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102-05243-DMS/SAB/DJS
April 6, 2005

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 2005-001-00**

Attached please find Licensee Event Report (LER) 50-528/2005-001-00 prepared and submitted pursuant to 10 CFR 50.73. This LER reports an event resulting in the actuation of one of the Unit 1 emergency diesel generators.

In accordance with 10 CFR 50.4, a copy of this LER is being forwarded to the NRC Region IV Office and the Senior 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.

Sincerely,

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

DMS/SAB/DJS/ca

JE22

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U. S. Nuclear Regulatory Commission
Licensee Event Report 50-528/2005-001-00
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Attachment

cc: B. S. Mallet, Region IV Administrator (all w/attachment)
G. G. Warnick, Sr. Resident Inspector
M. B. Fields, PVNGS Project Manager

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 (PVNGS) Unit 1	2. DOCKET NUMBER 05000528	3. PAGE 1 OF 7
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4. TITLE
Actuation of an Unit 1 Emergency Diesel Generator (EDG)

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	
02	06	2005	2005	- 001 -	00	04	06	2005	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 100	<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)(viii)(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)(viii)(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 checked="" 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 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							

12. LICENSEE CONTACT FOR THIS LER

FACILITY 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	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	EA	BU	G080	Y					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

On February 6, 2005, at approximately 22:19 Mountain Standard Time (MST) a valid actuation of the PVNGS Unit 1 Train 'B' EDG occurred as a result of under-voltage on its respective safety bus (PBB-S04). EDG 'B' started and loaded as designed to energize PBB-S04. The loss of power to the safety bus was the result of a fault associated with a 13.8KV load breaker cubicle which caused the breaker for the normal power supply to switchgear 1E-NANS06 to trip open on over-current. The PVNGS Fire Department and Auxiliary Operators responded to a report of smoke and upon arrival found no fire. The Fire Department verified the fire was completely extinguished and there were no secondary fires.

Unit 1 entered Technical Specification LCO 3.8.1, Condition 'A', for one (of two) required offsite circuits inoperable. Various other Technical Specifications LCO's were momentarily entered and exited for PBB-S04 being de-energized for approximately 7 seconds. No Emergency Plan declaration was made and none was required. Unit 1 was at approximately 100% power, at normal operating temperature and pressure prior to and following the EDG actuation. No other ESF actuations occurred and none were required. The event did not adversely affect the safe operation of the plant or the health and safety of the public.

Previous similar events have been reported in LERs 50-528/2004-006, 50-529/2004-003-00 and 50-530/2003-004.

LICENSEE EVENT REPORT (LER)

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Palo Verde Nuclear Generating Station Unit 1	05000529	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 7
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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)(iv)(A), this LER reports an event that resulted in the valid automatic actuation of one of the Unit 1 emergency diesel generators (EDGs) [EIS Code: EB].

Pursuant to 10 CFR 50.72(b)(3)(iv)(A), Arizona Public Service Company (APS) made notification of this event to the NRC Headquarters Operations Officer on February 7, 2005 (reference ENS # 41379).

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

Onsite Power System [EIS Codes: EA, EB & EC]

Offsite sources of power provide preferred power to the three units through the secondary windings of three startup transformers. The onsite power system of each unit is divided into two separate systems: the non-Class 1E power system and the Class 1E power system which is divided into two separate load groups. Power is supplied to the auxiliaries at 13.8 kV, 4.16 kV, and 480V levels. The onsite power system includes the Class 1E power system which provides auxiliary ac and dc power for equipment used to shut down the reactor safely following a design basis event. The Class 1E busses of each unit must be energized in order to provide preferred or standby power to the safety-related loads of each unit.

Standby Power Supply [EIS Code: EK]

The standby power supply for each safety-related load group consists of one emergency diesel generator (EDG), complete with its accessories and fuel storage and transfer systems. The standby power supply functions as a source of alternating current (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.

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3. INITIAL PLANT CONDITIONS:

On February 6, 2005, at approximately 22:19 Mountain Standard Time (MST), Unit 1 was in Mode 1 (POWER OPERATION), operating at approximately 100 percent power.

There were no 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 involved.

4. EVENT DESCRIPTION:

On February 6, 2005, at approximately 22:19 Mountain Standard Time (MST) a valid actuation of the Palo Verde Nuclear Generating Station Unit 1 Train 'B' Emergency Diesel Generator (EDG) occurred as a result of under-voltage on its respective safety bus (PBB-S04). EDG 'B' started and loaded as designed to energize PBB-S04. The loss of power to the safety bus was the result of a fault associated with 13.8KV breaker NAN-S06J cubicle which caused breaker NAN-S06H (normal power supply), to trip open on over-current. This action resulted in the de-energization of NAN-S06, NAN-S04, and PBB-S04. Circuit breaker NAN-S06J (EOF & TSC Bldg power supply) was also found in an open state.

The PVNGS Fire Department and Auxiliary Operators responded to a report of smoke and upon arrival found no fire. The Fire Department verified the fire was completely extinguished and there were no extensions (secondary fires).

Unit 1 entered Technical Specification LCO 3.8.1, Condition 'A', for one (of two) required offsite circuits inoperable. Various other Technical Specifications LCO's were momentarily entered and exited for PBB-S04 being de-energized for approximately 7 seconds. No Emergency Plan declaration was made and none was required. Unit 1 was at approximately 100% power, at normal operating temperature and pressure prior to and following the EDG actuation. No other ESF actuations occurred and none were required. No major equipment was inoperable prior to the event that contributed to the event.

