10CFR 50.73

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102-07130-MLL/JYL/FJO
October 09, 2015

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 2015-004-00

Enclosed please find Licensee Event Report (LER) 50-530/2015-004-00 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER reports a condition prohibited by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.4, resulting from entry into an operating mode of applicability (Mode 4) while the associated actions required to permit continued operation under LCO 3.7.2 were not met. This LER also reports a condition prohibited by TS LCO 3.7.2 resulting from an inoperable Main Steam Isolation Valve. A final disposition will be provided in a supplement to this LER which will be submitted upon completion of the event investigation.

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.

Arizona Public Service Company makes no commitments in this letter. If you have questions regarding this submittal, please contact Mark McGhee, Nuclear Regulatory Affairs Department Leader, at (623) 393-4972.

Sincerely,

Andrews, George W(Z99748)

Digitally signed by Andrews, George W(Z99748)
DN: cn=Andrews, George W(Z99748)
Reason: I am approving this document for Maria Lacal
Date: 2015.10.09 11:32:47 -07'00'

MLL/JYL/FJO/akf

Enclosure

cc: M. L. Dapas NRC Region IV Regional Administrator
M. M. Watford NRC NRR Project Manager for PVNGS
C. A. Peabody NRC Senior Resident Inspector for PVNGS

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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 and Information Collections Branch (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.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

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4. TITLE

Condition Prohibited by Technical Specifications 3.0.4 and 3.7.2 Due to an Inoperable Main Steam Isolation Valve

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
05	01	2015	2015	- 004 -	00	10	09	2015	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100%	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Mark McGhee, Department Leader, Nuclear Regulatory Affairs	623-393-4972

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
	SB	TBG	P070	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☐ NO		12	15	2015

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

On August 13, 2015, at approximately 2106, the Unit 3 main steam isolation valve SGE-UV-181 (MSIV-181) B actuator train was declared inoperable and Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.2, Condition A, was entered due to a failed fitting on the air supply line. To correct the condition the failed fitting was replaced and an additional pipe support was installed on the air-line. Following retests, the MSIV-181 B actuator train was restored to operable status and LCO 3.7.2, Condition A, was exited on August 15, 2015, at approximately 1830.

A similar air-line fitting failure had occurred on the Unit 3 MSIV-181 B actuator train on May 19, 2015. The investigation of this condition following the second failure determined the MSIV-181 B actuator train air-line configuration was modified in the spring 2015 Unit 3 refueling outage and was inoperable from the time Unit 3 entered Mode 4 on May 1, 2015, at 0258, following the outage because the air-line tubing was not adequately supported following the design change.

The investigation of the two fitting failures is still in progress. The cause of this condition and any additional corrective actions will be reported in a supplement to this Licensee Event Report.

No similar conditions have been reported by PVNGS in the last three years.

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

1. REPORTING REQUIREMENT(S):

This Licensee Event Report (LER) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report a condition prohibited by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.4 due to entry into a mode of applicability (Mode 4) with an LCO not met and the conditional requirements of LCO 3.0.4 not met. This LER also reports a condition prohibited by TS LCO 3.7.2, Main Steam Isolation Valves (MSIVs), resulting from an inoperable MSIV actuator train for a period of time longer than allowed by the LCO.

On May 19, 2015, at 0423, the Unit 3 MSIV SGE-UV-181 (MSIV-181) B actuator train was declared inoperable due to an air leak on the air-line for the actuator controls. The air leak was corrected and the actuator train was restored to operable status on May 19, 2015, at 1540.

On August 13, 2015, at 2106, the Unit 3 MSIV-181 B actuator train was again declared inoperable due to a similar air leak on the air-line for the actuator controls. The air leak was corrected, an additional piping support was installed, and the actuator train was restored to operable status on August 15, 2015, at 1830. The May 19, 2015, event was initially determined to not be reportable because the actuator train was restored within the LCO 3.7.2 time limitations and no firm evidence was identified at that time to indicate the actuator train was inoperable prior to the time of discovery of the air leak. A review subsequent to the second failure determined the MSIV-181 B actuator train was inoperable from the time Unit 3 entered Mode 4 during plant startup following the Unit 3 spring refueling outage (3R18) on May 1, 2015, at 0258.

