10 CFR 50.73

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102-08851-TAH/JJM
August 21, 2024

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

Subject: **Palo Verde Nuclear Generating Station (PVNGS) Unit 3**
Docket No. STN 50-530/Renewed License No. NPF-74
Licensee Event Report 2024-001-01

Enclosed, please find the Licensee Event Report (LER) 50-530/2024-001-01 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER supplement provides additional information that was identified through PVNGS evaluation of the Unit 3 loss of power to both channels of the Boron Dilution Alarm Monitoring System with subsequent Technical Specification Violation of 3.3.12 that occurred on April 9, 2024.

The initial LER 2024-001-00 for the Technical Specification violation was provided to the Nuclear Regulatory Commission (NRC) on June 5, 2024. In this LER, the cover letter and enclosure cover page referenced an incorrect unit. Only Unit 3 was affected. This issue has been documented in the corrective action program.

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.

No new commitments are being made to the NRC by this letter. Should you need further information regarding this submittal, please contact Matthew S. Cox, Department Leader, Nuclear Regulatory Affairs, at (623) 393-5753.

Sincerely,

Horton, Todd (Z10098)

Digitally signed by Horton, Todd (Z10098)
Date: 2024.08.21 12:45:31 -07'00'

TAH/JJM/cr

Enclosure: Unit 3 Licensee Event Report 2024-001-01

cc: J. Monninger NRC Region IV Regional Administrator
W. T. Orders NRC NRR Project Manager for PVNGS
N. Cuevas NRC Acting Senior Resident Inspector for PVNGS

ENCLOSURE

Unit 3 Licensee Event Report
2024-001-01

NRC FORM 366 (04-02-2024) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 | EXPIRES: 04/30/2027

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-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name		2. Docket Number	3. Page
Palo Verde Nuclear Generating Station (PVNGS) Unit 3	■ 050 ☐ 052	00530	1 OF 3

4. Title

Inoperable Boron Dilution Alarm System(BDAS) with Technical Specification Violation

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	☐ 050	Docket Number
04	13	2024	2024	- 001 -	01	08	21	2024	Facility Name	☐ 052	Docket Number

9. Operating Mode	10. Power Level
5	0

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☑ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

☐ **OTHER** (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Matthew S. Cox, Department Leader Nuclear Regulatory Affairs	(623) 393-5753

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☑ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

On 4/9/2024 at 1100, while in a refueling outage at zero percent power, Unit 3 control room experienced an unplanned partial loss of power to annunciator windows in the Control Room due to a planned down power of an electrical power supply for the performance of maintenance. The control room entered Technical Specification (TS) Limited Condition for Operation (LCO) 3.3.12 Boron Dilution Alarm System (BDAS) Condition A and B. Personnel from the Chemistry Department obtained samples until power was restored and the BDAS returned to OPERABLE 4/9/2024 at 1233 when the TS LCO was exited.

On 4/13/2024 at approximately 0630, it was discovered that the sample was obtained from an incorrect sample location. Further TS LCO 3.3.12 Condition B was not met as redundant samples were not taken. The NRC resident inspectors were notified of this event.

No similar event has occurred at PVNGS in the last 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/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 04/30/2027

1. FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
			YEAR	SEQUENTIAL NUMBER	REV NO.
Palo Verde Nuclear Generating Station (PVNGS) Unit 3	■ 050 ☐ 052	00530	2024	- 001	- 01

NARRATIVE

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

1. REPORTING REQUIREMENT(S):
This Licensee Event Report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B): Any operation or condition which was prohibited by the plant's Technical Specification. TS LCO 3.3.12 Conditions A and B were entered on 4/9/2024 and required actions were not met.

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

Non-Class 125 VDC (EIIS:EE) and Non-Class 1E instrument 120 VAC (EIIS:EE) provides primary and alternate power, respectively, to the control room Annunciators on boards 2, 3, 4, 6, and 7(EIIS:IB). Board 4 contains an alarm point for the BDAS (EIIS:IG) monitoring alarm. BDAS provides two independent and redundant channels (Channels 1 and 2) to ensure detection and alarm of a boron dilution event while in hot standby, hot shutdown, cold shutdown, and refueling, Modes 3 through 6, respectively.

