

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION IV 1600 EAST LAMAR BLVD ARLINGTON, TEXAS 76011-4511

November 13, 2013

Randall K. Edington, Executive Vice President, Nuclear/CNO Mail Station 7602 Arizona Public Service Company P.O. Box 52034 Phoenix, AZ 85072-2034

#### SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000528/2013004, 05000529/2013004, AND 05000530/2013004

Dear Mr. Edington:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Palo Verde Nuclear Generating Station Units 1, 2, and 3. On October 3, 2013, the NRC inspectors discussed the results of this inspection with D. Mims and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors documented two findings of very low safety significance (Green) in this report. One of these findings involved a violation of the NRC requirements, and is being dispositioned as a non-cited violation (NCV).

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Palo Verde Nuclear Generating Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV; and the NRC resident inspector at the Palo Verde Nuclear Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <u>http://www.nrc.gov/reading-rm/adams.html</u> (the Public Electronic Reading Room).

R. Edington

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Sincerely,

/RA/ B. Hagar for/

Ryan Lantz, Chief Project Branch D Division of Reactor Projects

Docket Nos.: 50-528, 50-529, 50-530 License Nos: NPF-41, NPF-51, NPF-74

Enclosure: Inspection Report 05000528/2013004, 05000529/2013004, and 05000530/2013004 w/Attachment: Supplemental Information

Electronic Distribution to Palo Verde Nuclear Station

R. Edington

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#### **U.S. NUCLEAR REGULATORY COMMISSION**

#### **REGION IV**

- Docket: 05000528, 05000529, 05000530
- License: NPF-41, NPF-51, NPF-74
- Report: 05000528/2013004, 05000529/2013004, 05000530/2013004
- Licensee: Arizona Public Service Company
- Facility: Palo Verde Nuclear Generating Station, Units 1, 2, and 3
- Location: 5951 South Wintersburg Road Tonopah, Arizona
- Dates: July 1 through September 30, 2013
- Inspectors: J. Reynoso, Acting Senior Resident Inspector M. Baquera, Resident Inspector D. Reinert, Resident Inspector
  - J. Laughlin, Emergency Preparedness Inspector, NSIR
- Approved Ryan Lantz, Chief, Project Branch D By: Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000528, 529, 530/2013004; 07/01/2013 – 09/30/2013; Palo Verde Nuclear Generating Station Units 1, 2, and 3; Integrated Resident and Regional Report, Identification & Resolution of Problems, Event Followup

The inspection activities described in this report were performed between July 01, 2013, and September 30, 2013, by the resident inspectors at Palo Verde Nuclear Generating Station. Two findings of very low safety significance (Green) are documented in this report. One of these findings involved a violation of the NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." Violations of the NRC requirements are dispositioned in accordance with the NRC s Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

## A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

Green. The inspectors identified a Green finding for the failure of licensee personnel to follow Procedure 30DP-9MP08, "Preventive Maintenance Program." Specifically, plant personnel did not ensure that requirements for performing inspection and replacement of degraded tie-wraps in electrical cubicles were contained in preventative maintenance basis documents. Consequently, degraded cable tie-wraps in Unit 1 load center L02, were not inspected prior to, and resulted in a catastrophic electrical fault on July 2, 2013. The licensee rebuilt the load center cubicle and has entered this issue into their corrective action program as Palo Verde Action Request 4454845.

The failure to follow established procedures for updating preventive maintenance basis documents with requirements and recommendations from previous component failures was a performance deficiency. This performance deficiency is more than minor, and therefore is a finding, because it was associated with the procedure quality attribute of the Initiating Events Cornerstone and adversely affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, by not including the requirements and recommendations from the history of previous failures in the preventive maintenance basis, the licensee did not consider pertinent operating experience when evaluating changes to the preventive maintenance program. Consequently, the licensee did not inspect degraded cable tie-wraps in Unit 1 load center L02, prior to experiencing a catastrophic electrical fault on July 2, 2013, that upset plant stability. The inspectors used the NRC Inspection Manual Chapter 0609, Appendix A, " The Significance Determination Process (SDP) for Findings At-Power," to determine the significance. The finding was of very low safety significance (Green) because it did not contribute to both the likelihood of

a reactor trip and the likelihood that mitigation equipment or functions would not be available. The issue had a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience component because the licensee did not implement and institutionalize operating experience through changes to the station's preventive maintenance program [P.2(b)]. (Section 4OA3)

Cornerstone: Emergency Preparedness

• <u>Green</u>. The inspectors identified a non-cited violation of 10 CFR 50.54 (q)(2) for the failure to maintain an effective emergency plan action level scheme in accordance with 50.47(b)(4). Specifically, the Alert threshold for HA1.1, "Natural or Destructive Phenomena Affecting VITAL AREAS," requires a declaration of an Alert for a seismic event greater than operating basis earthquake as indicated by any force balance accelerometer reading greater than 0.10g. Operators rely on alarms to verify ground acceleration beyond the operating basis earthquake and the inspectors determined the seismic monitor alarm set point was 0.13g. This could result with the inability of operations personnel to classify an event at the Alert level. A design change modified the seismic monitoring set point to 0.1g and restored compliance. The licensee entered the issue into their corrective action program as Palo Verde Action Request 3624077.