Per LCO 3.7.2, Condition A, an inoperable MSIV actuator train must be restored to operable status within 7 days. If not, LCO 3.7.2, Condition E, requires the MSIV to immediately be declared inoperable and, if in Mode 1, Condition F requires the inoperable MSIV be restored to operable status within 4 hours. If Condition F is not met, Condition G requires the Unit to be placed in Mode 2 within 6 hours. Because the inoperable condition of the MSIV-181 B actuator train was not identified during the May 2015 plant startup activities, the requirements of LCO 3.0.4 and LCO 3.7.2 were not met.

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

The main steam system (EIIS Code: SB) contains two 28-inch main steam lines for each of the two steam generators. One MSIV (EIIS Code: SB) is installed in each main steam line outside of, but close to, containment in the main steam support structure building. The four MSIVs are downstream of the main steam safety valves (EIIS Code: SB), atmospheric dump valves (EIIS Code: SB), and auxiliary feedwater (EIIS Code: BA) pump turbine steam supply valves to prevent those components from being isolated from the steam generators by MSIV closure. Closure of MSIVs isolates each steam generator from the other and isolates the steam generators from the downstream secondary

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steam loads and piping such as the main turbine, steam bypass valves, and auxiliary steam supplies. The MSIV isolation function ensures termination of steam flow from the unaffected steam generator following a high energy line break event and supports mitigation of a steam generator tube rupture event.

Each MSIV is a 28-inch, double-disc, wedge type gate valve manufactured by the Anchor/Darling Valve Company. The actuation system on each MSIV is composed of two redundant safety related pneumatic-hydraulic actuator trains, A and B. The instrumentation and controls for the two actuator trains on each MSIV are physically and electrically separate and redundant. Either actuator train can independently perform the safety function to fast close the MSIV on demand which occurs upon receipt of a main steam isolation signal (MSIS) (EIIS Code: JE) from the engineered safety features actuation system. The MSIS is generated by high containment pressure, low steam generator pressure, or high steam generator water level. The MSIVs fail in the closed position on loss of control power, and may also be actuated manually.

For each actuator train, a volume of hydraulic fluid is stored at high pressure in a hydraulic accumulator. The hydraulic accumulator contains a pressurized nitrogen gas pre-charge which is separated from the stored hydraulic fluid by an internal piston to provide the energy required for fast closure of the MSIV upon receipt of a MSIS. The accumulators are filled to the desired hydraulic fluid level and pressure (5000 to 5400 pounds per square inch gauge (psig)) using an air-driven hydraulic pump.

The common hydraulic pump provides pressurized hydraulic fluid to both actuator trains on an MSIV and is a pneumatically operated positive displacement pump powered by the instrument air (EIIS Code: LD) system. The pump takes suction on a common hydraulic fluid reservoir and discharges to the hydraulic systems for each actuator train to charge the accumulators with hydraulic fluid. The hydraulic pump is also used to provide motive power during normal operations for slow opening and slow closing of the MSIV.

The actuation of the MSIV is controlled by the position of two four-way control valves that operate together to direct hydraulic fluid as needed to change valve position. One four-way valve controls the flow of hydraulic fluid from the pressurized accumulator to the MSIV actuator or the fluid reservoir while the other four-way valve controls the flow of hydraulic fluid to either side of the MSIV actuator hydraulic piston (bottom for opening, top for closing). Instrument air provides pilot air via a manifold block to the four-way control valves that open and close the MSIV. An air reservoir is provided on each actuator train as a backup control air supply for positioning the hydraulic fluid control valves. The air reservoirs ensure the MSIV can be closed following loss of instrument air system supply pressure. The MSIV air system components are interconnected by 3/8-inch stainless steel tubing using fittings.

TS LCO 3.7.2 requires that all four MSIVs and their associated actuator trains shall be operable when the unit is in Modes 1, 2, 3, and 4 except when all MSIVs are closed and deactivated. According to Condition A, a single inoperable actuator train must be restored to operable status within 7 days. If this cannot be accomplished, Condition E requires that the MSIV be immediately declared inoperable and Condition F is entered. If the MSIV cannot be restored to operable status in 4 hours according to Condition F, the unit must be placed in Mode 2 within 6 hours per Condition G.

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3. INITIAL PLANT CONDITIONS:

On August 13, 2015, PVNGS Unit 3 was in Mode 1 (Power Operation), at 100 percent power, normal operating temperature, and normal operating pressure. There were no other structures, systems, or components out of service that contributed to these events.

4. EVENT DESCRIPTION:

In April 2015, during the 3R18 refueling outage, a design change was implemented on the Unit 3 MSIV-181 B actuator train. The design change modified the MSIV-181 B actuator train air supply line configuration by installing a new type of swivel fitting in the line. The modification facilitates MSIV actuator assembly by replacing rigid fittings in the air supply lines with swivel fittings.

