10 CFR 50.73

APS

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

Cliff Eubanks
Vice President
Nuclear Operations

Tel (623) 393-6116
Fax (623) 393-6077

Mail Station 7602
PO Box 52034
Phoenix, Arizona 85072-2034

102-05527-CE/SAB/JAP/DFH
July 05, 2006

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 3
Docket No. STN 50-530
License No. NPF 74
Licensee Event Report 2006-004-00

Attached please find Licensee Event Report (LER) 50-530/2006-004-00 prepared and submitted pursuant to 10 CFR 50.73. The LER reports an actuation of the A train emergency diesel generator due to a loss of power to one class bus (A train 4.16KV).

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 Senior Resident Inspector. If you have questions regarding this submittal, please contact James A. Proctor, Section Leader, Regulatory Affairs, at (623) 393-5730.

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

Sincerely,

CE/SAB/JAP/DFH/gt

Attachment

cc: B. S. Mallett — NRC Region IV Regional Administrator
M. B. Fields — NRC NRR Project Manager - (send electronic and paper)
G. G. Warnick — NRC Senior Resident Inspector for PVNGS

IE22

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
Palo Verde Nuclear Generating Station Unit 3	05000530	1 OF 6

4. TITLE

Emergency Diesel Generator Actuation on Loss of Power to A Train 4.16KV Bus

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
									None	05000
05	06	2006	2006	- 004 -	00	07	05	2006	FACILITY NAME: None	DOCKET NUMBER: 05000

9. OPERATING MODE

5

10. POWER LEVEL

N/A

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)
James A. Proctor, Section Leader, Regulatory Affairs - Compliance	(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

14. SUPPLEMENTAL REPORT EXPECTED

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

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
08	31	2006

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

On May 6, 2006, at approximately 16:35 Mountain Standard Time (MST) Unit 3 was in Mode 5, Cold Shutdown, when a loss of power (LOP) to the 'A' train class 4.16 kilo-volt (KV) bus (PBA-S03) occurred as a result of an undervoltage condition. Emergency Diesel Generator (EDG) A started and loaded as expected to re-energize PBA-S03. The loss of power to PBA-S03 occurred during Gas Turbine Generator (GTG) testing. GTG number 1 was supplying PBA-S03 at a lower than normal voltage when the normal supply breaker PBA-S03L opened due to the undervoltage condition which de-energized PBA-S03. The EDG started and all required related safety equipment started as expected.

The event is under investigation. Initial investigation results have identified the cause of the event is not having the GTG load adjusted properly to accept the full load from offsite power prior to opening the normal supply breaker for PBA-S03. Corrective actions taken included a calibration check of the local ammeter and a re-performance of the test after test steps were resequenced. After resequencing the test steps the GTG test was successful.

In the past three years, there were three similar events reported for a LOP to a safety bus (LER 50-529/2003-002-00, 50-529/530/2004-003-00, and 50-530/2006-003-00).

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Palo Verde Nuclear Generating Station Unit 3	05000530	2006	-- 004	-- 00	2 OF 6

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

1. REPORTING REQUIREMENT(S):

Arizona Public Service (APS) submits LER (50-530/2006-004-00) pursuant to 10 CFR 50.73(a)(2)(iv)(A), to report an actuation of the A train emergency diesel generator in response to a valid loss of power event to one class bus (3EPBAS03).

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

Class 1E AC System

Safety-related equipment is divided into two load groups. Either one of the associated load groups is capable of providing power for safely shutting down the unit. Each alternating current (AC) load group consists of one 4.16 kilo-volt (KV) bus (EIIS: EB), three 480V load centers (EIIS: ED), four 480V motor control centers (MCCs)(EIIS: ED), and two non-Class 1E MCCs (EIIS: ED). The preferred power source for each load group is off-site ac power (EIIS: EK).

Standby Power Supply [EIIS Code: EK]

The standby power supply for each safety-related load group consists of one emergency diesel generator (EDG)(EIIS: EK), complete with its accessories and fuel storage and transfer systems. The standby power supply functions as a source of AC power for safe plant shutdown in the event of loss of preferred power and for post-accident operation of engineered safety feature (ESF) loads.

Station Black Out and Gas Turbine Generator System

The station blackout gas turbine generation system (NE) consists of non-safety related generators, 13.8 KV switchgear and associated power distribution system used to deliver AC power from the gas turbine generators to the units.

The gas turbine system (GT) consists of two gas turbine driven generators (GTGs), either of which is capable of supplying the AC power to cope with a Station Black Out (SBO) at one unit.

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

The GTGs are located outside the protected area, plant east of Unit 1 and south of the Water Reclamation Facility (WRF) near the WRF boundary. Power cables are run to each unit in buried conduit duct banks.

The GT and NE systems together are designated as an independent Alternate AC (AAC). The AAC power system is equipped with a completely independent start system capable of a black start. The starting system is a battery backed direct current (DC) power source that is electrically independent from the PVNGS units' power systems. The system includes a separate diesel engine which drives a hydraulic start pump and motor to start the turbine.

The GTGs are not normally connected to the units. During a SBO, a GTG is started and then loaded manually onto a 13.8 KV bus. This requires local manual operation in the Turbine Control Room (TCR) as well as local manual closing of a circuit breaker at the 13.8 KV cubicle located at the affected unit's NAN-S03 bus.

