3, 2005

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

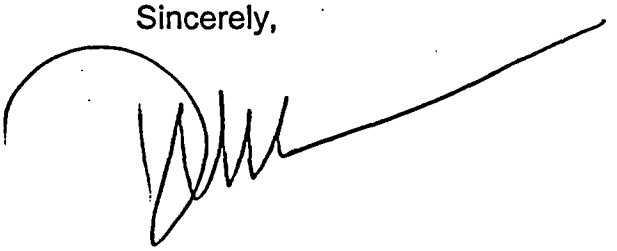
Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
License No. NPF-51
Licensee Event Report 2005-002-00

Attached please find Licensee Event Report (LER) 50-529/2005-002-00 prepared and submitted pursuant to 10 CFR 50.73. This LER reports an event resulting in a Technical Specification violation when a mode change occurred with one of two required Low Pressure Safety Injection (LPSI) trains being inoperable due to a degraded mechanical pump seal.

In accordance with 10 CFR 50.4, a copy of this LER is being forwarded to the NRC Region IV Office and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Daniel G. Marks, Section Leader, Regulatory Affairs, at (623) 393-6492. Arizona Public Service Company makes no commitments in this letter.

Sincerely,



DMS/CKS/DJS/ca
Attachment

cc: B. S. Mallet NRC Region IV Administrator (all w/attachment)
M. B. Fields NRC NRR Project Manager for PVNGS
G. G. Warnick NRC Senior Resident Inspector for PVNGS

IE22

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Palo Verde Nuclear Generating Station (PVNGS) Unit 2	05000529	1 OF 6

4. TITLE

T/S 3.0.4 Violation; mode change made with one of two required LPSI pumps inoperable

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
06	10	2005	2005	- 002 -	00	08	??	2005	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

3

10. POWER LEVEL

000

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Daniel G. Marks, Section Leader, Regulatory Affairs	623-393-6492

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
A	BP	SEAL	D272	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

This LER reports an event resulting in a Technical Specification violation when a mode change occurred with one of two required Low Pressure Safety Injection (LPSI) trains unknowingly inoperable due to a degraded mechanical pump seal. On May 16, 2005 at approximately 09:50 hours MST Unit 2 entered MODE 3 with pressurizer pressure greater than or equal to 1837 psia while LPSI pump 'A' had a degraded mechanical seal. This is contrary to LCO 3.0.4 which precludes entry into a MODE or other specified condition in the Applicability statement when an LCO is not met. LCO 3.5.3 requires two Emergency Core Cooling Systems to be Operable in Modes 1, 2, and in Mode 3 when pressurizer pressure is greater than or equal to 1837 psia or when RCS cold leg temperature is greater than or equal to 485 degrees Fahrenheit.

There have been three previous similar licensee events reported in the last three years.

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Palo Verde Nuclear Generating Station Unit 2	05000529	2005	-- 002	-- 00	2 OF 6

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

1. REPORTING REQUIREMENT(S):

This LER 50-528/2005-002-00 is being reported under 10 CFR 50.73(a)(2)(i)(B), Operation or Condition Prohibited by the Technical Specifications. Specifically, on May 16, 2005 at approximately 09:50 hours MST Unit 2 unknowingly entered a specified condition (reactor coolant system (RCS)(AB) pressure > 1837 psia) with Low Pressure Safety Injection (LPSI) pump 'A' that had a degraded mechanical seal,(EIIS: BP-SEAL). This is contrary to LCO 3.0.4 which precludes entry into a MODE or other specified condition in the Applicability statement when an LCO is not met. LCO 3.5.3 requires two Emergency Core Cooling Systems (ECCS)(BP) to be Operable in Modes 1, 2, and in Mode 3 when pressurizer (AB) pressure is greater than or equal to 1837 psia or RCS cold leg temperature is greater than or equal to 485 degrees Fahrenheit.

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

The function of the ECCS is to provide core cooling and negative reactivity to ensure that the reactor core (AC) is protected after certain accidents. Two redundant, 100% capacity trains are provided with each train consisting of High Pressure Safety Injection (HPSI)(BQ) and Low Pressure Safety Injection (LPSI)(BP) subsystems. In MODES 1, 2, and 3, with pressurizer pressure greater than or equal to 1837 psia or with RCS cold leg temperature greater than or equal to 485°F, both trains are required to be OPERABLE to ensure that 100% of the core cooling requirements can be provided in the event of a single active failure.

3. INITIAL PLANT CONDITIONS:

On May 17, 2005, Unit 2 was in Mode 3 (HOT STANDBY), at zero percent power.

There were no components or systems inoperable at the time of this event that affected this event other than the condition being reported.

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

4. CHRONOLOGY OF RELEVANT EVENTS:

On May 17, 2005, during plant startup, a leak was discovered at the LPSI pump 'A' mechanical seal. Upon discovery, the pump was declared INOPERABLE at 00:30 AM, MST. The pump had been shut down in MODE 4 (HOT SHUTDOWN) and subsequently, entry into MODE 3 was made. The Unit was in MODE 3 when the degraded seal condition was discovered.

On June 10, 2005, Mechanical Maintenance Engineering determined the cause of the seal degradation was inadequate venting of the seal prior to one or more pump starts while the Unit was in MODE 5. Therefore, after the fact, there was no firm evidence that the LPSI A pump was operable when applicable LCO 3.5.3 Mode 3, greater than or equal to 1837 psia conditions were entered on May 16, 2005, at 09:50 AM, a violation of Technical Specification 3.0.4.

