



A subsidiary of Pinnacle West Capital Corporation

10 CFR 50.73

Palo Verde Nuclear
Generating Station

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102-06638-DCM/DFH
December 28, 2012

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 2012-003-00

Enclosed please find Licensee Event Report (LER) 50-529/2012-003-00 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER reports a condition prohibited by Technical Specifications when Unit 2 entered Mode 3 operations with one Auxiliary Feedwater train inoperable.

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 Mark McGhee, Operations Support Manager, Regulatory Affairs, at (623) 393-4972.

Arizona Public Service Company makes no commitments in this letter.

Sincerely,



FOR D. C. MIMS

DCM/DFH/hsc

Enclosure

cc: E. E. Collins Jr. NRC Region IV Regional Administrator
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 2	2. DOCKET NUMBER 05000529	3. PAGE 1 OF 5
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4. TITLE

Entry into Mode 3 with one Auxiliary Feedwater Train 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
11	2	2012	2012	- 003 -	00	12	28	2012	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 3	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)			
10. POWER LEVEL 0	<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	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Mark McGhee, Operations Support Manager, Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 623-393-4972
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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

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 02, 2012, with Unit 2 in Mode 3 following refueling activities, Operations personnel entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.5, Condition A, when the turbine driven Auxiliary Feedwater (AF) pump (AFA-P01) was declared inoperable to support surveillance testing per procedure 73ST-9AF04, AFA-P01 Full Flow-Inservice Test. During the test, a steam leak was identified on AFA-P01 steam supply valve SGA-UV-138. The valve had been disassembled and reassembled during the refueling outage to correct seat leakage. Testing was secured and Operations personnel declared valve SGA-UV-138 inoperable. Since TS LCO 3.7.5 requires three AF trains to be operable in Modes 1, 2, and 3, and one of the steam supply valves for AFA-P01 was inoperable, TS LCO 3.0.4 was not met when Unit 2 entered Mode 3 at 00:07 on November 2, 2012.

As an immediate corrective action, Operations personnel closed valve SGA-UV-138 to stop the leak and placed Unit 2 in Mode 5 to allow the valve repairs. The cause was determined to be inadequate work instructions for valve re-assembly. To prevent recurrence, work instructions will be revised to provide detailed guidance for valve re-assembly and to require verifications of proper re-assembly.

In the past three years, PVNGS has not reported a similar event to the NRC.

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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), to report a condition prohibited by Technical Specification (TS) Limited Condition for Operation (LCO) 3.0.4 when Palo Verde Nuclear Generating Station (PVNGS) Unit 2 entered Mode 3 with the TS LCO 3.7.5 requirements for Auxiliary Feedwater (AF) not met. LCO 3.7.5, Auxiliary Feedwater (AF) System requires that three AF trains shall be OPERABLE for Modes 1, 2 and 3.

The steam driven AF pump, AFA-P01, was inoperable due to a condition which would result in steam leakage whenever steam supply valve SGA-UV-138 was opened. LCO 3.0.4 requires that when an LCO is not met, entry into a Mode or other specified condition in the Applicability shall only be made:

- When the associated Actions to be entered permit continued operation in the Mode or other specified condition in the Applicability for an unlimited period of time.
- After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate; exceptions to this Specification are stated in the individual Specifications, or
- When an allowance is stated in the individual value, parameter, or other Specification.

None of these requirements were met; therefore, this represents a condition prohibited by TS.

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

The AF System consists of one essential motor driven AF pump "B" (EIS code: BA, P, MO), one essential steam turbine driven AF pump "A" (EIS code: BA, P, TRB), and one non-essential motor driven AF pump "N" (EIS code: BA, P, MO), configured into three trains. The AF System ensures availability of residual heat removal capability for all events accompanied by a loss of offsite power and a single failure.

Feedwater is automatically supplied to the steam generators (SG)(EIS Code: SG) upon the loss of normal feedwater supply and subsequent low steam generator water level. The steam generators function to remove decay heat from the Reactor Coolant System (EIS Code: AB) by releasing steam to the atmosphere via the Main Steam Safety Valves (MSSVs) or Atmospheric Dump Valves (ADVs). When offsite power is available, decay heat can be removed by steam release to the main condenser via the Steam Bypass Control Valves.

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Each essential AF pump provides 100 percent of the required flow capacity to the steam generators to remove decay heat and cool the unit to Shutdown Cooling (SDC) System entry conditions. The non-essential AF pump is used during normal unit startup, shutdown, and hot standby conditions and provides sufficient feedwater to remove decay heat under no load conditions and to cool the unit to SDC entry conditions. The two motor driven AF pumps receive electric power from one of the two 4.16 KV safety related buses. The steam turbine driven AF pump receives steam from either steam generator's main steam lines upstream of the main steam isolation valves (MSIV). Each steam supply line is capable of supplying 100 percent of the required steam flow for the steam turbine driven AF pump and is configured with a supply valve which is actuated by the Auxiliary Feedwater Actuation Signal (AFAS).

