10 CFR 50.73

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

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102-05743-DCM/DJS
September 07, 2007

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528, STN 50-529 and STN 50-530
License No. NPF 41, NPF 51 AND NPF 74
Licensee Event Report 2007-002-00

Attached please find Licensee Event Report (LER) 50-528/2007-002-00 prepared and submitted pursuant to 10 CFR 50.73. This LER reports an Operation or Condition prohibited by Technical Specifications (TS) (10 CFR 50.73 (a)(2)(i)(B)), since the Train B Class 1E pressurizer backup heater control circuit would not be properly isolated for a control room fire event, (10CFR50 Appendix R Section III.G.3/III.L)

In accordance with 10 CFR 50.73(d), copies of this LER are being forwarded to the NRC Regional Office, NRC Region IV and the PVNGS Senior Resident Inspector. If you have questions regarding this submittal, please contact Ray E. Buzard, Section Leader, Regulatory Affairs, at (623) 393-5317. Arizona Public Service Company makes no commitments in this letter.

Sincerely,

D. C. Mims

DM/DJS/gt

Attachment

cc: B. S. Mallett — NRC Region IV Regional Administrator
M. T. Markley — NRC NRR Project Manager
G. G. Warnick — NRC Senior Resident Inspector for PVNGS

IE22
NRR

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

Estimated burden per response to comply with this mandatory 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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Train B Class 1E pressurizer backup heater control circuit would not be properly isolated for a Control Room Fire Event

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
									PVNGS Unit 2	05000529
7	10	2007	2007	- 002 -	00	09	07	2007	PVNGS Unit 3	05000530

9. OPERATING MODE

3/1/1

10. POWER LEVEL

0/100/100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Ray E. Buzard, Section Leader, Regulatory Affairs	623-393-5317

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

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On July 5, 2007, during a 10 CFR 50 Appendix R review by Fire Protection Engineering, it was determined the control room circuit of the Train B class-1E pressurizer backup heaters would not be properly isolated for a control room fire event. During a control room fire event, procedures provide instruction to transfer all the Local/Remote (L/R) transfer switches to the local position. This action isolates the control room circuits associated with components required to shutdown the unit for a control room fire event. When the L/R switch associated with the Train B Class-1E pressurizer backup heaters is in the local position, a postulated line to ground fault on the conductor (wire 51 - positive line) in conjunction with a negative line to ground fault from the same battery system could cause a 10 amp fuse to fail open. This would prevent the breaker from closing from the remote shutdown panel resulting in the loss of Train B Class-1E pressurizer backup heater local control.

Palo Verde has revised the Control Room Fire procedure to add instructions to close the local manual breaker in the Train B switchgear room.

In the past three years, Palo Verde has not identified a similar Appendix R issue.

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Palo Verde Nuclear Generating Station Unit 1	05000528	2007	-- 002	-- 00	2 OF 6

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

NOTE: All times listed in this event report are approximate and Mountain Standard Time (MST) unless otherwise indicated.

1. REPORTING REQUIREMENT(S):

This LER (50-528/2007-002-00) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B), to report an Operation or Condition prohibited by Technical Specifications (TS). Specifically, on July 5, 2007, Palo Verde Nuclear Generating Station determined that the Train B Class 1E pressurizer backup heater control circuit would not be properly isolated for a Control Room Fire Event, (10 CFR 50 Appendix R Section III.G.3/III.L)

All Three Units entered TS LCO 3.3.11 on July 5, 2007, at 1725 hours.

LCO 3.3.11 The Remote Shutdown System Instrumentation Functions in Table 3.3.11-1 and each Remote Shutdown System disconnect switch and control circuit shall be OPERABLE.

LCO 3.3.11 Condition B requires that, if one or more remote shutdown system disconnect switches or control circuits are inoperable, to restore the required switch(s)/circuit(s) to OPERABLE status within 30 days. As this condition existed since original plant design, the LCO and required action were not met in the three Units.

On July 10, 2007 after review by site oversight organizations, it was determined that this event was reportable due to the fact that the condition has existed in all three Units from original design.

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

The pressurizer (Pzr) (EIIS: AB) provides a point in the Reactor Coolant System (RCS) (EIIS: AB) where liquid and vapor are maintained in equilibrium under saturated conditions for pressure control purposes to prevent bulk boiling in the remainder of the RCS. Key functions include maintaining required primary system pressure during steady state

operation and limiting the pressure changes caused by reactor coolant thermal expansion and contraction during normal load transients.

