



A subsidiary of Pinnacle West Capital Corporation

10 CFR 50.73

Palo Verde Nuclear
Generating Station

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102-06306-DCM/DFH
January 18, 2011

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

Dear Sirs:


Subject: Palo Verde Nuclear Generating Station (PVNGS) Unit 3
Docket No. STN 50-530
License No. NPF-74
Licensee Event Report 2010-003-00

Enclosed please find Licensee Event Report (LER) 50-530/2010-003-00 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER reports a condition prohibited by Technical Specification (TS) 3.7.7, "Essential Cooling Water (EW) System," associated with a degraded air handling unit for EW train A pump room.

In accordance with 10 CFR 50.4, copies of this LER are being forwarded to the Nuclear Regulatory Commission (NRC) Regional Office, NRC Region IV and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Marianne Webb, Section Leader, Regulatory Affairs, at (623) 393-5730.

Arizona Public Service Company makes no commitments in this letter.

Sincerely,



FOR D.C. MIMS

DCM/MNW/DFH/gat

Enclosure

cc: E. E. Collins Jr.	NRC Region IV Regional Administrator
J. R. Hall	NRC NRR Senior Project Manager - (electronic / paper)
L. K. Gibson	NRC NRR Project Manager (electronic / paper)
M. A. Brown	NRC Senior Resident Inspector for PVNGS

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LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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.

1. FACILITY NAME

Palo Verde Nuclear Generating Station (PVNGS) Unit 3

2. DOCKET NUMBER

05000530

3. PAGE

1 OF 5

4. TITLE

Essential Cooling Water System Train A Inoperable due to Degraded Room Air Handling Unit

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
11	11	2010	2010	- 003 -	00	01	18	2011	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

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

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below
or in NRC Form 366A |

10. POWER LEVEL

100

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

Marianne Webb, Section Leader, Regulatory Affairs

TELEPHONE NUMBER (Include Area Code)

623-393-5730

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
B	VF	FCU	A220	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)

On November 15, 2010, at approximately 0952 Mountain Standard Time (MST), during the monitoring of quarterly vibration measurements, increased vibration levels were noted on the essential cooling water (EW) system train A pump room air handling unit (AHU). After further evaluation, it was determined that reasonable assurance did not exist that the supporting AHU would meet its mission time of 30 days. Accordingly, on November 16, 2010, at 2245 MST, Unit 3 Operations personnel declared the EW train A inoperable due to the degraded EW pump room AHU and entered Condition A of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.7.

The condition was caused by several machined steps in the fan shaft that reduced the diameter of the shaft under the outboard fan bearing on the AHU. This condition subsequently led to the degradation of the outboard fan bearing. The bearing was replaced and Unit 3 exited TS LCO 3.7.7, Condition A, on November 18, 2010, at 1847 MST.

No similar conditions have been reported by Palo Verde in the past three years.

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NARRATIVE

All times are Mountain Standard Time and approximate unless otherwise indicated.

1. REPORTING REQUIREMENT(S):

This LER is being submitted pursuant to 10 CFR 50.73 (a)(2)(i)(B) as a condition prohibited by Technical Specification (TS) 3.7.7, "Essential Cooling Water (EW) System," when a degraded EW train A pump room air handling unit (AHU) (3MHAAZ05) rendered the associated EW pump inoperable for a period greater than the TS required action time.

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

The EW system (EIS Code: BI) consists of two separate, independent, redundant, closed loop, safety-related trains. These trains supply corrosion inhibited cooling water to components that are required for normal and emergency shutdown. Each train is capable of providing 100 percent of the cooling water flow required for a safe reactor shutdown or following a loss of coolant accident. During normal plant operation the EW system is not operating, but is in a standby condition for automatic actuation.

Each train of the EW system provides cooling water for the following safety-related components: shutdown cooling heat exchangers (one per train), and essential chillers (one per train). As such, when one train of the EW system is inoperable, the associated supported trains of the shutdown cooling system (EIS Code: BP) and the essential chilled water system (EC) (EIS Code: KM) are also inoperable. In addition, the EC system provides the required chilled water flow for the following systems: control room essential ventilation system, engineered safety features switchgear, electrical penetration room cooling system, engineered safety features equipment room cooling system, auxiliary feedwater pump room cooling system, and essential cooling water pump room cooling system.

Each EW pump room has one AHU that supplies cooling and circulating air. The AHU ensures operation of the EW pump and associated equipment under design accident heat loads.

3. INITIAL PLANT CONDITIONS:

On November 15, 2010, Palo Verde Unit 3 was in Mode 1 (Power Operation), at 100 percent power, at normal operating temperature (NOT) and normal operating pressure (NOP). There were no structures, systems, or components inoperable at the time of the event that contributed to the event.