The two steam supply valves (SGA-UV-134 and SGA-UV-138) for steam turbine driven AF pump "A" are 125 VDC motor operated, 6 inch gate valves. The valves are located in the Main Steam Support Structure and are installed with the bonnet and valve actuator assembly at a 45 degree angle from vertical to allow for access to the valve actuator. Each is interlocked with a 1.5 inch, motor operated bypass valve (SGA-UV-134A and SGA-UV-138A). When the steam turbine driven AF pump is started, the small bypass valve opens prior to the larger 6 inch supply valve to allow controlled turbine acceleration on startup and prevent turbine overspeed. The large 6 inch steam supply valves then open after a nominal time delay to provide full steam supply capability.

The steam supply valves also function as containment isolation valves that are open during accident conditions. These valves do not receive a closure signal following receipt of a Containment Isolation Actuation Signal but are automatically opened to support the AF system function. The valves may be remotely opened or closed by Operations personnel with controls in the control room or the remote shutdown panel.

3. INITIAL PLANT CONDITIONS:

On November 2, 2012, at 11:33, PVNGS Unit 2 was in Mode 3, Hot Standby. Reactor coolant system temperature and pressure were being increased in preparation for planned equipment testing at normal operating temperature and pressure following refueling.

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

4. EVENT DESCRIPTION:

On October 23, 2012, during refueling outage 2R17 with Unit 2 in Mode 5, scheduled work was performed on turbine driven AF pump steam supply valve SGA-UV-138 to correct a valve seat leakage condition. The work activity required disassembly and re-assembly of the valve and was completed later on the same day. Post maintenance valve testing could

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not be completed at that time because the plant was at cold shutdown conditions and the testing required normal hot standby steam pressure conditions in Mode 3.

At 00:07 on November 02, 2012, Unit 2 entered Mode 3 as Operations personnel conducted activities to heatup and pressurize the RCS following refueling activities. Operations personnel entered TS LCO 3.7.5, Condition A, at 09:30, when steam driven AF pump, AFA-P01, was declared inoperable to support planned surveillance testing in accordance with procedure 73ST-9AF04, AFA-P01 Full Flow In-service Test. This surveillance test is used to verify the operability of AF Train A, including the steam driven AF pump steam supply valve SGA-UV-138. At 11:33 on November 02, 2012, during the test, a steam leak was identified on the bonnet of valve SGA-UV-138 when the valve was opened. Operations personnel closed the valve to stop the steam leak, declared valve SGA-UV-138 inoperable and stopped the testing activity.

To establish conditions to repair the valve, a plant cooldown was conducted and TS LCO 3.7.5 Condition A was exited at 01:33 on November 3, 2012, when Unit 2 entered Mode 4 where the steam driven AF pump was no longer required to be OPERABLE. The cooldown activity was continued to place Unit 2 in Mode 5 where plant conditions would allow the leaking valve to be repaired. Maintenance and Engineering personnel identified that an improperly seated segmented bonnet seal ring had caused the steam leak at the valve bonnet. The valve was repaired on November 3, 2012, and was successfully retested on November 4, 2012, after Unit 2 was returned to Mode 3.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

This condition did not adversely affect plant safety or the health and safety of the public. The condition did not result in any challenges to the fission product barriers or result in any releases of radioactive materials.

The leak on the bonnet of valve SGA-UV-138 would have resulted in steam leakage to the Main Steam Support Structure room when the steam driven AF pump steam supply valve (SGA-UV-138) was opened such that the pump would not have been able to provide the required feedwater flow under all plant conditions. However, there was no actual safety consequence because the decay heat load is very low following core refueling and the two motor driven AF pumps were operable at all times during the event.

The containment isolation function of valve SGA-UV-138 could still be met because the flow path from containment is isolated from the leaking bonnet area when the valve is in the closed position.

This event did not prevent the fulfillment of a safety function and did not result in a safety system functional failure as described by 10 CFR 50.73(a)(2)(v).

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6. CAUSE OF THE EVENT:

The cause of this event was determined to be inadequate work instructions. The work instructions did not provide detailed guidance for installing an angled bonnet. The steam driven AF pump steam supply valves are installed with the bonnet and valve actuator assembly at a 45 degree angle from vertical to allow for access to the valve actuator. Valve maintenance activities are complicated by this configuration because the segmented bonnet seal rings are subject to displacement by gravity during work to assemble the valve. The bonnet seal rings must be correctly placed to ensure adequate sealing of the body to bonnet joint. The work instruction also lacked guidance to verify correct valve reassembly in the cold condition prior to performing the post maintenance testing at normal operating temperature and pressure.

7. CORRECTIVE ACTIONS:

As an immediate corrective action, Operations personnel closed the valve to stop the leak and declared valve SGA-UV-138 inoperable. Unit 2 was cooled down and placed in Mode 5 where the AF system is not required and the valve was repaired.

To prevent recurrence, corrective actions will revise work instructions to provide detailed guidance for valve re-assembly on valves that are configured with an angled bonnet. Work instructions will also incorporate guidance for as-found and as-left dimensional checks of the valve body to bonnet joint as a method to verify proper valve re-assembly.

Any additional corrective actions taken as a result of this event will be implemented in accordance with the PVNGS corrective action program. If information is subsequently developed that would significantly affect a reader's understanding or perception of this event, a supplement to this LER will be submitted.

8. PREVIOUS SIMILAR EVENTS:

In the past three years, PVNGS has not reported a similar event where a unit entered Mode 3 with an inoperable auxiliary feedwater train.