



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 E. LAMAR BLVD.  
ARLINGTON, TX 76011-4511

May 13, 2015

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 05000528/2015001, 05000529/2015001, AND 05000530/2015001

Dear Mr. Edington:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Palo Verde Nuclear Generating Station Units 1, 2, and 3. The NRC inspectors discussed the results of this inspection on April 2, 2015, with Mr. R. Bement and other members of your staff, and again on May 8, 2015, with Mr. D. Mims and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

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 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 <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Geoffrey B. Miller, 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 05000528/2015001,  
05000529/2015001, and 05000530/2015001  
w/ Attachment: Supplemental  
Information

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Letter to Randall K. Edington from Geoffrey B. Miller dated May 13, 2015

SUBJECT: Palo Verde Nuclear Generating Station – NRC INTEGRATED INSPECTION  
REPORT 05000528/2015001, 05000529/2015001, AND 05000530/2015001

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000528, 05000529, 05000530

License: NPF-41, NPF-51, NPF-74

Report: 05000528/2015001, 05000529/2015001, 05000530/2015001

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station

Location: 5801 South Wintersburg Road  
Tonopah, Arizona 85354

Dates: January 1 through March 31, 2015

Inspectors: C. Peabody, Senior Resident Inspector  
D. Reinert, Resident Inspector  
D. You, Resident Inspector  
L. Brandt, Project Engineer  
C. Steely, Operations Engineer  
M. Hayes, Operations Engineer  
G. Guerra, Emergency Preparedness Inspector

Approved By: Geoffrey B. Miller  
Chief, Project Branch D  
Division of Reactor Projects

## SUMMARY

IR 05000528, 529, 530/2015001; 1/1/2015 – 3/31/2015; Palo Verde Nuclear Generating Station Units 1, 2, and 3, integrated inspection report, post-maintenance testing.

The inspection activities described in this report were performed between January 1, 2015 and March 31, 2015, by the resident inspectors at Palo Verde Nuclear Generating Station and inspectors from the NRC's Region IV office. One finding of very low safety significance (Green) are documented in this report. This finding involved a violation of 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, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green, non-cited violation of Palo Verde Technical Specification 5.5.8 "Inservice Testing Program" which requires the in-service testing of ASME Code Class 1, 2, and 3 components in accordance with the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2001 Edition with Addenda through 2003. On April 26, 2013, the licensee did not test Unit 1 train A shutdown cooling isolation valve SIA-UV-651, an ASME Code Class 1 valve, in accordance with ASME OM Code Section ISTC-3310. The licensee entered this issue into the corrective action program as Palo Verde Action Request 4398843.

The failure to complete ASME OM Code required in-service testing on a Class 1 motor operated valve is a performance deficiency. This performance deficiency is more than minor, and therefore is a finding, because it affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Specifically, by not performing the required testing, the licensee did not maintain the requisite level of assurance of the equipment's capability of performing its intended function. Using Inspection Manual Chapter 0609 Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the condition was not a design or qualification deficiency, did not involve an actual loss of safety function for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. Because the most-significant contributor to the finding was that Individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained, the finding has a cross-cutting aspect in the Human Performance area and the aspect of Teamwork (H.4). (Section 1R19)

### Licensee-Identified Violations

None

## PLANT STATUS

Unit 1 operated at effective full power for the entire inspection period.

Unit 2 operated at effective full power for the entire inspection period with the exception of a five percent down-power during a loss of all charging and letdown event as directed by station abnormal operating procedures on March 20, 2015.

Unit 3 operated at effective full power for the entire inspection period.

## REPORT DETAILS

### 1. REACTOR SAFETY

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

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

##### Readiness to Cope with External Flooding

##### a. Inspection Scope

On March 2, the inspectors completed an inspection of the station's readiness to cope with external flooding. After reviewing the licensee's flooding analysis, the inspectors chose plant areas that were susceptible to flooding:

- March 2, Unit 3 auxiliary building 51', 70', 88', and 100' elevations

The inspectors reviewed plant design features and licensee procedures for coping with flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether credited operator actions could be successfully accomplished.