The failure to maintain an effective emergency action level scheme was a performance deficiency. The performance deficiency was more than minor, and therefore is a finding, because it adversely affected the Emergency Response Organization Performance attribute of the Emergency Preparedness Cornerstone and its objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee's ability to declare an Alert based on Natural Phenomenon at the correct threshold was degraded. The inspectors assessed the significance of the finding in accordance with the NRC Inspection Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Figure 5.4-1, and determined the finding to be of very low safety significance because compensatory measures were available for emergency response organization personnel to perform the classification duties. The inspectors determined the cause of this finding is not indicative of current performance and therefore no cross-cutting aspect is assigned. (Section 4OA2)

## B. <u>Licensee-Identified Violations</u>

None

# PLANT STATUS

Unit 1 began the inspection period at essentially full power. On July 2, 2013, the unit experienced a reactor power cutback to approximately 57 percent power after a 480 Volt load center fault caused main feedwater pump B to trip. The licensee completed repairs and returned the unit to essentially full power on July 6, 2013. On August 17, 2013, the licensee reduced power to 98 percent for maintenance on a feedwater heater level control valve and returned the unit to essentially full power on August 18, 2013. On September 16, 2013, the licensee reduced power to 98 percent to complete the maintenance on the feedwater heater level control valve and returned the unit to essentially full power on August 18, 2013. On September 16, 2013, the licensee reduced power to 98 percent to complete the maintenance on the feedwater heater level control valve and returned the unit to essentially full power on September 8, 2013. Unit 1 operated at essentially full power for the remainder of the inspection period.

Unit 2 operated at essentially full power during the inspection period.

Unit 3 operated at essentially full power during the inspection period.

## **REPORT DETAILS**

## 1. **REACTOR SAFETY**

## Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### **1R01** Adverse Weather Protection (71111.01)

#### .1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On August 20, 2013, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for severe thunderstorms with potential for flash flooding during the monsoon season and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to monsoon season the licensee had corrected weather-related equipment deficiencies identified during the previous monsoon season.

The inspectors selected the following two risk-significant systems that were required to be protected from severe thunderstorms and flooding:

- Essential spray pond system
- Emergency diesel generator system

The inspectors reviewed the licensee's procedures and design information to ensure the systems would remain functional when challenged by adverse weather. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition of the adverse weather protection features.

These activities constituted one sample of readiness for seasonal adverse weather, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

## 1R04 Equipment Alignment (71111.04)

- .1 Partial Walkdown
  - a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- September 17, 2013, Unit 2, emergency diesel generator train A
- August 27, 2013, Unit 3, emergency diesel generator train B
- September 24, 2013, Unit 1, high pressure safety injection train B

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems were correctly aligned for the existing plant configuration.

These activities constituted three partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

#### .1R05 Fire Protection (71111.05)

- .1 <u>Quarterly Fire Inspection</u>
  - a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on the following four plant areas important to safety:

- July 18, 2013, Unit 2, emergency diesel generator building, all elevations
- August 27, 2013, Unit 3, control building, 74' elevation
- September 16, 2013, Unit 1, auxiliary building, 100' and 51' elevations

• September 24, 2013, Unit 3, high pressure safety injection train A and B pump rooms, 51' and 40' elevations

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

- .2 Annual Inspection
  - a. Inspection Scope

On July 31, 2013, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of an actual fire brigade response to a fire in the control building of Unit 3

During event, the inspectors evaluated the capability of the fire brigade members, the leadership ability of the brigade leader, the brigade's use of turnout gear and fire-fighting equipment, and the effectiveness of the fire brigade's team operation. The inspectors also reviewed whether the licensee's fire brigade met the NRC requirements for training, dedicated size and membership, and equipment.

These activities constituted one annual inspection sample, as defined in Inspection Procedure 71111.05

b. Findings

No findings were identified.

# 1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

## .1 Review of Licensed Operator Regualification

a. Inspection Scope

On September 24, 2013, the inspectors observed an evaluated simulator scenario performed by an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

#### .2 Quarterly Observation of Licensed Operator Performance

a. Inspection Scope

On July 2, 2013, the inspectors observed the performance of on-shift licensed operators in the Unit 1 main control room. At the time of the observations, Unit 1 was in a heightened activity following a reactor power cutback as a result of an electrical fault in a 13.8 kV load center. The inspectors observed the operators' performance in control room oversight and communications of the emergency action activity. In addition, the inspectors assessed the operators' adherence to plant abnormal operating procedures, including 40AO-9ZZ12, "Degraded Electrical Power," and other operations department policies.