The BDAS is credited in the Updated Final Safety Analysis Report (UFSAR) Chapter 15 safety analysis with alerting operators to an inadvertent boron dilution 15 minutes prior to achieving criticality assuming the maximum dilution rate while in modes 3, 4, and 5, and within 30 minutes in Mode 6. This allows the operator time to diagnose and terminate the boron dilution prior to criticality.

The BDAS receives and monitors two neutron flux signals (one per BDAS channel) from the startup channel nuclear instrumentation. When these neutron flux signals increase during shutdown to equal to or greater than the calculated alarm set-point, alarm signals are generated. The BDAS provides two separate and independent alarm signals (one signal per BDAS channel) to the plant annunciation system upon determination of a boron dilution event. Each alarm signal will cause the annunciator window "Possible Inadvertent Boron Dilution" to alarm, which then relays an alarm to the control room via the Annunciator on Board 4.

3. INITIAL PLANT CONDITIONS:

On 4/9/2024, Palo Verde Unit 3 was in Mode 5 Cold Shutdown at 0 percent power. Unit 3 was in Refueling Outage 3R24. Reactor Coolant System (RCS) was intact with RCS temperature at 98.2 degrees Fahrenheit and RCS pressure at 78 pounds per square inch absolute (PSIA).

4. EVENT DESCRIPTION:

On 4/9/2024 Unit 3 was in a Refueling Outage and planned maintenance was being performed on the alternate power supply. Since the normal power supply was inoperable, the control room experienced an unanticipated loss of power to the annunciators on boards 2, 3, 4, 6, and 7 at 1100. Operations then declared both channels of BDAS inoperable due to the loss of annunciation and entered TS LCO 3.3.12 Conditions A and B. The Operations Department contacted the Chemistry Department to get the required boron samples to meet TS LCO requirements. This required collection of two independent RCS boron samples. At 1233, power was restored and the TS LCO conditions were exited.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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NARRATIVE

On 4/13/2024, the Chemistry Supervisor was reviewing the samples and realized that the samples were obtained from a different sample point than specified in plant procedures for the conditions of the RCS system being in Shutdown Cooling (SDC) at the time of the event. Furthermore, the Chemistry Supervisor noticed the samples were not obtained redundantly to validate boron concentration as required by TS LCO 3.3.12 Condition B. The supervisor contacted the control room of the findings.

Units 1 and 2 were unaffected by the event and both remained in MODE 1 at 100% power.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

Operability of the BDAS channels are necessary to meet the assumptions of the safety analyses to mitigate the consequences of an inadvertent boron dilution event as described in the UFSAR Chapter 15, Revision 22. Unit 3 was in MODE 5 on 4/9/2024 when both channels of the BDAS became inoperable. During the time of the event, there were no MODE changes and no inadvertent boron dilutions.

6. CAUSE OF THE EVENT:

The direct cause of the event was lack of formality and adequate details in the verbal communications between the Operations and Chemistry departments. The Operations Department and Chemistry Department communications for the LCO required boron samples did not specify all requirements. The apparent cause is that the Chemistry Department procedure did not contain specific sampling requirements necessary to satisfy the required actions of LCO 3.3.12 Condition B.

7. CORRECTIVE ACTIONS:

Immediate actions included the restoration of power supplies to the annunciator panels which subsequently restored BDAS to OPERABLE status.

Actions included briefing Operations Staff and Chemistry Staff including expected behaviors regarding control room communication to outside groups and the importance of thoroughly communicating LCO details. Additional actions include procedure revisions for the Chemistry Department to add guidance on sampling locations and other critical task information related to the LCO requirements. The Operations Department will revise the Loss of Annunciators procedure to add steps directing Chemistry to use the guidance.

8. PREVIOUS SIMILAR EVENTS:

No similar events have occurred in the prior three years.