These activities constituted one sample of readiness to cope with external flooding, as defined in Inspection Procedure 71111.01.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment (71111.04)

##### Partial Walkdown

##### a. Inspection Scope

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

- February 19, Unit 2 "A" auxiliary feedwater system
- February 26, Unit 3 "B" auxiliary feedwater system

- March 19, Unit 2 “A” channel 120Vac class 1E instrument power

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 trains 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)**

Quarterly Inspection

a. Inspection Scope

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

- January 23, Unit 1, auxiliary feedwater rooms, fire zones 72 and 73
- March 3, Unit 1, west & east piping penetration rooms, fire zones 37C and 37D
- March 20, Unit 2, auxiliary feedwater rooms, fire zones 72 and 73
- March 24, Unit 3, diesel generator building, fire zones 23A and 23B

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.

**1R06 Flood Protection Measures (71111.06)**

a. Inspection Scope

On February 23, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected two underground vaults that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:

- February 18, Unit 3 “B” diesel generator fuel oil vault



- February 23, Unit 3 “A” diesel generator fuel oil vault

The inspectors observed the material condition of the cables and splices contained in the vaults and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constitute completion of one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

**1R07 Heat Sink Performance (71111.07)**

a. Inspection Scope

On March 16, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors observed the licensee’s inspection of the Unit 3 “A” Emergency Diesel Generator lube oil and jacket water heat exchangers and the material condition of the heat exchanger internals.

These activities constitute completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

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

The licensed operator requalification program involves two training cycles that are conducted over a 2-year period. In the first cycle, the annual cycle, the operators are administered an operating test consisting of job performance measures and simulator scenarios. In the second part of the training cycle, the biennial cycle, operators are administered an operating test and a comprehensive written examination. This feeder is a continuation of the requalification program inspection that was documented in NRC Inspection Report 2014005. This continuation was necessary due to the timing of the facility exams at the end of the calendar year.

**.1 Review of Licensed Operator Requalification**

a. Inspection Scope

On March 24, 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 Review of Licensed Operator Performance

a. Inspection Scope

On March 5, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to performance of the "A" essential spray pond pump inservice testing using revised procedures.

In addition, the inspectors assessed the operators' adherence to plant procedures, including Conduct of Shift Operations procedure and other operations department policies.

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

b. Findings

No findings were identified.

.3 Biennial Inspection

a. Inspection Scope

To assess the performance effectiveness of the licensed operator requalification program, the inspectors conducted personnel interviews, reviewed both the operating tests and written examinations, and observed ongoing operating test activities.

The inspectors interviewed five licensee personnel, consisting of three operators and two instructors, to determine their understanding of the policies and practices for administering requalification examinations. The inspectors also reviewed operator performance on the written exams and operating tests. These reviews included observations of portions of the operating tests by the inspectors. The operating tests observations included nine job performance measures and four scenarios that were used in the current biennial requalification cycle. These observations allowed the inspectors to assess the licensee's effectiveness in conducting the operating test to ensure operator mastery of the training program content. The inspectors also reviewed medical records of twelve licensed operators for conformance to license conditions and the licensee's system for tracking qualifications and records of license reactivation for four operators.

The results of these examinations were reviewed to determine the effectiveness of the licensee's appraisal of operator performance and to determine if feedback of performance analyses into the requalification training program was being accomplished. The inspectors interviewed members of the training department and reviewed minutes of training review group meetings to assess the responsiveness of the licensed operator requalification program to incorporate the lessons learned from both plant and industry

events. Examination results were also assessed to determine if they were consistent with the guidance contained in NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process."

In addition to the above, the inspectors reviewed examination security measures, simulator fidelity, and existing logs of simulator deficiencies.

Upon completion of the exam process the licensee informed the lead inspector of the results of the written examinations and operating tests for the Licensed Operator Requalification Program. The inspectors compared these results to the Appendix I, "Licensed Operator Requalification Significance Determination Process," values and determined that there were no findings based on these results and because all of the individuals that failed the applicable portions of their exams and/or operating tests were remediated, retested, and passed their retake exams prior to returning to shift.

The inspectors completed one inspection sample of the biennial licensed operator requalification program.

b. Findings

A licensee-identified finding was documented in NRC Inspection Report 05000528; -529; -530/2014005.