These activities constitute completion of one quarterly licensed-operator performance samples, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

## 1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed one instance of degraded performance or condition of safetyrelated structures, systems, and components (SSCs):

• August 1-2, 2013, Unit 1, 2, and 3, essential spray pond structures

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of one maintenance effectiveness sample, as defined in Inspection Procedure 71111.12

#### b. Findings

No findings were identified.

#### 1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

#### a. Inspection Scope

On September 17-19, 2013, inspectors reviewed a risk assessment performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk for surveillance activities with an inoperable train B emergency diesel generator in Unit 3.

The inspectors verified that this risk assessment was performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

These activities constitute completion of one maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13

b. Findings

No findings were identified.

## 1R15 Operability Evaluations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed eight operability determinations that the licensee performed for degraded or nonconforming structures, systems, or components (SSCs):

- July 23, 2013, Unit 1, essential switchgear B essential air handling unit
- August 1, 2013, Unit 2, voltage spiking on essential 125 Vdc battery charger
- August 6, 2013, Unit 2, diesel fuel oil transfer piping below minimum wall thickness
- August 6, 2013, Unit 1, emergency diesel generator A air dryer to air receiver check valve
- August 16, 2013, Unit 1, 2, and 3, seismic qualification of 125Vdc breakers
- August 15, 2013, Unit 1, 2, and 3, cable separation criteria
- August 28, 2013, Unit 2 essential chill water circulating pump seal leakage

• September 18, 2013, Unit 3, emergency diesel generator A spurious alarms

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded SSC.

These activities constitute completion of eight operability and functionality review samples, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

## 1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed seven post-maintenance testing activities that affected risksignificant structures, systems, or components (SSCs):

- July 17, 2013, Unit 2, train B emergency diesel generator control room hand switch replacement
- July 19, 2013, Unit 1, containment spray A discharge valve bolting material replacement
- August 26, 2013, Unit 3, essential cooling water train A following planned maintenance
- August 26, 2013, Unit 3, essential chilled water train A following planned maintenance
- August 27, 2013, Unit 3, essential spray pond train A following planned maintenance
- August 30, 2013 Unit 3, emergency diesel generator train A following planned maintenance
- September 4, 2013, Unit 2, pool cooling pump A comprehensive test following lubrication

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests

in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of seven post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

#### 1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed six risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the structures, systems, and components (SSCs) were capable of performing their safety functions:

In-service tests:

- July 29, 2013, Unit 3, auxiliary feed water pump train A in-service test
- August 16, 2013, Unit 3, control element assembly operability check

Other surveillance tests:

- July 31, 2013, Unit 1, high pressure safety injection pump A time response testing
- September 12, 2013, Unit 2 and 3, station blackout generator load test
- September 17, 2013, Unit 3, remote shutdown disconnect switch and control circuit testing
- September 17, 2013, Unit 3, monthly surveillance emergency diesel generator

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the tests satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of six surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

#### b. Findings

No findings were identified.

#### **Cornerstone: Emergency Preparedness**

## 1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

#### a. Inspection Scope

The inspectors performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures (EPIPs) and the Emergency Plan located under ADAMS accession number ML13217A003 as listed in the Attachment.

The licensee determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.04-06.

b. Findings

No findings were identified.

## 1EP6 Drill Evaluation (71114.06)

Training Evolution Observation

a. Inspection Scope

On September 24, 2013, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of one training observation sample, as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

# 4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

## 4OA1 Performance Indicator Verification (71151)

## .1 Reactor Coolant System Specific Activity (BI01)

## a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of third quarter 2012 through the second quarter 2013 to verify the accuracy and completeness of the reported data. The inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample on September 17, 2013. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system specific activity performance indicator for Units 1, 2, and 3, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

## .2 Reactor Coolant System Identified Leakage (BI02)

a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system identified leakage for the period of third quarter 2012 through the second quarter 2013 to verify the accuracy and completeness of the reported data. The inspectors observed the performance of 40ST-9RC02, "ERFDADS Calculation for RCS Water Inventory," Revision 53 on September 17, 2013. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system leakage performance indicator for Units 1, 2, and 3, as defined in Inspection Procedure 71151.

## b. Findings

No findings were identified.