Additionally, at the time of discovery, Unit 2 entered the appropriate Tech Spec LCO 3.5.3 and remained in Mode 3 until LPSI A was restored to service on May 18, 2005 10:20 PM a total of 60 hours and 30 minutes. This is less than the 7 days of inoperability allowed by LCO 3.5.3 Required Action A.1.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

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

The condition would not have prevented the fulfillment of the safety function and did not result in a safety system functional failure as defined by 10CFR50.73(a)(2)(v).

The condition did not result in a transient more severe than those analyzed in the Updated Final Safety Evaluation Report Chapters 6 and 15. The condition did not have any nuclear safety consequences, or personnel safety impact.

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

6. CAUSE OF THE EVENT:

Apparent Cause: air accumulation in the seal flush water lines apparently interfered with the supply of water to the seal faces allowing the seal to overheat and degrade.

The seal assembly is supplied with high pressure, clean, cooling water through the 'flush port' in the gland plate (inboard of the seal faces). The flush port injection line is piped from the LPSI pump's cyclone filter which is external to the pump. The cyclone filter is a high point in the injection line and is vented by means of a valve (valve designator 2PSIAV997). This valve vents the cyclone filter, the injection line, and the seal assembly. The injection lines were not blocked or obstructed, as they were verified the clear during the seal replacement.

The LPSI A pump was started six times between April 18, 2005 when the seal was replaced and May 17, 2005 when the evidence of leakage was observed in the pump room. Prior to the first two starts, the pump was vented at valve 2PSIAV977, which is considered a vent point only addressed by procedure when bringing the pump out of a maintenance activity or at the discretion of the Control Room Supervisor. It was not procedurally required to vent at 2PSIA977 and therefore not vented at that location prior to the next four starts creating the possibility that air entrained in the system accumulated in the cyclone separator while the pump was shut down and caused seal degradation during one or more of the last four pump starts. There is no evidence to conclusively indicate the observed degradation occurred with any single pump start.

The photograph on the following page illustrates the equipment discussed in this report.

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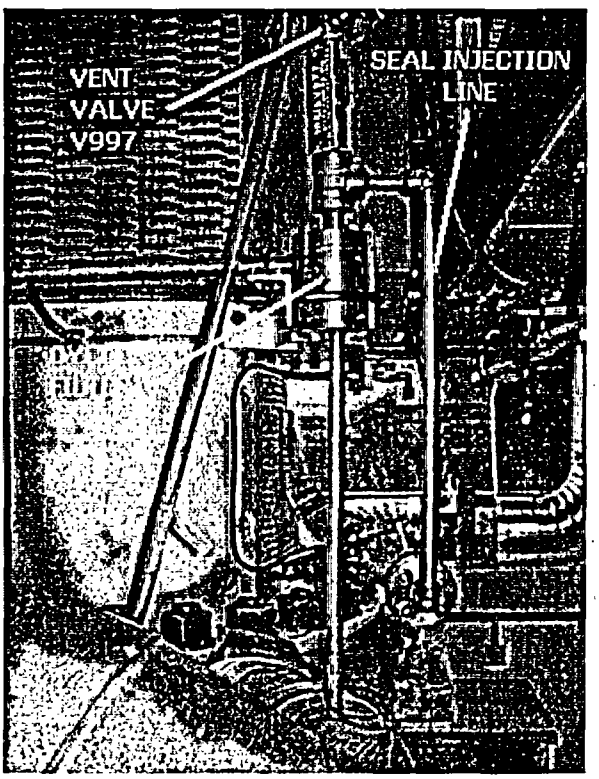
17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

PHOTO : Cyclone Filter / High Point Vent



If the completed investigation report includes information which would substantively change the reader's perception of the event, an LER supplement will be submitted.

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

7. CORRECTIVE ACTIONS:

- A corrective maintenance work order (CM #2800334) was initiated for the leaking mechanical seal and the LPSI 'A' Pump was repaired on May 18, 2005. The mechanical seal was removed, disassembled, inspected, rebuilt, and reinstalled using in-house Mechanical Maintenance procedure 31MT-9SI01.
- CRAI #2819014 has been generated to require Operations to vent the cyclone filter prior to each manual LPSI or Containment Spray (CS) (EIIS: BE) pump start.

8. PREVIOUS SIMILAR EVENTS:

There have been three previous similar licensee events reported in the last three years.

LER 50-530/2003-003-00 reported a condition in which a technical specification violation occurred when required reactor power instrumentation was not calibrated as required by surveillance requirements. The cause of the event was human performance error by control room licensed operators who did not recognize the change in acceptance criteria when power was reduced below 80 percent.

LER 50-528/2004-002-00 reported a condition in which power was raised above 20 percent rated thermal power without meeting the Limiting Condition for Operation (LCO) for Axial Shape Index (ASI). The cause was determined to be that control room operators had incorrectly interpreted a provisional note in procedures.

LER 50-528/2005-002-00 reported an event resulting in a technical specification violation when a mode change occurred with a safety injection valve not in its required position. Preliminary investigation results indicated the cause of the event to be cognitive personnel error.

The previously implemented corrective actions from these three previous events would not have prevented this occurrence from happening.