**1R12 Maintenance Effectiveness**

a. Inspection Scope

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

- March 5, auxiliary building and main steam support structure floor drains, recent system failures pertaining to drain line blockages and check valve failures

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**

The inspectors reviewed two risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- March 5 Unit 3, “A” essential spray pond pump inservice testing
- March 16, Unit 3, “B” diesel generator and essential spray pond systems maintenance outage

The inspectors verified that these risk assessments were 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.

The inspectors also observed portions of one emergent work activity that had the potential to cause an initiating event or to affect the functional capability of mitigating systems:

- March 20, Unit 2, “A” and “E” charging pump failures with “B” charging pump functional but degraded due to discharge pulsation dampener failure

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected structures, systems, and components (SSCs).

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

### **b. Findings**

No findings were identified.

## **1R15 Operability Determinations and Functionality Assessments (71111.15)**

### **a. Inspection Scope**

The inspectors reviewed four operability determinations and one functionality assessment that the licensee performed for degraded or nonconforming structures, systems, or components (SSCs):

- January 2, operability determination of Unit 2 reactor vessel head inner seal o-ring pressure indicator
- January 27, operability determination of Unit 2 “B” diesel generator jacket water heat exchange corrosion
- January 27, operability determination of Unit 3 “A” diesel generator lube oil heat exchange corrosion

- February 19, functionality assessment of Unit 3 “A” auxiliary feedwater pump room high water level switch
- March 24, operability determination of Unit 1 shutdown cooling isolation valve SIA-UV-651

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

These activities constitute completion of five 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 six post-maintenance testing activities that affected risk-significant structures, systems, or components (SSCs):

- January 27, Unit 3 “A” auxiliary feedwater pump steam supply valve maintenance
- February 27, Unit 3 “C” battery charger test following scheduled preventive maintenance
- February 28, Unit 3 “A” diesel generator test following scheduled maintenance
- March 3, Unit 2 “A” auxiliary feedwater steam supply bypass valve torque switch replacement
- March 18, Unit 1 “A” auxiliary feedwater pump flow instrument calibration
- March 23, Unit 1, shutdown cooling isolation valve SIA-UV-651 following outage maintenance (final disposition of a previous quarter’s sample)

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 five post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of Palo Verde Technical Specification 5.5.8 “Inservice Testing Program” which requires in-service testing of ASME Code Class 1, 2, and 3 components in accordance with the ASME Code

for Operation and Maintenance of Nuclear Power Plants (OM Code) 2001 Edition with Addenda through 2003. On April 26, 2013, the licensee did not test Unit 1 train A shutdown cooling isolation valve SIA-UV-651, an ASME Code Class 1 valve, in accordance with ASME OM Code Section ISTC-3310.

Description. During Unit 1 refueling outage 1R17, the licensee performed maintenance on motor-operated valve SIA-UV-651 to correct seat leakage and to refurbish the actuator. Valve SIA-UV-651 has safety-related functions in both its closed and opened positions. In its closed position, valve SIA-UV-651 is the first pressure boundary between the reactor coolant system and the shutdown cooling system. The valve is also called upon in the licensee's emergency operating procedures to remotely open when repositioned by control room operators establishing long term cooling following a loss of coolant accident.

The licensee's motor-operated valve program implements the requirements of the ASME Operations and Maintenance Code. The licensee committed to the requirements of the 2001 ASME OM Code edition with 2003 Addenda. Code section ISTC-3310 requires that following any maintenance which could affect the performance of the valve, the valve must be stroke-time tested to either verify that the reference value was still valid, or set a new reference value.

Following the work on SIA-UV-651, the prescribed post-maintenance retests to be performed included a seat leakage check and a functional timed stroke. On April 25, 2013, when Unit 1 was in Hot Standby mode at the end of the refueling outage, the licensee conducted seat-leakage testing on SIA-UV-651. During the first test attempt, leakage past the valve exceeded the Technical Specification limit of 5 gpm. The licensee entered LCO 3.4.15 due to excessive leakage and initiated troubleshooting work order 4397107 to correct the condition. Maintenance activities performed on valve SIA-UV-651 during troubleshooting included lifting and re-landing electrical lead wires, adjusting motor operator torque switch settings, and de-coupling and manually manipulating the valve actuator. On April 26, 2013, the valve seat leakage requirements of Technical Specification 3.4.15 were met and the licensee left the valve closed, in the position that it was in when it passed the seat-leakage test.