# 4OA2 Problem Identification and Resolution (71152)

## .1 Routine Review

#### a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

#### .2 Annual Follow-up of Selected Issues

a. Inspection Scope

For an in-depth follow-up, the inspectors selected a discrepancy that the licensee identified on April 9, 2013, between the seismic monitor alarm set point and the Emergency Plan threshold for declaring a seismic event. The inspectors assessed the licensee's problem-identification threshold, cause analyses, extent-of-condition reviews, and compensatory actions. The inspectors verified that the licensee appropriately prioritized the corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of one annual follow-up sample, as defined in Inspection Procedure 71152.

b. Findings

## Failure to Maintain an Effective Emergency Plan for a Seismic Event

Introduction. The inspectors identified a Green non-cited violation of 10 CFR 50.54 (q)(2) for the failure to maintain an effective emergency plan action level scheme in accordance with 50.47(b)(4). Specifically, the Alert threshold for HA1.1, "Natural or Destructive Phenomena Affecting VITAL AREAS," requires a declaration of an Alert for a seismic event greater than operating basis earthquake (OBE) as indicated by any force balance accelerometer reading greater than 0.10g. Operators rely on alarms to verify the ground acceleration beyond the OBE and the inspectors determined the seismic monitor alarm set point was 0.13g. This could result with the inability of operations personnel to classify an event at the Alert level. The licensee entered the issue into their corrective action program as PVAR 3624077.

<u>Description</u>. In September of 2009, Palo Verde received approval to modify their existing emergency plan to incorporate the guidance of NEI 99-01, "Methodology for Development of Emergency Action Levels," Rev. 5. This established the Alert threshold for Emergency Action Level HA1.1, "Natural or Destructive Phenomena Affecting VITAL AREAS," to require a declaration of an Alert for a seismic event greater than OBE as indicated by any force balance accelerometer reading greater than 0.10g. Prior to this change, the classification of an Alert for exceeding the OBE had been at an acceleration level of 0.13g. Seismic instrumentation was set up to alarm and inform operations personnel for exceeding this threshold of 0.13g. The licensee failed to recognize that the seismic instrumentation alarm set point exceeded the newly established threshold.

The inspectors determined the licensee had failed to complete corrective actions initiated after identifying the ineffective threshold in 2011. On February 25, 2011, plant personnel identified the discrepancy with the Emergency Action Level (EAL) threshold that was changed from 0.13g to 0.1g when the licensee incorporated NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 5 in September 2009. In Condition Report Disposition Request (CRDR) 3630752, the licensee documented the subsequent evaluation that concluded that they needed a license amendment to change the EAL for a seismic event. The licensee initiated Condition Report Action Item 3718200 to complete a 10CFR50.54 (g) evaluation and submit a license amendment request. No corrective action was completed from the licensee's evaluation. The inspectors determined the licensee had failed to thoroughly evaluate the ineffective emergency action level when identified, had failed to implement a design change to correct the set point issue, and had allowed an ineffective emergency action level scheme to remain in effect for more than a year after being identified. Subsequently, on March 1, 2012, in Condition Report Action Item 4057837, the licensee documented another evaluation that concluded the current EAL threshold was adequate, and cancelled the action to submit a license amendment request. Under engineering work request 4325700, a design change modified the seismic monitoring set point to 0.1g and restored compliance.

<u>Analysis</u>. The failure to maintain an effective emergency action level scheme was a performance deficiency. The performance deficiency was more than minor, and therefore is a finding, because it adversely affected the Emergency Response Organization Performance attribute of the Emergency Preparedness Cornerstone and its objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee's ability to declare an Alert based on natural phenomenon at the correct threshold was degraded. The inspectors assessed the significance of the finding in accordance with the NRC Inspection Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Figure 5.4-1, and determined the finding to be of very low safety significance because Compensatory measures were available for emergency response organization personnel to perform the classification duties. The inspectors determined the cause of this finding is not indicative of current performance and therefore no cross-cutting aspect is assigned.

<u>Enforcement</u>. Title 10 CFR Part 50.54(q)(2) requires that a holder of a nuclear power reactor operating license shall follow and maintain in effect emergency plans which meet

the standards in 10 CFR 50.47(b), and the requirements in 10 CFR Part 50 Appendix E. 10 CFR 50.47(b)(4) requires, in part, that a licensee follow a standard emergency action level scheme. Contrary to the above, from September 2009 to March 29, 2013, the licensee failed to maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b). Specifically, Alert threshold for Emergency Action Level HA1.1, "Natural or Destructive Phenomena Affecting VITAL AREAS," requires a declaration of an Alert for a seismic event greater than OBE as indicated by any force balance accelerometer reading greater than 0.10g, and the seismic monitoring system would not have alerted operators when this threshold was exceeded. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as PVAR 3624077, this violation is being treated as a non-cited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000528/529/530/2013004-01, "Failure to Maintain an Effective Emergency Plan for a Seismic Event."

