



10CFR50.73

Palo Verde Nuclear
Generating Station

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192-01107-WEI/SAB/DJS
June 17, 2002

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
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 2002-002-00**

Attached please find voluntary Licensee Event Report (LER) 50-529/2002-002-00 that has been prepared and submitted pursuant to 10CFR50.73. This voluntary LER reports a condition where Unit 2 operated with post-test instead of pre-test values for the Core Protection Calculator for DNBR and LPD uncertainty multipliers during post-outage power ascension testing.

In accordance with 10CFR50.4, a copy of this LER is being forwarded to the NRC Regional Office, NRC Region IV and the Resident Inspector. If you have questions regarding this submittal, please contact Daniel G. Marks, Section Leader, Regulatory Affairs, at (623) 393-6492.

Arizona Public Service Company makes no commitments in this letter. The corrective actions described in this LER are not necessary to maintain compliance with regulations.

Sincerely,

WEI/SAB/DJS/kg

Attachment

cc: E. W. Merschoff
NRC Resident Inspector for PVNGS
J. N. Donohew
D. G. Naujock

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, NEOF-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
Post-test Constants Entered into Core Protection Calculator System

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
04	18	2002	2002	002	00	06	17	2002	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
10. POWER LEVEL 48	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)						
[Shaded Area]	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)	X OTHER Voluntary 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)	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 Daniel G. Marks, Section Leader, Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) 623-393-6492
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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			MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO							

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

On April 18, 2002 at 17:49 Mountain Standard Time, with Unit 2 in Mode 1, Reactor Engineering personnel detected that the unit was operated prior to test completion, with post-test instead of pre-test values for the Core Protection Calculator (CPC) DNBR and LPD uncertainty multipliers during post-outage power ascension testing.

The error was caused by engineering personnel applying data elements from an incorrect location in a table. Post-testing values were applied instead of pre-testing values.

Corrective action was taken immediately to correct the CPC constants. In addition, Units 1 and 3 were verified to have the correct constants installed.

A previous similar event was reported in LER 50-530/2002-001.

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

1. REPORTING REQUIREMENT(S):

This voluntary LER 529/2002-002-00 is being submitted to report a condition related to human performance that does not meet the reporting threshold of 10CFR50.73 (a) for submitting a LER, but may prove useful and be of generic interest to the nuclear industry.

Less conservative post-testing (versus pre-testing) addressable constant values had been inserted in all four Core Protection Calculators (CPCs) for the uncertainty multipliers for departure from nucleate boiling ratio (DNBR) and local power density (LPD).

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

There were no other structures, systems, or components that were inoperable that contributed to this condition. There were no failures that rendered a train of a safety system inoperable and no failures of components with multiple functions were involved.

The CPCs consist of four separate, redundant channels. Each channel of CPCs is a computer that continuously calculates thermal conditions and thermal limits. The CPC system is an integral part of the plant protection system (JC), in that it provides two trips to the reactor protection system (JC): DNBR and LPD. The CPCs initiate protective action to ensure specified acceptable fuel design limits (SAFDL) on DNBR and LPD are not exceeded during anticipated operational occurrences. The BERR3 addressable constant may be considered an attendant control that is required for the specified safety function (in this case, LPD – High). Similarly, the BERR1 addressable constant may be considered an attendant control that is required for the specified safety function (in this case, DNBR – Low). Although the post-test addressable constant values were not as conservative as the pre-testing values, the CPCs were at all times capable of performing their design function.

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

3. INITIAL PLANT CONDITIONS:

On April 18, 2002, at approximately 17:49 Mountain Standard Time (MST), Palo Verde Unit 2 was in Mode 1 (POWER OPERATION), at approximately 48 percent rated thermal power, conducting power ascension testing (PAT) following its tenth refueling outage. There were no major structures, systems, or components that were inoperable at the start of the event that contributed to the event.

