



*A subsidiary of Pinnacle West Capital Corporation*

**10 CFR 50.73**

Palo Verde Nuclear  
Generating Station

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**102-06544 - DCM/TNW/MAM/DLK**  
**July 09, 2012**

**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 Nos. NPF-41, NPF-51, and NPF-74**  
**Licensee Event Report 2012-002-00**

Enclosed, please find Licensee Event Report (LER) 50-528/2012-002-00 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER reports a condition prohibited by Technical Specifications (TS). Specifically, during conditions where essential air handling units were inoperable, the affected supported systems' TS Limiting Conditions for Operation were not entered.

In accordance with 10 CFR 50.4, copies of this LER are being forwarded to the Nuclear Regulatory Commission (NRC) Regional Office, NRC Region IV and the Senior Resident Inspector. If you have questions regarding this submittal, please contact Mark McGhee, Operations Support Manager, Regulatory Affairs, at (623) 393-4972.

Arizona Public Service Company makes no commitments in this letter.

Sincerely,

DCM/TNW/MAM/DLK/hsc

**Enclosure**

cc: E. E. Collins Jr. NRC Region IV Regional Administrator  
L. K. Gibson NRC NRR Project Manager for PVNGS  
M. A. Brown NRC Senior Resident Inspector for PVNGS

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance

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<b>NRC FORM 366</b> (10-2010)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		APPROVED BY OMB: NO. 3150-0104		EXPIRES: 10/31/2013																																					
<b>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)																																											
<b>1. FACILITY NAME</b> Palo Verde Nuclear Generating Station (PVNGS) Unit 1				<b>2. DOCKET NUMBER</b> 05000528		<b>3. PAGE</b> 1 OF 8																																					
<b>4. TITLE</b> Supported Systems Not Considered Inoperable With Support Equipment Inoperable																																											
<b>5. EVENT DATE</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:10%;">MONTH</th> <th style="width:10%;">DAY</th> <th style="width:10%;">YEAR</th> </tr> <tr> <td style="text-align: center;">01</td> <td style="text-align: center;">22</td> <td style="text-align: center;">2012</td> </tr> </table>			MONTH	DAY	YEAR	01	22	2012	<b>6. LER NUMBER</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:10%;">YEAR</th> <th style="width:10%;">SEQUENTIAL NUMBER</th> <th style="width:10%;">REV NO.</th> </tr> <tr> <td style="text-align: center;">2012</td> <td style="text-align: center;">- 002 -</td> <td style="text-align: center;">00</td> </tr> </table>			YEAR	SEQUENTIAL NUMBER	REV NO.	2012	- 002 -	00	<b>7. REPORT DATE</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:10%;">MONTH</th> <th style="width:10%;">DAY</th> <th style="width:10%;">YEAR</th> </tr> <tr> <td style="text-align: center;">07</td> <td style="text-align: center;">09</td> <td style="text-align: center;">2012</td> </tr> </table>			MONTH	DAY	YEAR	07	09	2012	<b>8. OTHER FACILITIES INVOLVED</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:70%;">FACILITY NAME</th> <th style="width:30%;">DOCKET NUMBER</th> </tr> <tr> <td>PVNGS Unit 2</td> <td style="text-align: center;">05000529</td> </tr> <tr> <td>PVNGS Unit 3</td> <td style="text-align: center;">05000530</td> </tr> </table>		FACILITY NAME	DOCKET NUMBER	PVNGS Unit 2	05000529	PVNGS Unit 3	05000530									
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<b>9. OPERATING MODE</b> <div style="text-align: center; font-size: 1.2em;">1/1/1</div>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)</b> <table style="width:100%;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td></td> </tr> </table> <div style="text-align: right; font-size: 0.8em;">Specify in Abstract below or in NRC Form 366A</div>						<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 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)	
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<p><b>ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</p> <p>On May 9, 2012, a review of the procedural guidance for inoperable essential ventilation equipment by an investigation team concluded that a condition prohibited by Technical Specifications (TS) had occurred in unit 2 on January 22, 2012, when the TS requirements for electrical distribution equipment were not met.</p> <p>On January 22, 2012, during surveillance testing in unit 2, a control relay did not change state as expected and the essential ventilation dampers controlled by this relay did not change position. Operations declared the affected essential air handling units inoperable. The TSs do not contain specific Limiting Conditions for Operation (LCO) requirements for the affected essential ventilation equipment and no TS LCO Conditions were entered. Operations followed existing procedural guidance for inoperable ventilation equipment. The procedural guidance required operations to verify that there was no loss of safety function and that normal room cooling was available.</p> <p>The cause of the event was an inadequate procedure that was based on an incorrect understanding of the relationship between essential ventilation equipment that provides a support function to electrical distribution equipment and operability of the electrical distribution equipment. As corrective action, the affected procedure was revised.</p> <p>Similar reportable events have not occurred in the past three years.</p>																																											

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All times are Mountain Standard Time and approximate unless otherwise indicated.