## 4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

a. <u>Inspection Scope</u>

The inspectors reviewed the below listed events for plant status and mitigating actions to: (1) provide input in determining the appropriate agency response in accordance with Management Directive 8.3, "NRC Incident Investigation Program," (2) evaluate performance of mitigating systems and licensee actions; and (3) confirm that the licensee properly classified the event in accordance with emergency action level procedures and made timely notifications to NRC and state/governments, as required.

- July 2, 2013, Unit 1, declaration of Unusual Event due to explosion within the protected area and reactor power cutback following electrical fault in non-class load center NGN-L02
- September 2-3, 2013, Unit 2, declaration of Unusual Event due to fire in the turbine building

These activities constitute completion of two event follow-up samples, as defined in Inspection Procedure 71153.

b. Findings

## Failure to Include Inspection Requirements in Preventative Maintenance Basis

<u>Introduction</u>. The inspectors identified a Green finding for the failure of licensee personnel to follow Procedure 30DP-9MP08, "Preventive Maintenance Program." Specifically, plant personnel did not ensure that requirements for performing inspection and replacement of degraded tie-wraps in electrical cubicles were contained in preventative maintenance basis documents, resulting in a catastrophic electrical fault in the load center L02 and a reactor power cutback. The licensee has entered this issue into their corrective action program as PVAR 4454845.

<u>Description</u>. On July 2, 2013, while operating at full power, the Unit 1 experienced a sudden loss of load centers NGN-L02, L06, and L16 due to an electrical fault in the L02 electrical cubicle. This resulted in the loss of a main feedwater pump and a reactor power cutback to approximately 60 percent power. Due to the nature of the catastrophic failure of load center L02, the licensee declared a Notice of Unusual Event, which they terminated approximately three hours later. The licensee initiated CRDR 4430704 to investigate the cause of the event. The licensee determined the direct cause of the event was the failure of plastic cable tie-wraps, which allowed a cable shield wire for load center L02 to contact the exposed 13.8 kV bus in the cubicle, initiating a ground fault. The licensee took immediate corrective actions to rebuild the L02 load center electrical cubicle in a configuration such that if the shield wire were to come loose it could not come in contact with the energized electrical bus.

The licensee had previously experienced similar degraded cable tie-wrap failures. In August 2009, during an electrical cabinet clean and inspect preventive maintenance activity, several cable tie-wraps were found to be cracked and broken. Condition report disposition request 3354476 evaluated these failures and recommended that specific work steps be added to the inspection and cleaning procedures to ensure that all degraded tie-wraps that have the potential to cause electrical component failures are found and replaced during preventive maintenance activities.

Procedure 30DP-9MP08, "Preventive Maintenance Program," Revision 19, describes the licensee's program for optimizing the reliability of plant equipment. Appendix A lists information sources which should be consulted when determining necessary preventive maintenance activities and providing activity justifications. Among the information sources are CRDRs and PVARs which should be reviewed for a history of previous failures and actions taken for resolution. Furthermore, procedure 30DP-9MP08 also states that the preventive maintenance basis should contain reference to these resources when requirements or recommendations are applicable to equipment. The preventive maintenance basis is the collection of pertinent information from various sources that justifies and identifies the activities needed to optimize the reliability of plant equipment.

In May 2010, following the 2009 CRDR evaluation, the licensee completed updates to all active inspection and cleaning procedures to include the additional focus on degraded tie-wraps. However, the licensee did not update the preventative maintenance basis to reflect this operating experience. Then, in August 2010, the licensee changed the electrical cubicle inspection frequency from once every two refueling outages to once every four refueling outages. The preventive maintenance basis documents were consulted, but the documents contained no information regarding the recent tie-wrap failures that had been discovered during previous electrical cubicle inspections. Load center L02, which suffered the electrical fault on July 2, 2013, was not inspected in 2011 as originally scheduled. Under the less frequent inspection schedule, the load center was not due for its cleaning and inspection preventive maintenance until the fall of 2014.

The licensee captured this issue in their corrective action program as PVAR 4454845. The licensee is currently evaluating the addition of references to the preventive maintenance basis documents associated with degraded cable tie-wraps to enable appropriate consideration when evaluating future proposed changes to maintenance requirements.

Analysis. The failure to follow established procedures for updating preventive maintenance basis documents with requirements and recommendations from previous component failures was a performance deficiency. This performance deficiency is more than minor, and therefore is a finding, because it was associated with the procedure quality attribute of the Initiating Events Cornerstone and adversely affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, by not including the requirements and recommendations from the history of previous failures in the preventive maintenance basis, the licensee did not consider pertinent operating experience when evaluating changes to the preventive maintenance program. Consequently, the licensee did not inspect degraded cable tie-wraps in Unit 1 load center L02, resulting in a catastrophic electrical fault on July 2, 2013 that upset plant stability. The inspectors used the NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," to determine the significance. The inspectors determined that the finding was of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors also determined the issue had a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience component because the licensee did not implement and institutionalize operating experience through changes to the station's preventive maintenance program [P.2(b)].