The Pzr pressure control elements addressed by Technical Specification (TS) 3.4.9 include the Pzr water level, the required heaters (EIIS: EHTR) and their backup heater controls, and emergency power supplies. Per TS LCO 3.4.9 Bases, the "class" heaters are required to be operable in modes 1-3 in order to ensure sub-cooled conditions in the reactor coolant system that are needed for proper core heat removal. Brief heater operation is credited in some UFSAR Chapter 15 accident and reload analyses. In addition, heater operation is required in safety related analysis in support of 10 CFR 50 Appendix A general design criteria (natural circulation cool down) and in 10 CFR 50 Appendix R (Fire Protection). The Pzr heaters are single unit, direct immersion heaters that protrude vertically into the Pzr through sleeves welded in the lower head of the pressurizer.

A number of the heaters are connected to proportional controllers, which adjust the heat input to account for steady-state losses and to maintain the desired steam pressure in the Pzr. The remaining heaters are connected to on-off controllers and are designated as "back-up" heaters. Two groups of back-up heaters are designated as the "class" heaters associated with TS 3.4.9. These back-up heaters are normally de-energized but are automatically turned on by a low Pzr pressure signal or a high level error signal.

3. INITIAL PLANT CONDITIONS:

On July 5, 2007 Palo Verde Unit 1 was in Mode 3 (Hot Standby), operating at zero percent power. Palo Verde Units 2 and 3 were in MODE 1 at 100 percent power level. No other major structures, systems, or components were inoperable at the start of the event that contributed to the event.

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

4. EVENT DESCRIPTION:

During a 10CFR50 Appendix R review for the purpose of updating Appendix R calculations on July 5, 2007, by Fire Protection Engineering, it was determined that the control room circuit of the Train B class-1E pressurizer backup heaters would not be properly isolated for a control room fire event. During a control room fire event, procedure 40AO-9ZZ19 (Control Room Fire) provides instruction to transfer the Local/Remote (L/R) transfer switches to local position. This action is taken for the purpose of isolating the control room circuits associated with components required to shutdown the unit for a control room fire event. As shown on drawing 01,02,03-E-RCB-0010, (which encompasses all three Units), when the L/R switch associated with the Train B Class-1E pressurizer backup heaters is in local position, relay "SX" will drop out (de-energized) and contact 15/16 of SX relay, connected in the breaker closing circuit, will close.

Downstream of SX contact 15/16 is the Safety Injection Actuation Signal (SIAS) signal contact which is located in the control room. The review identified that a postulated line to ground fault on the conductor (wire 51 - positive line) in conjunction with a negative line to ground fault from the same battery system in the control room due to a fire induced failure, could cause the 10 amp fuse in the breaker control circuit to fail open when switch contact 1/1C is closed. This would result in a loss of the ability to control the Train B Class-1E pressurizer backup heaters due to the inability to operate the breaker from the remote shutdown panel.

In addition to the ground fault event described above, a second failure mechanism might also interrupt control of the pressurizer backup heaters. A 'hot short' condition on the heater control circuit, on either side of the SIAS signal of the breaker closing circuit, would close the breaker. Opening the breaker will cause the breaker to go into an anti-pump mode, and then the breaker would need to be manually controlled.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

The event did not result in any challenges to the fission product barriers or result in the release of radioactive materials. Therefore, there were no adverse safety consequences

as a result of this event and the event did not adversely affect the safe operation of the plant or health and safety of the public.

The event did not result in a transient more severe than those analyzed in the updated Final Safety Evaluation Report Chapters 6 and 15. The event did not have any nuclear safety consequences or personnel safety impact.

The Appendix R events analyzed in TA-13-C00-2000-004 (Current Analysis of Record (AOR) for Fire Protection) are minimally impacted by the delay in the use of the 125 KW of Class Backup Heaters.

The results of the most limiting event, (Stuck open Atmospheric Dump Valve (ADVs)(EIIS: SB)) for fire inside the CR, met the acceptance criteria for 10CFR50 Appendix R fire scenario without the use of the heaters for a four hour duration. Sufficient Sub-Cooled Margin (SCM) would be maintained for this duration with a SCM of approximately 41 degrees F at the end of four hours.

A four hour duration would allow time for Operations personnel to determine the loss of remote breaker control and then manually close the breaker in the switchgear room adjacent to the remote shut down room.

6. CAUSE OF THE EVENT:

The root cause of failure investigation is not complete. The preliminary cause of the event was an original design failure to identify the potential scenarios described in this LER. If information is subsequently developed that would significantly affect a reader's understanding or perception of this event, a supplement to this LER will be submitted.

7. CORRECTIVE ACTIONS:

Palo Verde has revised the Control Room Fire procedure to add instructions to operate the breaker manually in the Train B switchgear room.

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

Any additional corrective actions taken as a result of this event will be implemented in accordance with Palo Verde's corrective action program.

8. PREVIOUS SIMILAR EVENTS:

In the past three years, Palo Verde has not reported a similar Appendix R issue.