



A subsidiary of Pinnacle West Capital Corporation

10CFR50.73

Palo Verde Nuclear
Generating Station

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102-05579-CE/SAB/DLK
September 29, 2006

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 2003-003-01**

Attached please find supplemental Licensee Event Report (LER) 50-529/2003-003-01 that has been prepared and submitted pursuant to 10CFR50.73. The original LER reported a condition where a Source Range Monitor was inoperable at the start of core reload following a refueling outage involving complete core offload. This supplement contains updated information related to the cause of the event and corrective actions.

In accordance with 10CFR50.4, a copy of this LER is being forwarded to the NRC Region IV Office and the Resident Inspector. If you have questions regarding this submittal, please contact James A. Proctor, Section Leader, Regulatory Affairs, at (623) 393-5730.

Arizona Public Service Company makes no commitments in this letter.

Sincerely,

CE/SAB/DLK

Attachment

cc: B. S. Mallett
G. G. Warnick
M. B. Fields

Region IV Administrator
Senior Resident Inspector
PVNGS Project Manager

A member of the STARS (Strategic Teaming and Resource Sharing) Alliance

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Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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 reverse for required number of digits/characters for each block)

1. FACILITY NAME Palo Verde Nuclear Generating Station Unit 2	2. DOCKET NUMBER 05000529	3. PAGE 1 OF 5
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4. TITLE
SOURCE RANGE MONITOR INOPERABLE DURING CORE RELOAD

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	23	2003	2003	003	01	09	29	2006		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE 6	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10. POWER LEVEL 0	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)						
	20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)						
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)						
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER - Specify in Abstract below or in NRC Form 366A						
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)							
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20.2203(a)(2)(v)	xx 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)							
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)							
	20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)							

12. LICENSEE CONTACT FOR THIS LER

NAME James A. Proctor, Section Leader, Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 623-393-5730
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO		MONTH	DAY	YEAR

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

All times are approximate and Mountain Standard Time.

On November 23, 2003, Unit 2 was defueled preparing to enter Mode 6, when a Source Range Monitor (SRM) was found pegged low and reading "INVALID" on the Plant Monitoring System, and Emergency Response Facility Data Acquisition Display System. Technicians evaluated the channel and found all parameters within the nuclear instrument drawer to be normal. Based on the limited troubleshooting, the length of time since fuel had been off loaded and the absence of any neutron flux, the requirements of the Surveillance Test were considered satisfactory. With both SRM Channels declared as OPERABLE, the Irradiated Fuel Movement Checklist was completed.

Unit 2 commenced core alterations to refuel the Unit 2 reactor and entered Mode 6 at 16:02. The first fuel assembly was lowered next to SRM Channel 1 with counts per second increasing as expected. However, as the second assembly was lowered next to SRM Channel 2, the counts per second did not change. At 16:25 SRM Channel 2 was declared inoperable and core alteration was suspended.

No similar LER condition has been submitted to the NRC in the past three years.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

1. REPORTING REQUIREMENT(S):

Pursuant to 10 CFR 50.73(a)(2)(i)(B), this LER reports an event where two fuel assemblies were moved into the core with one Source Range Monitor (SRM) channel inoperable – a condition prohibited by Technical Specifications. (EIIC Code: IG).

Technical Specification 3.9.2 requires two startup monitors (SRMs) to be OPERABLE in Mode 6 (Refueling). With one required SRM inoperable, the required actions are to immediately suspend core alterations and immediately suspend positive reactivity additions. Contrary to the requirements of TS 3.9.2, core alteration commenced with one channel of SRM inoperable.

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

The Excore Neutron Flux Monitoring System (EIS Code: IG) includes neutron detectors located around the reactor core and signal conditioning located in the control room area. Neutron flux is monitored from source levels through full power operation, and signal outputs are provided for reactor control, reactor protection and information display.

Two source range monitors, also known as "startup channels" provide source level neutron flux information (in the range of counts to a power range of less than 1E-5 percent power) to the reactor operator for use during extended shutdown periods, initial reactor startup and startups after extended periods of reactor shutdown. Each channel consists of a dual section proportional counter assembly with each section having multiple BF₃ proportional counters, one pre-amplifier (located outside the biological shield), and a signal processing drawer (located in the Control Room) containing power supplies, a logarithmic amplifier, and test circuitry.

High voltage power to the proportional counters is manually switched off when the SU AND CONT CH TRBL annunciator is activated in the main control room (above approximately 2000 counts per second), to extend detector life. These channels provide readout and audio count rate information, but do not provide direct control or protective functions.