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4. EVENT DESCRIPTION:

On November 15, 2010, during the monitoring of quarterly vibration measurements, increased vibration levels were recorded for the EW system train A room AHU. Based on the preliminary vibration data, an immediate operability determination completed by Operations personnel concluded that the AHU was capable of meeting equipment operability requirements. To validate their conclusion, Operations personnel requested an engineering evaluation of the vibration data. Upon completion of the evaluation, engineering personnel determined that reasonable assurance did not exist that the supporting AHU would meet its mission time of 30 days.

Accordingly, on November 16, 2010, at 2245, Unit 3 Operations personnel declared the EW Train A inoperable due to the degraded AHU and entered Condition A of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.7. Due to EW system support functions, Operations personnel also declared the following systems inoperable and entered the associated actions: EC train A, emergency core cooling system (ECCS) train A, shutdown cooling (SDC) train A, containment spray (CS) train A, auxiliary feedwater (AF) train A and control room essential air temperature control system (CREATCS) train A. At this time, Operations personnel performed a safety function determination that demonstrated there was no loss of safety function as a result of the increased AHU levels.

Subsequent troubleshooting revealed the outboard fan bearing on the AHU was degraded. The bearing was replaced and Unit 3 exited Condition A of TS LCO 3.7.7 and the associated cascading actions on November 18, 2010, at 1847.

Engineering personnel determined that prior to this event, in July 2008, the outboard fan bearing for the AHU had been replaced due to an increase in vibration levels. The new bearing replaced the original bearing installed by the AHU manufacturer in 1981. During the replacement of the original bearing, the fan shaft was noted to have several machined steps that reduced the diameter of the fan shaft under the outboard bearing. This condition was evaluated and was considered to be acceptable since vibration values with the new bearing were within levels established in the Palo Verde vibration program and the original bearing had functioned for 27 years on the machined shaft.

In April 2009, the vibration on the AHU increased and in February 2010, an inspection found the inboard bearing setscrews were loose. Once tightened, the fan vibration decreased. Subsequent quarterly vibration data collected in March, May and August 2010, revealed vibration levels had not increased. The AHU operated routinely to support testing since February 2010, and was used to support plant conditions during the refueling outage in October and November 2010.

As described above, on November 15, 2010, during quarterly vibration monitoring, elevated vibration levels were noted and resulted in the removal of the AHU from service on

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November 16, 2010, to replace the bearing. Prior to the November 15, 2010, the AHU last operated with acceptable vibration levels on November 11, 2010. Therefore, APS conservatively assumed that the AHU could not have supported EW train A operability since November 11, 2010.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

The safety consequence of the known degraded AHU was minimal since best estimate analysis has demonstrated the EW pump has been capable of operating for greater than 24 hours without room cooling. Following the initial 24 hours of operation, compensatory measures to keep the room temperature within acceptable limits could have been implemented.

There were no inoperable structures, systems, or components at the time of the event that contributed to this event. The event did not result in any challenges to the fission product barriers or result in the release of radioactive materials. There were no actual safety consequences as a result of this condition. Since EW train B remained operable from November 11, 2010, and during the event, the condition does not represent a reportable safety system functional failure under 10 CFR 50.73 (a)(2)(v).

6. CAUSE OF THE EVENT:

The cause of the degraded AHU outboard bearing was that the fan shaft was machined with several machined steps reducing the diameter of the shaft at the end under the location of the outboard bearing race. The shaft diameter at the location of the bearing inner race set screws is approximately 0.026 inch smaller than the inner diameter of the inner bearing race. The inner bearing race is secured to the shaft with two setscrews, 120 degrees apart, and when the screws are tightened, the bearing race is pushed into the machined section of the shaft. This caused the shaft to be offset in the race by the depth of the groove, creating a built-in non-concentricity.

7. CORRECTIVE ACTIONS:

Based on the result of the equipment investigation the following corrective actions have been taken or are planned to prevent recurrence:

- The EW train A pump room AHU fan outboard bearing was replaced.
- A new shaft for AHU 3MHAAZ05 is being procured.
- Replacement of the shaft has been scheduled for installation during the next available opportunity.
- Increased vibration monitoring of the AHU will be performed until the shaft is replaced.

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Additionally, an extent of condition evaluation of the AHUs supplied by the same equipment manufacturer, concluded the machining error that resulted in a reduced diameter fan shaft under the outboard bearing was limited to the Unit 3, EW train A pump room AHU.

Any additional corrective actions taken as a result of the investigation of this event will be implemented in accordance with the APS corrective action program.

8. PREVIOUS SIMILAR EVENTS:

No similar conditions have been reported by Palo Verde in the past three years.