**1. REPORTING REQUIREMENT(S):**

This LER is being submitted pursuant to 10 CFR 50.73 (a)(2)(i)(B) as a condition prohibited by Technical Specifications (TS) 3.8.4, 3.8.9, and 3.0.3 when inoperable essential ventilation system equipment rendered the supported electrical distribution equipment inoperable for a period greater than the TS Required Action Completion Time.

The condition which resulted in the inoperable essential ventilation equipment occurred on January 22, 2012, and was not initially determined to be reportable as a condition prohibited by TS because administrative controls for inoperable essential ventilation equipment were considered adequate and no specific TS requirements exist for the support equipment. On May 9, 2012, the event was discussed on a teleconference with the Nuclear Regulatory Commission (NRC). Following the teleconference, a review of the procedural guidance for inoperable essential ventilation equipment concluded that a condition prohibited by TS had occurred when the TS requirements for the supported electrical distribution equipment were not met. The condition is applicable to Units 1, 2, and 3 because the procedural guidance has been used in each unit to manage inoperable essential ventilation equipment.

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

The safety related electrical power distribution systems are divided into two trains that provide sufficient electrical power to ensure the availability of engineered safety feature (ESF) systems so that the fuel, reactor coolant system, and containment design limits are not exceeded. Each train of electrical equipment includes electrical switchgear, load centers, motor control centers, distribution panels, auxiliary relay cabinets, inverters, battery chargers and batteries. These components are located in their respective train related rooms in the control building (EISS: NA). Additionally, safety related electrical motor control centers and auxiliary relay cabinets are located in train related electrical penetration rooms (EISS: NF) in the auxiliary building (EISS: NF). In both the control and auxiliary buildings, the rooms containing safety related electrical distribution equipment

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are serviced by both normal and essential ventilation (EIS: VI) and chilled water systems (EIS: VF).

During normal operation, the normal chilled water system (WC) (EIS: KM) and the normal heating, ventilation, and air conditioning (HVAC) system (EIS: VI) provide space cooling. The WC and normal HVAC systems are non-safety grade systems. The essential chilled water system (EC) (EIS: KM) together with the essential ventilation systems provide space cooling during design basis accidents (DBA) or transient conditions. The EC system transfers heat from the safety related essential ventilation systems to the ultimate heat sink through the essential cooling water (EIS: BI) and spray pond systems (EIS: BS). The EC system and the related air handling units (AHU) and air cooling units (ACU) are actuated by a safety injection actuation signal (EIS: JE) or loss of power signal (EIS: JE), to provide cooling to the supported electrical distribution equipment.