4. EVENT DESCRIPTION:

On April 18, 2002, at approximately 17:49 Mountain Standard Time (MST), Palo Verde Unit 2 was in Mode 1, conducting power ascension testing following its tenth refueling outage. It was discovered that the less conservative post-testing (versus pre-testing) addressable constant values had been inserted in all four CPCs for the uncertainty multipliers for DNBR and LPD. At the time of discovery, the control room personnel did not have reasonable assurance that the four CPCs could perform their safety functions with the less conservative values inserted. At 17:59 MST, the control room declared all four channels of CPC INOPERABLE and entered TS LCO 3.0.3 Condition 1. At 18:31 MST with the correct addressable constant values installed and verified on 3 of 4 CPCs, the control room exited LCO 3.0.3 Condition 1. At 18:33 MST, with the correct addressable constant values installed and verified in the fourth CPC, the control room exited LCO 3.3.1 Condition A.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

Technical Specification Limiting Condition for Operation (LCO) 3.3.1, Reactor Protective System (RPS) Instrumentation - Operating, states, in part:

Four RPS trip and bypass removal channels for each Function in Table 3.3.1-1 shall be OPERABLE.

BERR1 (uncertainty multiplier for DNBR) impacts DNBR – Low and BERR3 (uncertainty multiplier for LPD) impacts LPD – High. Per TS Table 3.3.1-1, these trip functions are applicable in Modes 1 and 2.

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

The BERR1 and BERR3 values installed in the four Unit 2 CPCs for Unit 2 Cycle 11 (U2C11) did not agree with those specified in the U2C11 Master Setpoints Overall Uncertainty Analysis.

Cycle 11 Master Setpoints Overall Uncertainty Analysis contains two sets of values for BERR1 and BERR3. A more conservative "pre-test" value is specified to provide additional margin prior to validation of the uncertainties associated with the U2C11 reload. A less conservative "post-test" value is specified to recover the additional pre-test margin while still ensuring the CPCs are capable of performing their design function. Reload Power Ascension Test (PAT) performs testing during the initial power ascension following a refueling operation to verify core design parameters pursuant to Surveillance Requirements (SR) 3.2.2.1 and 3.3.1.11.

The function of the post-test values is to support the CPC design function of protecting the plant. Installation of the post-test values of BERR1 and BERR3 prior to validation of the uncertainties per PAT did not prevent the CPCs from performing their design function.

The specified safety function of the CPCs is to shut down the reactor and maintain it in a safe shutdown condition. The CPCs were always capable of performing their specified safety function during the Cycle 11 PAT.

The event did not result in any challenges to the fission product barriers or result in any release of radioactive materials. Therefore, there were no adverse safety consequences or implications as a result of this event. This event did not adversely affect the safe operation of the plant or health and safety of the public.

The condition would not have prevented the fulfillment of the safety function and did not result in a safety system functional failure as defined by 10CFR50.73(a)(2)(v).

6. CAUSE OF THE EVENT:

Unit 2 Cycle 11 Master Setpoints Overall Uncertainty Analysis Table 4.1 contains two sets of values for BERR1 and BERR3. A more conservative pre-test value is specified to provide additional margin prior to validation of the uncertainties associated with the U2C11 reload.

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

Reactor Engineering personnel selected and inserted the post-test values instead of the intended pre-test values. These less conservative values were independently verified, but the second party verification failed to identify the wrong set of values had been selected.

7. CORRECTIVE ACTIONS:

At the time of discovery that the post-test values were installed in all four CPC channels, Operations declared the CPCs INOPERABLE and suspended the power ascension testing at 48 percent power.

The correct pre-test values for BERR1 and BERR3 were installed and verified to be correct in all four CPC channels. Additionally, Reactor Engineering checked and independently verified other addressable CPC/COLSS (Core Operating Limit Supervisory System; EISS - ID) constants were correct in Unit 2. No errors were found. Operations declared the CPCs OPERABLE and recommenced power ascension.

The CPC/COLSS constant were also reviewed and verified to be correct in Units 1 and 3.

8. PREVIOUS SIMILAR EVENTS:

A previous similar event was reported in Unit 3, LER 50-530/2002-001. In this event, the Unit 3 Cycle 10 (U3C10) Master Setpoint Overall Uncertainty Analysis was revised when it was determined that a manual calculation to the U3C10 analysis for two COLSS constants used an incorrect adjustment.

The corrective actions of the manual calculation error reported in Unit 3, LER 50-530/2002-001 would not have prevented engineering personnel from selecting the data from the incorrect location in the uncertainty analysis table.

9. ADDITIONAL INFORMATION:

None.