<u>Enforcement</u>. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. Specifically, the non-class load center and motor control center power system does not perform a safety-related function. Because this finding does not involve a violation of a regulatory requirement and has very low safety significance, it is identified as a finding: FIN 05000528/529/530/2013004-02, "Failure to Include Inspection Requirements in Preventative Maintenance Basis."

## 40A6 Meetings, Including Exit

## Exit Meeting Summary

On October 3, 2013, the inspectors presented the inspection results to D. Mims, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

# SUPPLEMENTAL INFORMATION

## **KEY POINTS OF CONTACT**

#### Licensee Personnel

A. Bassett, Engineer, System Engineering

- A. Krainik, Department Leader Nuclear Engineering, Operations
- B. Berryman, Plant Manager, Plant Operations
- C. Moeller, Manager, Radiation Protection
- C. Tubman, Section Leader, Radiation Protection Operations
- D. Arbuckle, Manager, Operations
- D. Hansen, Senior Consultant Engineer
- D. Jennings, Supervisor, Radiation Protection
- D. Mims, Senior Vice President, Regulatory and Oversight
- D. Van Allen, Engineer, Engineering Inspections
- D. Wheeler, Department Leader, Performance Improvement
- E. Dutton, Director, Nuclear Assurance Department
- E. Fernandez, Senior Engineer
- E. Kirkland, Program Advisor, Maintenance
- F. Oreshack, Consultant, Regulatory Affairs
- F. Puleo, Peer Evaluator, STARS/South Texas Project
- G. Andrews, Manager, Operations Support
- G. Jones, Team Leader, Radiation Protection
- J. Bettencourt, Technical Advisor, Radiation Protection
- J. Bungard, Supervisor, Radiological Engineering
- J. Cadogan, Vice President, Nuclear Engineering
- J. Cox, Engineer, Program Engineering
- J. McDonnell, Department Leader, Radiation Protection
- K. Foster, Department Leader, Fire Department
- K. House, Director, Nuclear Design Engineering
- K. Schrecker, Section Leader, Engineering Programs
- M. Brannin, Senior Engineer, Program Engineering
- M. Debolt, Team Leader, Nuclear Maintenance
- M. Lacal, Vice President, Operations Support
- M. McGhee, Manager, Regulatory Affairs
- M. McLaughlin, Director, Technical Services
- M. Radspinner, Department Leader, System Engineering
- M. Ray, Director, Emergency Preparedness/Security
- M. Shea, Director, Safety Culture
- N. Aaronscooke, Engineer, Regulatory Affairs
- N. Nelson, Senior Technician, Radiation Protection
- P. Anderson, Engineer, Program Engineering
- P. McSpaman, Director, Nuclear Training
- R. Barnes, Director, Regulatory Affairs
- R. Bement, Senior Vice President, Site Operations
- R. Bethke, Department Leader, Emergency Preparedness
- R. Folley, Engineer, Engineer Inspections

- R. Routolo, Operations Department Leader, Radiation Services
- R. Sims, Instrumentation Technician, Radiation Protection
- R. Witzak, Operations Superintendant, Radiation Protection
- S. Lantz, Section Leader, Radiation Protection Technical Services
- S. Pobst, Section Leader, Engineering
- T. Gray, Department Leader, Radiation Protection
- T. Mitchell, Component Engineer, Engineering
- T. Mock, Director, Operations

Opened and Closed

- T. Weber, Department Leader, Regulatory Affairs
- W. Blaxton, Radiation Monitoring Technician, Radiation Protection
- W. Leaverton, Engineer, System Engineering

#### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

05000528/529/530/2013004-01	NCV	Failure to Maintain an Effective Emergency Plan for a Seismic Event (Section 4OA2)
05000528/529/530/2013004-02	FIN	Failure to Include Inspection Requirements in Preventative Maintenance Basis (Section 40A3)

## LIST OF DOCUMENTS REVIEWED

#### Section 1R01: Adverse Weather Protection

PROCEDURE
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<u>NUMBER</u>		TITLE	REVISION
40AP-9ZZ21	Acts of Nature		27
Section 1R04: E	quipment Alignment		
PROCEDURES			

<u>NUMBER</u>	TITLE	<u>REVISION</u>
40ST-9SI07	High Pressure Safety Injection System Alignment Verification	16
400P-9DG02	Emergency Diesel Generator Train B	66
400P-9DF02	Diesel Fuel Oil Storage and Transfer	41