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3. INITIAL PLANT CONDITIONS:

All times are approximate and Mountain Standard Time.

On November 23, 2003 at 16:25, Palo Verde Unit 2 was in Mode 6 commencing core alteration to reload the Unit 2 reactor.

There were no other major structures, systems, or components that were inoperable at the start of the event that contributed to the event. There were no failures that rendered a train of a safety system inoperable and no failures of components with multiple functions were involved.

4. EVENT DESCRIPTION:

On November 23, 2003 at 14:12 Unit 2 was defueled preparing to enter Mode 6. While performing a Mode 6 Shiftly Surveillance Test (ST), SRM Channel 2 was found pegged low and reading "INVALID" on the Plant Monitoring System (PMS) and the Emergency Response Facility Data Acquisition Display System (ERFDADS). Since the channel was off scale low, no audible signal was detected. Technicians evaluated the channel and found all parameters within the excore nuclear instrumentation drawer normal. Additionally, when a test signal was provided as an input to SRM Channel 2, audible counts were heard in the Control Room and Containment and ERFDADS came on scale and indicated properly. Engineering was contacted and indicated that the "zero counts" condition was considered a normal response due to the length of time that fuel had been off loaded and the absence of any neutron flux. Based on the troubleshooting and the length of time the core was defueled, the requirements of the ST were considered satisfactory and both SRM Channels were declared OPERABLE.

At 15:19 the Irradiated Fuel Movement Checklist was completed. Unit 2 commenced core alteration to refuel the Unit 2 reactor and at 16:02 entered Mode 6.

The first fuel assembly was lowered next to SRM Channel 1 with counts per second increasing as expected. However, as the second assembly was lowered next to SRM Channel 2, the counts per second did not change. At 16:25 SRM Channel 2 was

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declared inoperable and core alteration was suspended.

There were no other major structures, systems, or components that were inoperable at the start of the event that contributed to the event. There were no actual loss of safety function that rendered a train of a safety system inoperable, and no failures of components with multiple functions were involved. The event did not result in the release of radioactivity to the environment and did not adversely affect the safe operation of the plant or health and safety of the public.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

The excore nuclear instrument channels provide readout and audio count rate information, but do not provide direct control or protective functions. Additionally, the boron sample taken prior to the event was at 4256 ppm. After the event, at 18:05, RCS boron concentration was 4263 ppm. The safety function to shut down the reactor and maintain it in a safe shutdown condition remained fulfilled.

There are no actual safety consequences as a result of this condition, the condition would not have prevented the fulfillment of the safety function, and the condition did not result in a safety system functional failure as defined by 10 CFR50.73(a)(2)(v).

6. CAUSE OF THE EVENT:

The direct cause associated with the inoperable SRM was a loose cable connector in the SRM Channel 2 input cable at the Auxiliary Building/Containment penetration.

The root cause associated with the violation of Technical Specification 3.9.2 was that personnel involved made an incorrect operability decision. The initial limited evaluation performed by maintenance personnel only confirmed the instrument drawer was working properly, but provided no confirmation that the pre-amp or the detector was also functioning properly. Also, engineering assumed that the "zero counts" condition was normal based on the length of time the core had been off-loaded and the results of

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a minor modification installed during the outage to reduce the induced electronic noise in the Excore Startup channels. The ST steps for the SRM Channel 2 were checked "satisfactory" based on the maintenance evaluation and engineering input.

No unusual characteristics of the work location (e.g., noise, heat, poor lighting) directly contributed to this event.

7. CORRECTIVE ACTIONS:

The following actions were taken to address the direct cause:

Technicians disconnected the cable from the penetration connection and visually inspected the connector. No damage was found. The connector was reconnected to the Auxiliary Building/Containment penetration. A channel check of the SRM Channel 2 was performed satisfactorily and SRM Channel 2 was declared OPERABLE.

The following actions were taken to address the root cause associated with the violation of Technical Specification 3.9.2:

The Mode 6 Shiftly ST was revised to provide specific guidance to ensure that Operations does not "pass" the ST and declare the SRMs OPERABLE if an SRM channel indicates "off-scale low," or if one channel differs from another by more than 2.5 times.

The new guidance associated with SRM channel operability was communicated to Control Room Operators during Licensed Operator Continuing Training through required reading.

8. PREVIOUS SIMILAR EVENTS:

In the past three years there have been no similar LERs submitted to the NRC where a Palo Verde Generating Unit had a failed SRM channel during core alterations.