



A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear
Generating Station

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102-05409-CE/SAB/DFH
February 10, 2006

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 2005-008-00**

Attached, please find Licensee Event Report (LER) 50-528/2005-008, which reports a failure to meet a Technical Specification (TS) that requires two Operable trains of inverters.

In accordance with 10 CFR 50.4, 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 James A. Proctor, Section Leader, Regulatory Affairs, at (623) 393-5730.

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,

A handwritten signature in black ink, appearing to be "J. Eubanks", is written over a horizontal line.

CE/SAB/DFH/ca

Attachment

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

NRC Region IV Regional Administrator
NRC Senior Resident Inspector for PVNGS
NRC NRR Project Manager

JE22

LICENSEE EVENT REPORT (LER)

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

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.

1. FACILITY NAME
PALO VERDE NUCLEAR GENERATING STATION UNIT 12. DOCKET NUMBER
050005283. PAGE
1 OF 44. TITLE
Inverter Failure - Technical Specification Violation - Unit 1

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
10	30	2005	2005	008	00	2	10	2006	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

Defueled

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

10. POWER LEVEL

0

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

James A. Proctor, Section Leader, Regulatory Affairs

TELEPHONE NUMBER (Include Area Code)

623-393-5730

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
B	PN	CAP	G080	YES					

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 October 30, 2005 at approximately 12:26 (MST), Unit 1 was de-fueled when distribution panel 1EPNBD26 failed (lost power). This failure resulted in the following actuations in the Control Room: Train B Containment Purge Isolation Actuation Signal (CPIAS), Fuel Building Essential Ventilation Actuation Signal (FBEVAS) and Control Room Essential Filtration Actuation Signal (CREFAS). Since the core was de-fueled and no irradiated fuel movement was in progress, no Technical Specification (TS) LCO entries were required. While evaluating the failure, the initial indication was an undervoltage condition on inverter 1EPNBN12. The inverter subsequently failed and local inverter alarms indicated a blown fuse. The cause of the inverter failure was from a failed capacitor within the inverter. Troubleshooting revealed the capacitor was defective (lacking dielectric oil). Eight of the fifteen capacitors were found without oil. Upon completion of the equipment root cause of failure on December 15, 2005, it was determined that the lack of oil condition would render the inverter inoperable, and as such, does not meet the requirements of Technical Specification 3.8.7, "Inverters - Operating".

No similar condition has been reported in the past three years.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Palo Verde Nuclear Generating Station Unit 1	05000528	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2005 --	008 --	00	

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

1. REPORTING REQUIREMENT(S):

Arizona Public Service (APS) is reporting this condition pursuant to 10 CFR 50.73(a)(2)(i)(B) for failing to meet a Technical Specification (TS) requirement.

Since the capacitors (EIS Code: CAP) were installed approximately 6 years earlier and an engineering evaluation could not determine if the system would have functioned as needed during an event, the inverter (EIS Code: INVT) was considered to be INOPERABLE, and, therefore, reportable as a TS violation.

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

Class 1E 120VAC Instrument (EIS Code: EF) Power System

The system consists of four redundant independent sub-systems each consisting of an inverter that converts 125 V DC (EIS Code: EJ) supply to 120 V AC, automatic and/or manual transfer switch, (manual transfer switches for unit #1; static transfer switch and manual bypass disconnect switches for units 2 and 3) a backup voltage regulator (regulating transformer) and a 120 V AC distribution panel. Each of the four sub-systems provides Class 1E 120 V AC power supply to one of the four redundant channels of the reactor protection system, and engineered safety features actuation system instrumentation and controls which are electrically and physically isolated from each other.

3. INITIAL PLANT CONDITIONS:

On October 30, 2005, at approximately 12:26 Mountain Standard Time (MST), Unit 1 was de-fueled for a Steam Generator Replacement and Refueling outage.

There were no other major structures, systems, or components that were inoperable at the start of the event that contributed to the event.

4. EVENT DESCRIPTION:

On 10/30/2005, at approximately 12:26 MST, Unit 1 was de-fueled for an outage when 1EPNBD26 malfunctioned causing the following actuations in the Control Room: Train B CPIAS, FBEVAS and CREFAS. The initial indication was an undervoltage on inverter

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

1EPNBN12. The inverter output voltage was noted to be oscillating from 0VAC to approximately 50VAC. The nominal inverter output voltage is 120VAC. During preparations to down power the inverter a blown fuse alarm indication came in. During troubleshooting activities, eight of the fifteen AC output filter capacitors in the C3/C4 capacitor banks were identified as having their oil fill/pressure relief plugs missing.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

Unit 1 was de-fueled at the time of the inverter failure. The inverter failure resulted in a loss of distribution panel 1EPNBD26 which resulted in actuations of Train "B" CPIAS, FBEVAS, and CREFAS. No TS LCO was entered as a result of the inverter failure.

The inverter operated as designed up until the failure occurred. After the defective capacitors were installed in October 1999 the inverter was successfully load tested and was subsequently successfully load tested in April of 2001 and again in October 2002.

All equipment and systems assumed in UFSAR, Chapter 15 were functional and performed as required.

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 or implications 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 condition would not have prevented the fulfillment of any safety function and did not result in a safety system functional failure as defined by 10 CFR 50.73(a)(2)(v).

6. CAUSE OF THE EVENT:

The direct cause of the inverter failure was internal shorts on the output filter capacitors. The root cause for the capacitor failure was the lack of "Dielektrol-VI Fluid" (oil) which was caused by a manufacturing process error. The affected capacitors were procured commercial grade and dedicated by Palo Verde for safety related use.

7. CORRECTIVE ACTIONS:

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
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An equipment root cause of failure was preformed on the failed inverter and inspections to identify the extent of the condition were completed in all three Units. No other inverters were found with a similar condition as the failed inverter. Additionally, the warehouse stock of similar capacitors were inspected and verified not to be affected.

Since this issue was not identified in the commercial grade dedication program, CRDR 2845813 was generated to evaluate the adequacy of the dedication process that was used to dedicate the affected capacitors.

8. PREVIOUS SIMILAR EVENTS:

No similar condition has been reported in the past three years.

9. ADDITIONAL INFORMATION:

None.