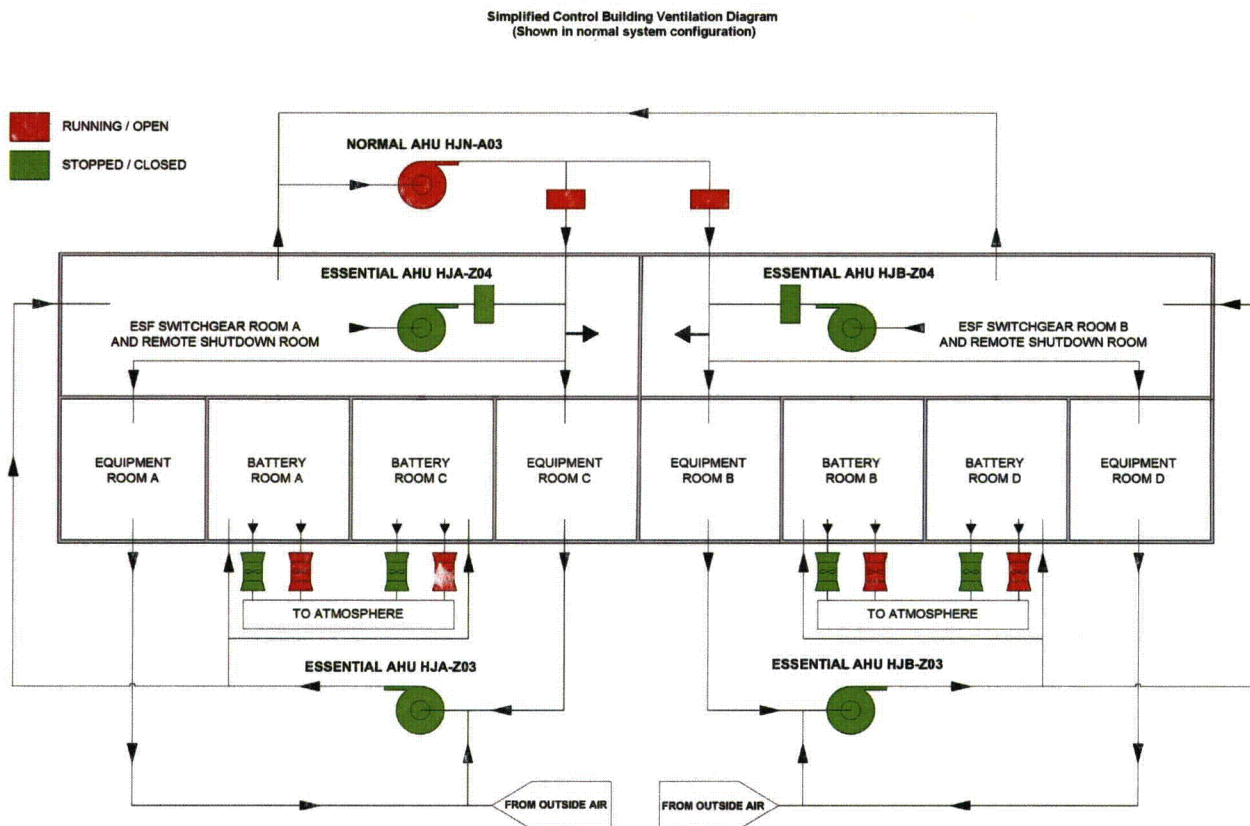
The control building essential ventilation equipment includes the fans, cooling coils, dampers, ductwork, and controls that provide space cooling to the safety related electrical switchgear and equipment rooms. The ESF switchgear room essential AHUs (HJA-Z03 and HJB-Z03) (EIS: AHU) furnish cooled air to maintain room temperatures in the respective train battery rooms, remote shutdown rooms, and the ESF switchgear rooms. The ESF equipment room essential AHUs (HJA-Z04 and HJB-Z04) (EIS: AHU) furnish cooled air to the respective train equipment rooms and also the ESF switchgear rooms (EIS: NA).

(See simplified flow diagram on page 4)

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Each of the electrical penetration room essential ACUs (not shown above) (HAA-Z06 and HAB-Z06) (EIS: ACU) consists of a fan, cooling coil, ductwork, and controls which provide space cooling to the respective electrical penetration rooms in the auxiliary building.

3. INITIAL PLANT CONDITIONS:

On January 22, 2012, Palo Verde Units 1, 2, and 3 were in Mode 1 (Power Operations) operating at approximately 100 percent power. There were no other structures, systems, or components inoperable at the time of the event that contributed to the event.

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**4. EVENT DESCRIPTION:**

On May 9, 2012, during an event investigation, a review of the procedural guidance for inoperable essential ventilation equipment by the investigation team concluded that a condition prohibited by TS had occurred in Unit 2 on January 22, 2012, when the TS requirements for train "B" electrical distribution equipment were not met.

On January 22, 2012, at 03:19, while conducting engineered safety feature actuation system (EISS: JE) train "B" subgroup relay testing in Unit 2, a ventilation damper control relay (EISS: DMP, RLY) did not change state as expected and the essential ventilation dampers (EISS: DMP) controlled by this relay did not change position. Operations declared the ESF switchgear room essential AHUs and ESF equipment room essential AHUs (HJB-Z03 and HJB-Z04) inoperable because the affected dampers would not automatically align ventilation flow through the AHUs during DBA and transient conditions. The TSs do not contain specific Limiting Conditions for Operation (LCO) requirements, Conditions, or Required Actions for the affected essential ventilation equipment and no TS LCO Actions were entered. Operations followed existing procedural guidance for inoperable ventilation equipment contained in procedure 40ST-9EC03, "Essential Chilled Water and Ventilation Systems Inoperable Action Surveillance." As required by the procedural guidance, operations verified that the train "A" ESF switchgear room essential AHUs, ESF equipment room essential AHUs, and electrical distribution equipment remained OPERABLE and capable of performing their safety functions throughout the event. The procedural guidance also limited the allowable out of service time for HJB-Z03 and HJB-Z04 to less than 72 hours.