#### PALO VERDE ACTION REQUESTS

#### 3676132 4361544

# Section 1R05: Fire Protection

PROCEDURES				
<u>NUMBER</u>		<u>TITLE</u>		REVISION
14DP-0FP02	Fire Impairments a	and Notifications		20
40DP-9ZZ17	Control of Doors, H	Hatches, and Floor	Plugs	53
PALO VERDE AC	TION REQUESTS			
4303572	4324978	4413218	4413227	4413541
4415017	4418697	4440947	4440943	4440948
4439944	4439835	4439946		
WORKORDERS				
4312075	4262024	4325948		
MISCELLANOUS	DOCUMENTS			
<u>NUMBER</u>		TITLE		<u>REVISION /</u> <u>DATE</u>
	Pre-Fire Strategies	s Manual		23
	Pre-Fire Strategies	s Manual		24
	UFSAR, Section 9	.5.1, Fire Protection	n System	17
	Fire Watch Logs			July 30, 2013
Ocation (D44)	in a model of the motern r	Degualification Dra		

# Section 1R11: Licensed Operator Requalification Program

# PROCEDURES

<u>NUMBER</u>	TITLE	<u>REVISION</u>
40DP-90P02	Conduct of Shift Operations	58
40AO-9ZZ09	Reactor Power Cutback	25
41AL-1RK1B	Panel B01B Alarm Response	42

# **CONDITION REPORTS / DISPOSTION REPORTS**

4430704 443016

# MISCELLANOUS DOCUMENT

NUMBER	TITLE	DATE
	Scenario for Simulator Session	September 24, 2013
	laintenance Effectiveness	
PROCEDURES		
	<u>TITLE</u>	<u>REVISION</u>
70DP-0MR01	Maintenance Rule	34
81DP-0ZZ01	Civil System, Structure, and Component Monitoring Program	22
PALO VERDE AC	TION REQUEST	
4446642		
CONDITION REP	ORTS / DISPOSITION REPORT	
3449979		
CACULATION		
<u>NUMBER</u>	TITLE	<b>REVISION</b>
02-CC-SP-0044	Condition Assessment of Essential Spray Pond Concrete Enclosure Walls	0
MAINTENANCE [	DOCUMENTS	
4421739	4421740	
MISCELLANOUS	DOCUMENT	
NUMBER	TITLE	DATE
IN 2011-20	Concrete Degradation by Akali-Silica Reaction	November 18, 2011
Section 1R13: M	laintenance Risk Assessment and Emergent Work Controls	
PROCEDURES		
<u>NUMBER</u>	TITLE	REVISION
43ST-3ZZ02	Inoperable Power Sources Action Statement	39

# Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

NUMBER	TITLE	<u>REVISION</u>
40DP-9RS01	Online Nuclear Risk Management Modes 1 and 2	1
70DP-0RA05	Assessment and Management of Risk when Performing Maintenance in Mode 1 and 2	19
43ST-3ZZ02	Inoperable Power Sources Action Statement	39

# PALO VERDE ACTION REQUEST

4453785

# **CONDITION REPORTS / DISPOSITION REPORTS**

3237141 3227660

# Section 1R15: Operability Evaluations

#### PROCEDURES

<u>NUMBER</u>		TITLE		<b>REVISION</b>
40DP-90P26	-	Processing and Op ctional Assessment	•	35
40ST-9EC03	Essential Chilled V Action Surveillance		Systems Inoperable	17
73ST-9DF01	Diesel Fuel Oil Tra	nsfer Pumps- In-se	rvice Test	27
PALO VERDE AC	TION REQUESTS			
4441517	4451430	4445246	4445593	4436201
4434207	3221258	4449937	4449901	4303572
4451824	4021134	3447220	4450200	4448173
4433533	4423650	4440399		
CONDITION REP	ORTS / DISPOSTIC	ON REQUESTS		
4034185	9-5-Q633			
WORK ORDERS				
35484682	4151373	3364557	3925945	4425505
4426424	3886320	4124270		

# **CACULATIONS**

<u>NUMBER</u>	TITLE	<b>REVISION</b>
13-JC-DG-0203	Emergency Diesel Generator (DG) and Diesel Fuel Oil (DF) Systems Instrumentation Uncertainty Calculation	9
13-ES-A041	RG 1.75 Low Energy Circuit Analysis	0
13-MC-EC-0200	EC System Hydraulic Calculation	7
MISCELLANEOU	<u>S DOCUMENTS</u> <u>TITLE</u> Clearance 347326 Work Scope Library 3685092	<u>REVISION</u>
DBM-E2	Electrical Topical Desing Basis Manual	15
40DP-90PA4	Area 4 Operator Logs, Modes 1-4	107