3. INITIAL PLANT CONDITIONS:

Unit 3 was in Mode 5 at 50 psia and 140 F, Cold Shutdown, for a refueling outage at the time of the event. Shutdown Cooling (SDC)(EIIS: BP) train 'B' was operable and in service. Off site power (preferred) was providing power to both 'A' and 'B' train components. Operations and engineering personnel were performing a Gas Turbine Generator test on the A train class 4.16 KV bus at the time of the event.

4. EVENT DESCRIPTION:

On May 6, 2006, at approximately 16:35 Mountain Standard Time (MST), Unit 3 experienced a valid loss of power (LOP) actuation on the train 'A' 4.16 kV safety bus. The event occurred during the performance of an isochronous test for the station's GTGs.

Both GTGs were started for the test. Control room operators (licensed), in conjunction with water reclamation facility (WRF) operators (non-licensed), then paralleled GTG #1 to the offsite power supplying Unit 3 'A' train (PBA-S03). Once paralleled to PBA-S03, loads were shifted from the normal offsite power to GTG #1. With a steady load on PBAS03, area operators (non-licensed) determined the amperage (load) on PBAS03 by

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

recording 220 amps on the local ammeter at breaker PBAS03L (breaker for normal supply to PBAS03). Emergency Response Facility Data Acquisition Display System (ERFDADS) trends taken after the event indicate that PBAS03 amperage was 250 amps. The procedure required operators to multiply the amperage from the local meter by a factor of .3 to determine the amount of load to place on GTG #1 (220 amps x .3 = 66 amps). The Unit 3 control room operator then coordinated with the WRF operator (non-licensed) to increase GTG #1 load to achieve 66 amps locally on GTG #1 and zero (0) amps through breaker NANS03A as read by the Unit 3 area operator at the local ammeter. With 66 amps at GTG #1 and "0" amps through breaker NANS03A the Unit 3 control room operator opened breaker NANS03A to transfer all load on PBAS03 to GTG #1. WRF operators then commenced performance of steps of the test procedure which had four sub steps. WRF operators had completed the first step, and were proceeding to perform the second sub step when a loss of power occurred on PBAS03 at 16:35 MST due to an undervoltage condition on PBAS03. Emergency Diesel Generator (EDG) A started and loaded as expected to re-energize PBA-S03.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

Unit 3 was in mode 5 with 'B' train shutdown cooling loop in service with Reactor Coolant System (RCS) loops filled and both steam generator levels greater than 25% wide range. This met technical specification Limiting Condition for Operation (LCO) 3.4.7 for RCS loops filled in mode 5. LCO 3.8.2, AC Sources Shutdown, was met with the 'B' train EDG operable and offsite power supplying the 'B' train. The plant conditions supported performance of GTG test which would parallel the GTGs to offsite power and divorce offsite power from supplying PBAS03 ('A' train) such that the GTGs would carry the full load on PBAS03. With required 'B' train AC sources available and 'A' shutdown cooling not required, no nuclear safety condition existed with the loss of power to PBAS03 during performance of the GTG test.

Power to PBAS03 was lost due to an undervoltage condition. After paralleling GTG #1 to offsite power, the undervoltage condition occurred approximately 42 seconds after offsite power was removed and GTG #1 was supplying on PBAS03. Test steps were in progress to place the GTG in isochronous mode when breaker PBAS03L opened on an undervoltage condition on PBAS03. This condition would not occur during a SBO condition because the GTG would be placed on a class bus that was deenergized in the

isochronous mode. A review of emergency procedures found no condition where the GTGs are paralleled to offsite power for the purpose of placing the GTG in service on a class bus. Later on May 6, 2006, after procedure steps were resequenced, the test was performed successfully demonstrating that the GTGs can operate with steady state and transient loads in the isochronous mode. Therefore, no nuclear safety condition existed with the design function of the GTGs in a SBO event.

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 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 condition would not have prevented the fulfillment of any safety function of structures or systems as defined by 10 CFR 50.73(a)(2)(v).

6. CAUSE OF THE EVENT:

The direct cause of the loss of power (LOP) on PBAS03 was due to an undervoltage condition that occurred while transferring offsite power to GTG #1. With GTG #1 at a set load, amps increased and voltage dropped to compensate for the higher load until breaker PBAS03L opened on undervoltage causing a LOP on PBAS03.

The root cause is under investigation and will be reported in a supplement to this LER.

7. CORRECTIVE ACTIONS:

This event is still under investigation. Initial investigation results have identified the cause of the event is not having the GTG load adjusted properly to accept the full load from offsite power prior to opening the normal supply breaker for PBA-S03. Corrective actions taken included verifying the calibration of the local ammeter and reperforming the test after test steps was resequenced. After resequencing the test steps the GTG

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTAL NUMBER	REVISION NUMBER	
Palo Verde Nuclear Generating Station Unit 3	05000530	2006	-- 004	-- 00	6 OF 6

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

test was successful. The GTG isochronous test procedure is scheduled to be rewritten to prevent recurrence of this event.

Any additional corrective actions taken as a result of the investigation of this event will be implemented in accordance with the APS corrective action program.

8. PREVIOUS SIMILAR EVENTS:

In the past three years, there were three similar events reported for a LOP to a safety bus (LER 50-529/2003-002-00, 50-529/530/2004-003-00, and 50-530/2006-003-00). The causes for the previously reported events were different than the root cause for the event discussed in this LER. As such, the corrective actions taken as a result of the previously reported event would not have prevented the event discussed in this LER.