The May 9, 2012, procedure review determined that the following TS Conditions and associated Required Actions were affected during the January 22, 2012, event:

LCO 3.8.4 DC Sources - Operating

LCO 3.8.7 Inverters - Operating

LCO 3.8.9 Distribution Systems - Operating

LCO 3.0.3 is applicable because TS LCO 3.8.7 provides no associated Required Action for two inoperable inverters.

Because the above listed LCOs were not entered, the associated Completion Times were not met. The supported electrical equipment was inoperable for nine hours and fifty-one

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minutes, which exceeded the Completion Times of LCO 3.0.3, LCO 3.8.4 Condition B, and LCO 3.8.9 Condition D.

**5. ASSESSMENT OF SAFETY CONSEQUENCES:**

This condition did not adversely affect plant safety or the health and safety of the public. There were no actual safety consequences as a result of this event and the condition did not result in any challenges to the fission product barriers or result in any releases of radioactive materials.

When HJB-Z03 and HJB-Z04 were declared inoperable in Unit 2 on January 22, 2012, operations personnel followed the procedural guidance in procedure 40ST-9EC03. Operations verified that there was no loss of safety function and that normal room cooling was available. The procedural guidance also limited the allowable out of service time for inoperable AHUs to less than 72 hours. The train "A" ESF switchgear room essential AHUs, ESF equipment room essential AHUs, and electrical distribution equipment remained OPERABLE and capable of performing their safety functions throughout the event.

The risk of a DBA was very low during the period that the safety related electrical distribution equipment was inoperable. The out of service time for HJB-Z03 and HJB-Z04 was limited to 72 hours, similar to the TS LCO time limit for the EC system. The procedural guidance also required that initial and periodic cross train checks be performed to verify operability of redundant train ESF systems to ensure that no loss of safety function existed.

This event would not have prevented the fulfillment of a safety function to safely shutdown the reactor and did not result in a safety system functional failure as described by 10 CFR 50.73(a)(2)(v).

**6. CAUSE OF THE EVENT:**

The cause of the event was an inadequate procedure (40ST-9EC03) that was based on an incorrect understanding of the relationship between essential ventilation equipment



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that provides a support function to electrical distribution equipment and operability of the electrical distribution equipment. The inadequate procedure guidance was established in 1991 and was based on a TS interpretation (developed in March 1991 but since cancelled) which incorrectly concluded that the effects of an inoperable essential AHU would not render the supported electrical distribution equipment inoperable, provided adequate compensatory actions were taken. The 1991 TS interpretation used action requirements from the original (i.e., prior to improved TS) TS 3.7.6, "Essential Chilled Water System." The current improved TS for the EC system (3.7.10) does not include the same guidance as the original TS 3.7.6.

The ventilation damper control relay failure discussed in the Event Description of this Licensee Event Report is not considered to be the cause of this event. The failed relay was an element in the event that initiated the questions which subsequently led to the conclusion that an inadequate procedure resulted in a condition prohibited by TS. Specifically, the procedure permitted placing the plant in a condition that did not conform to the single failure criterion without formally entering the TS LCO Actions for the affected equipment. Because the procedural guidance was contained in a common unit procedure, the condition is applicable to Units 1, 2, and 3. A review of the unit logs over the past three years confirmed that the procedure was used in units 1, 2, and 3. Use of the procedural guidance in procedure 40ST-9EC03 resulted in multiple past violations of TS LCO 3.8.4, 3.8.9, and, 3.0.3 in units 1, 2, and 3.

**7. CORRECTIVE ACTIONS:**

The procedure 40ST-9EC03 was revised on May 11, 2012, to remove the inadequate procedural guidance and incorporate a fundamental change in addressing inoperable essential ventilation equipment that do not have TS requirements that support safety related electrical distribution equipment. Immediate operability determinations are now required for TS related electrical distribution equipment supported by inoperable essential ventilation equipment or the supported system must be declared inoperable.

The investigation of this event is still open. Any additional corrective actions taken as a result of the investigation will be implemented in accordance with the requirements of the Palo Verde corrective action program. If information is subsequently developed which



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would significantly affect a reader's understanding or perception of this event, a supplement to this LER will be submitted.

8. PREVIOUS SIMILAR EVENTS:

Similar events have not occurred in the past three years related to inadequate procedures based on incorrect understanding of the relationship between essential ventilation equipment and operability of supported electrical distribution equipment.