# Section 1R19: Post-Maintenance Testing

# PROCEDURES

<u>NUMBER</u>	TITLE	<b>REVISION</b>
73ST-9SI06	Containment Spray Pumps and Check Valves – Inservice Test	36C
73ST-9PC02	Fuel Pool Cooling Pumps – Comprehensive Pump Test	6
400P-9PC01	Fuel Pool Cooling	12
40ST-9DG02	Diesel Generator Testing	47
40ST-9DG01	Diesel Generator A Test	43
40ST-9DF01	Fuel Oil Day Tank Accumulated Water Check	8
73ST-9SP01	Essential Spray Pond Pumps- In-service Test	40
73ST-9EW02	Essential Cooling Water Pumps- Comprehensive Pump Test	3
73ST-9EC02	Essential Chilled Water Pumps- Comprehensive Pump Test	4

# PALO VERDE ACTION REQUESTS

4454608 4200903

#### WORK ORDERS

3572577	4186298	4043785	3791384	4411934
4045302	4426702	4358433	4070360	4070423
4070433	4070434	4070376		

## MISCELLANEOUS DOCUMENT

<u>NUMBER</u>	TITLE	DATE
73ST-PC02	Fuel Pool Cooling Pumps – Comprehensive Pump Test Operations Tailboard	September 4, 2013
2MPCAP01	PUMPXX – "A" Fuel Pool Cooling Pump (172681) Operations Technical Document TD#173741	

# Section 1R22: Surveillance Testing

## PROCEDURES

<u>NUMBER</u>	TITLE	<b>REVISION</b>
40ST-9ZZ25	Remote Shutdown Disconnect Switch and Control Circuit Operability	4
40ST-9GT08	Station Blackout Generator Isochronous Test	6
40ST-9DG02	Diesel Generator Test	47
40ST-9ZZ25	Remote Shutdown Disconnect Switch and Control Circuit Operability	4
73ST-9SI10	HPSI Pumps Miniflow – Inservice Test	48

## PALO VERDE ACTION REQUEST

#### WORK ORDERS

348269	4161245	4421469	4070361	4045302
4045138	4262024	4020846	4034285	4043183

# MISCELLANOUS DOCUMENT

NUMBER
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<u>TITLE</u>

REVISION / DATE

TSCCR 4456379

# Section 1EP4: Emergency Action Level and Emergency Plan Changes <u>PROCEDURE</u>

<u>NUMBER</u>	TITLE	<b>REVISION</b>
	Emergency Plan	50
Section 1EP6: D	Neill Evolution	
MISCELLANOUS		
<u>NUMBER</u>	TITLE	<u>REVISION /</u> DATE
	PVNGS Emergency Plan	50
Section 4OA1: F	Performance Indicator Verification	
PROCEDURES		
<u>NUMBER</u>	TITLE	<u>REVISION</u>
74DP-0LC01	RCS Activity Performance Indicator	6
74OP-9SS01	Primary Sampling Instructions	37
74ST-9RC02	RCS Specific Activity Surveillance Test	14
40ST-9RC02	ERFDADS (Preferred) Calculation of RCS Water Inventory	53
74CH-9ZZ15	RCS Gross Activity and Dose Equivalent I-131 Determination	5
PALO VERDE AC	CTIO REQUESTS	
4452659	4412048	
<u>STWOS</u>		
4049860	4043356	
MISCELLANEOU	IS DOCUMENT	
NUMBER	TITLE	<u>REVISION</u>
NEI 99-02	Regulatory Assessment Performance Guideline	6
Section 4OA2: Identification and Resolution of Problems		

PROCEDURE			
<u>NUMBER</u>	TITLE REVISION		
79IS-9SM01	Analysis of Seismic Event 23		
PALO VERDE AC	TION REQUESTS		
4373411	3624077 4044830		
CONDITION REP	PORTS / DISPOSTION REPORTS		
4048555	3630752 4057837		
CONDITION REP	PORT ACTION ITEM		
4057837			
MISCELLANEOU	<u>S DOCUMENTS</u>		
<u>NUMBER</u>	TITLE	DATE	
EER 86-XM-012		March 27, 1986	
LDCR 2011-F040		September 14, 2011	
LDCR 2012-F011		April 10, 2012	
	Revision of Emergency Action Level HA1.1 June 30, 2011		
Section 4OA3: E	Event Follow-Up		
PROCEDURES			
<u>NUMBER</u>	TITLE	<u>REVISION</u>	
40AO-9ZZ09	Reactor Power Cutback (Loss of Feed water Pump) Revision	25	
14DP-0FP32	Emergency Notification and Response	34	
30DP-9MP08	Preventive Maintenance Program	19	

# PALO VERDE ACTION REQUESTS

4452094	4451729	4453676	4453588	4451740
4454768	4451732	4454845		

# **CONDITION REPORTS / DISPOSTION REPORTS**

4430704 3354476

# MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>

# <u>TITLE</u>

<u>DATE</u>

EN# 49169	Reactor Plant Event Notification
EN# 49317	Reactor Plant Event Notification

July 3, 2013 September 2, 2013