During the plant startup activities following the 3R18 refueling outage, the following mode changes were made in Unit 3:

- Entered Mode 4 at 0258 on May 1, 2015
- Entered Mode 3 at 1506 on May 1, 2015
- Entered Mode 2 at 0141 on May 3, 2015
- Entered Mode 1 at 1400 on May 3, 2015

On May 19, 2015, at 0423, the Unit 3 control room received alarms when the hydraulic accumulator pressure for MSIV-181 B actuator train unexpectedly dropped below 5000 psig. Operations personnel declared the B actuator train inoperable and entered LCO 3.7.2, Condition A. Local inspection revealed an air leak on the control air-line for the B actuator train due to a cracked fitting which had sheared so the air-line was completely disconnected. The MSIV-181 A actuator train was not affected by the air leak and remained capable of performing the safety function to close the MSIV if demanded. The failed fitting was replaced, retests were satisfactorily completed, and the B actuator train was restored to operable status on May 19, 2015, at 1540.

On August 13, 2015, at 2106, a similar air-line leak occurred on the Unit 3 MSIV-181 B actuator train and operations personnel declared the B actuator train inoperable and entered LCO 3.7.2, Condition A. In this case, an operator identified an air leak on the same fitting which had been replaced following the May 19, 2015, air leak event. The fitting was cracked but not sheared as before and when the operator isolated the leak by closing an upstream air isolation valve, the air pressure bled down causing the MSIV-181 B hydraulic accumulator to depressurize. The MSIV-181 A actuator train was not affected by this air leak and remained capable of performing the safety function to close the MSIV if demanded.

The investigation of this second failure determined the failed fitting was the new swivel fitting that had been installed during the 3R18 refueling outage. The investigation also identified elevated vibration levels on the air-line tubing for the MSIV-181 B actuator train which likely contributed to the failure of the fitting. The failed fitting was replaced and the design was modified to install an additional pipe support on the air-line tubing to restrict line movement and resultant fatigue of the line components. Retests were satisfactorily completed and the MSIV-181 B actuator train was restored to operable status on August 15, 2015, at 1830.

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A causal evaluation for the May 19, 2015, fitting failure was in progress when the August 13, 2015, failure occurred. The scope of this causal evaluation was expanded to evaluate both failures. To assess the extent of condition, the other MSIV and feedwater isolation valve (FWIV) actuator train air-lines were inspected in all three units for elevated vibrations and no other MSIV or FWIV was found to have elevated vibrations on the air-lines.

The May 19 event was initially determined to not be reportable because the actuator train was restored within the LCO 3.7.2 time limitations and no firm evidence was identified at that time to indicate the actuator train was inoperable prior to the time of discovery of the air leak. A review subsequent to the second failure determined the MSIV-181 B actuator train was inoperable from the time Unit 3 entered Mode 4 during plant startup following the 3R18 refueling outage on May 1, 2015, at 0258.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

This event did not result in a potential transient more severe than those analyzed in the Updated Final Safety Analysis Report (UFSAR) or result in the release of radioactive materials to the environment. There were no actual safety consequences as a result of this event and the event did not adversely affect the health and safety of the public.

The nuclear safety risk significance associated with the potential unavailability of the MSIV-181 B actuator train prior to its failure and actual unavailability after its failure was minimal. The increase in core damage and large early release risk associated with continuous unavailability of one of two MSIV actuator trains is less than 1E-9/yr and 1E-10/yr, respectively. This is due to the redundancy in the MSIV actuator trains and the non-safety related isolation valves downstream of an MSIV which can realistically be credited in most events to provide the main steam line isolation function. Therefore, the event did not result in potential safety consequences beyond those analyzed in the UFSAR.

The event would not have prevented the fulfillment of a safety function; and, the condition did not result in a safety system functional failure as defined by 10 CFR 50.73 (a)(2)(v).

6. CAUSE OF THE EVENT:

The event investigation is still in progress. The cause of this condition will be reported in a supplement to this LER.

7. CORRECTIVE ACTIONS:

Immediate corrective actions on May 19 and August 13, 2015, replaced the failed fittings.

Following the second air leak in August, 2015, a corrective action was implemented to add additional support for the air-line tubing for the Unit 3 MSIV-181 B actuator train.

The event investigation is still in progress. Any additional corrective actions will be reported in a supplement to this LER.

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8. PREVIOUS SIMILAR EVENTS:

No similar conditions have been reported by PVNGS in the last three years.