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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 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 10CFR50.73(a)(2)(v).

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.

6. CAUSE OF THE EVENT:

The direct cause of the 1E-NAN-S06 power failure was an electrical fault in cubicle 'J' within the line side primary disconnect assembly (rosette) compartment above the circuit breaker. This electrical fault initiated as a 'C' phase to ground fault and transitioned to a three phase to ground fault. The electrical fault was terminated by the normal bus feeder circuit breaker 1ENANS06H opening due to protective relaying. Most probable root/contributing causes for the direct cause are: contamination with tracking over the exterior of the rosette, high resistance bushing-finger connection within the rosette, rosette cracked porcelain, water intrusion or a combination of these.

7. TRANSPORTABILITY:

Circuit breaker 1ENANS06J is located in an outdoor 13.8 KV GE switchgear enclosure. There are the following similar GE switchgear enclosures at PVNGS:

- Twelve (4/unit) outdoor 13.8 KV Non-1E switchgear enclosures (E-NAN-S03/4/5/6); 37 breaker cubicles.
- Six (2/unit) indoor 13.8 KV Non-1E switchgear enclosures (E-NAN-S01/2); 66 breaker cubicles.

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- Six (2/unit) indoor 4.16 KV 1E switchgear enclosures (E-PBA/B-S03/4); 81 breaker cubicles.
- Six (2/unit) indoor 4.16 KV Non-1E switchgear enclosures (E-NBN-S01/2); 51 breaker cubicles.

Note, indoor 13.8 KV QAG switchgear enclosure AE-NAN-S07 has a different bus structure and the five respective vacuum circuit breakers are racked in horizontally; hence initial indications are this failure is not transportable to AENANS07.

Contamination with tracking - Inspection of other bus side primary disconnect assemblies (rosettes) in 1ENANS06 cubicles and the line (load) side rosettes in cubicle 1ENANS06K found reasonably clean conditions (low contamination to contribute to tracking) and no degraded conditions. The outdoor enclosures are the most challenged by dust and are cleaned each refueling cycle. Based on the condition of the rosettes inspected in 1ENANS06, contamination is not deemed an immediate transportability concern.

High resistance connection - Industry operating experience (IOE) consolidated and reviewed found very few incidence of primary disconnect assembly (rosette) failure. The applicable IOE identified high resistance overheating of the connection between primary disconnect assembly (rosette) fingers and circuit breaker bushing due to old hardened grease, misalignment and missing silver plating. The fingers within the interior of the bus and line rosettes in the outdoor 13.8 KV switchgear are inspected and cleaned each refueling cycle as per maintenance procedure 32MT-9ZZ91. Proper rosette finger and circuit breaker stab contact is validated during circuit breaker alignment as per maintenance procedure 32MT-9ZZ33. Based on these procedure actions, there is reasonable assurance of a good circuit breaker bushing to rosette fingers connection; therefore rosette high resistance connections are not deemed an immediate transportability concern. Industry operating experience indicates thermography may be utilized to find primary disconnect high resistance by detecting the related heat on an adjacent sheet metal compartment wall/cover.

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Cracked porcelain - Industry operating experience (IOE) consolidated and reviewed found no incident of primary disconnect assembly (rosette) porcelain failure. If rosette cracked porcelain is the most probable cause for this failure; the probability of more rosettes with porcelain cracked at PVNGS is very low based on no failures of this type identified during IOE. Therefore rosette cracked porcelain is not deemed an immediate transportability concern.

Water Intrusion - No initial evidence of water was found; nor was rain a challenge to the switchgear enclosure just prior to or during the event. Additionally, rain occurred during restoration of the switchgear enclosure; no water intrusion into the circuit breaker cubicles occurred during restoration of the switchgear enclosure.

8. CORRECTIVE ACTIONS:

The following maintenance/repairs activities were completed prior to 1ENANS06 being re-energization:

- CMWO 2775016 - primary disconnect assembly (rosette) inspection, bus inspection, circuit breaker H & K inspect/adjust, circuit breaker alignment verification, control wiring replacement.
- CMWO 2755660 - 52Y anti-pump relay replacement on circuit breaker 1ENANS06H.
CMWO 2755688 - 52Y anti-pump relay replacement on circuit breaker 1ENANS06K.
DFWO 2776409 - 1ENANS06 bus repair in cubicles H, J and K; cubicle J control wiring isolation.
- T-Mod 2775284 - EOF & TSC temporary power from 1ENANS05K.
- T-Mod 2776424 - Control wiring and line side bus connections to cubicle 1ENANS06K.

The following condition was evaluated after 1ENANS06 being re-energized:

- DFWO 2782601 - Conditional Release for T-Mod 2775284 (EOF & TSC temporary power from 1ENANS05K) without protective 1ENANS06J trip inputs.

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9. PREVIOUS SIMILAR EVENTS:

Switchyard and EHV grid events that have affected PVNGS have been reported in LERs 50-528/2004-006-00, 50-529/2004-003-00 and 50-530/2003-004-00. However, these previous events or conditions did not involve the same underlying concern or reason as this event, such as the same root cause, failure, or sequence of events. There have been no previous similar events in the past three years that had a similar failure mechanism or that should have prevented this event from previously implemented corrective actions.