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102-07922-MLL/SPD
May 29, 2019

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

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS) Unit 1**
Docket No. STN 50-528 / License No. NPF 41
Licensee Event Report 2019-001-00

Enclosed please find Licensee Event Report (LER) 50-528/2019-001-00 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER reports an unanalyzed condition due to Emergency Core Cooling System valve leakage exceeding analyzed values.

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 Matthew Kura, Department Leader, Nuclear Regulatory Affairs, at (623) 393-5379.

Sincerely,

Thomas N. Wolf... for
Maria L. Lacal

MLL/SPD

Enclosure

cc: S. A. Morris NRC Region IV Regional Administrator
S. P. Lingam NRC NRR Project Manager for PVNGS
C. A. Peabody NRC Senior Resident Inspector PVNGS



LICENSEE EVENT REPORT (LER)

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-m/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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 1	2. Docket Number 05000528	3. Page 1 OF 3
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4. Title
Emergency Core Cooling System Valve Leakage Resulting in an Unanalyzed Condition

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
03	31	2019	2019	- 001	- 00	05	29	2019	Facility Name	Docket Number
										05000
										05000

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)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
10. Power Level 100	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(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)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)						
	<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)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(iii)						
<input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)										

12. Licensee Contact for this LER

Licensee Contact Matthew Kura, Department Leader, Nuclear Regulatory Affairs	Telephone Number (Include Area Code) 623-393-5379
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES
X	BQ	V	D243	Y					

14. Supplemental Report Expected <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No	15. Expected Submission Date Month: Day: Year:
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Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On March 31, 2019, at approximately 20:06 Mountain Standard Time (MST), PVNGS Unit 1 Shift Manager was informed that leakage at static system pressure from the "A" Train Emergency Core Cooling System (ECCS) was measured at approximately 100 milliliters per minute through a High Pressure Safety Injection (HPSI) system drain valve. This value exceeded the Large Break Loss of Coolant Accident (LOCA) analysis value of 3000 milliliters per hour (mL/hour), pressurized ECCS leakage from sources outside of containment.

At 02:30 MST on April 01, 2019, the valve was flushed and the leakage was reduced below the analysis value to 600 mL/hour with the system at static pressure. Troubleshooting efforts continued and the HPSI system drain valve was replaced on April 18, 2018. A pressurized ECCS leak test that was completed on April 23, 2019, confirming zero leakage from the valve.

The apparent cause was the connection of ECCS drain valves located outside of containment to an open-ended drain header that does not limit the potential radiological consequences of seat leakage. A design change is planned to install pipe caps on HPSI system drain valves.

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



**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Palo Verde Nuclear Generating Station (PVNGS) Unit 1	05000-528	2019	- 001	- 00

NARRATIVE

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)(ii)(B) to report an unanalyzed condition due to Emergency Core Cooling System (ECCS) piping leakage exceeding Large Break Loss of Coolant Accident (LOCA) analysis value of 3000 milliliters per hour (mL/hour) ECCS leakage from sources outside of containment.

This event was reported to the NRC pursuant to 10 CFR 50.72 (b)(3)(ii)(B) on April 01, 2019, via the emergency notification system (EN 53968).

2. DESCRIPTION OF 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 is protected following certain analyzed accidents such as a LOCA.

The ECCS response to a LOCA consists of an injection phase and a recirculation phase. In the injection phase, the High Pressure Safety Injection (HPSI) (EIS Code: BQ) system takes suction on the Refueling Water Tank (RWT) (EIS Code: BQ) and all injection is added to the four cold legs of the Reactor Coolant System (RCS) (EIS Code: AB). When the RWT has been depleted, the ECCS suction is automatically transferred to the containment sump and the ECCS recirculation phase is entered. Two redundant, 100 percent capacity trains of Safety Injection (SI) (EIS Code: BP) are provided that consist of the HPSI and Low Pressure Safety Injection (LPSI) (EIS Code: BP) subsystems.

The auxiliary building west mechanical piping penetration room has a common drain header that discharges to a floor drain. The common drain header receives drainage from HPSI system drain valves, a sampling system, and seven Chemical and Volume Control system drain valves. HPSI system drain valve SIA-V811 provides a drainage path from Train "A" of the system discharge to the RCS cold legs.

One of the purposes of the Large Break LOCA analysis is to evaluate and calculate the radiological consequences of a hypothetical design basis LOCA. The analysis evaluates dose contributions from the following release paths:

- Unfiltered discharge of containment air through the containment power access purge system
- Leakage of the containment air through the containment structure
- Leakage of the containment air via the depressurized secondary system
- Leakage from engineered safety feature (ESF) components outside of containment during recirculation phase
- Leakage of recirculating sump water to RWT during long term cooling

The analysis, as described in Chapter 15.6.5.6 of the PVNGS Updated Final Safety Analysis Report (UFSAR), assumes a maximum 3000 mL/hour leakage from ESF components outside of containment during the recirculation phase. Technical Specification 5.5.2, *Primary Coolant Sources Outside Containment*, prescribes a program that provides controls to minimize leakage for those portions of systems outside of containment.

3. INITIAL PLANT CONDITIONS:

On March 31, 2019, PVNGS Unit 1 was in Mode 1 (Power Operation) at 100 percent power with the RCS at normal operating temperature and normal operating pressure. There were no other structures, systems, or components out of service that contributed to this event.



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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
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Palo Verde Nuclear Generating Station (PVNGS) Unit 1	05000-528	2019	- 001	- 00

4. EVENT DESCRIPTION:

On January 30, 2019, leakage from the Unit 1 common drain header was first identified during an engineering walkdown of the SI system. On January 31, 2019, initial troubleshooting efforts concluded a drain valve for the Boric Acid Makeup Pump recirculation header was leaking into the common drain header. At the request of the Operations department, an additional troubleshooting game plan was developed to identify whether any of the SI system drain valves were leaking into the common drain header.

On March 31, 2019, the troubleshooting game plan resumed and the "A" Train HPSI system leakage was measured at 100 milliliters per minute (mL/min) at static pressure. When the line was pressurized with the "A" Train HPSI pump on minimum flow recirculation, the leakage increased to 1800 mL/min. The excessive leakage was determined to be seat leakage from SIA-V811. The Unit 1 Shift Manager was informed at 20:06 that these values exceeded the Large Break LOCA analysis value of 3000 mL/hour, pressurized ECCS leakage from sources outside containment.

The event was reported to the NRC pursuant to 10 CFR 50.72 (b)(3)(ii)(B), on April 01, 2019, at 03:40, via the emergency notification system (EN 53968).

At 02:30 on April 01, 2019, SIA-V811 was flushed and the flow rate from the common drain header was reduced to 600 mL/hour with the system at static pressure. On April 06, 2019, Unit 1 entered Mode 3 (Hot Standby) and later Mode 5 (Cold Shutdown) for the 1R21 refueling outage. On April 12, 2019, while performing the ECCS system leak test, the "A" Train HPSI pump was started and leakage from the common drain header was measured at 350 mL/min, exceeding the Large Break LOCA analysis; however, Unit 1 was outside the Mode of applicability.

On April 18, 2019, SIA-V811 was replaced. A pressurized ECCS leak test was performed on April 23, 2019 with zero measured leakage.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

This event did not result in a transient more severe than those analyzed in chapters 6 and 15 of the 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 it did not adversely affect the health and safety of the public. An estimate of the radiological input of the measured ECCS leakage was calculated using recent test data for other inputs to the LOCA dose calculation such as actual containment leakage and measured filtration efficiency. The estimated dose would have remained less than the dose criteria of 10 CFR Part 100, *Reactor Site Criteria*.

The condition would not have prevented the fulfillment of any safety function of structures or systems as defined by 10 CFR 50.73 (a)(2)(v).

6. CAUSE OF THE EVENT:

The apparent cause was the connection of ECCS drain valves located outside of containment to an open-ended drain header that does not limit the potential radiological consequences of seat leakage.

7. CORRECTIVE ACTIONS:

A design change is planned to install pipe caps on HPSI system drain valves in all three Units.

8. PREVIOUS SIMILAR EVENTS:

No previous similar events have been reported by PVNGS.