Troubleshooting work order 4397107 included instructions to perform a post-maintenance test and an as-left functional timed valve stroke following the seat leakage test. However, the licensee did not perform either this test or the timed stroke. Instead, a valve services technician lined out the procedure step and noted at the bottom of the work order page that the functional stroke was not performed per direction from the Operations department.

Procedure 30DP-9WP02, "Maintenance Work Order Process and Control," Revision 63, Appendix B describes the work order change process. This procedure describes a change to a retest as a "method change," and states that if the work order originally required a technical approval, the changes to a method also require the performance of a technical approval. In this instance, the operations personnel who directed the valve services technician to line out the valve-stroke procedure steps did not recognize the importance of the retest requirement and did not request a technical approval to assess the deletion of those steps. The inspectors determined that had a technical review been performed, that the ASME OM Code requirements likely would have been identified as not met and corrected.

The inspectors also identified a second missed opportunity to recognize and address the missed retest requirement. After the licensee noted that they had failed to complete the functional test of the valve, a licensee engineer initiated PVAR 4398843, titled "MOV Program Violations." This PVAR described how the lack of a post maintenance retest violated the licensee's motor operated valve program. Operators performed an immediate operability determination (IOD) for this condition, as required by procedure 40DP-9OP26, "Operations PVAR Processing and Operability Determination/Functional Assessment," Revision 34. That IOD offered justification that the valve remained operable because it had been electrically cycled several times as part of maintenance and troubleshooting activities during the refueling outage, and because the as-left torque switch settings would not impact the ability of the actuator to open the valve. In that IOD, the licensee concluded that the valve would open to fulfill its safety function. However, the licensee's IOD did not acknowledge and therefore did not address the impact on assurance of operability of not performing the stroke-time test required by the ASME OM Code. Instead, the IOD requested a prompt operability determination (POD) to perform a more detailed assessment of the nonconformance with the ASME OM Code criteria.

Part of the supporting documentation for the prompt operability determination, Engineering Evaluation 4398892, dated May 1, 2013, described that the lack of performance of a functional stroke constituted a failure to conform to the ASME OM Code Section ISTC-3310 retest requirement. Procedure 40DP-9OP26 Appendix G, Section 2.5 directs that prompt operability determinations consider the guidance in NRC Inspection Manual Chapter 0326, Appendix C for conditions involving ASME OM Code criteria. Inspection Manual Chapter 0326, Appendix C, Section C.08, "Technical Specification Operability vs. ASME OM Code Criteria" states the following:

The Technical Specifications normally applies to the overall performance of plant systems, but sometimes contains limiting values for the performance of certain components. The limiting values are specified to ensure that the design basis and safety analysis are satisfied. The values (e.g., pump flow rate, valve closure time, valve leakage rate, safety/relief valve set point pressure) are criteria that can be used to verify operability. If the values are not met at any time, the system must be declared inoperable, the LCO must be declared not met, and the applicable conditions must be entered.

After performing corrective maintenance on valve SIA-UV-651, the licensee did not establish the valve would function as intended by performing a functional stroke and collecting diagnostic data and therefore did not demonstrate that the performance of valve SIA-UV-651 met the limiting performance values mandated by the ASME OM code. The licensee's subsequent immediate and prompt operability determinations failed to declare the valve inoperable, and the licensee took no action to correct the nonconformance with the ASME OM Code requirement during the operating cycle.

The licensee restored compliance with the ASME OM code testing requirements when the valve successfully stroked and passed diagnostic testing at the beginning of the next refueling outage on October 4, 2014.

The inspectors determined that the most-significant contributor to the finding was miscommunication between different licensee work groups. Specifically licensee

engineers familiar with the in-service testing requirements did not communicate the apparent failure to meet ASME OM Code requirements to Outage Control Center and Control Room Operations staff responsible for making station level decisions.

The inspectors also determined that although the licensee engineers identified the IST program violations and initiated a condition report, these issues are NRC-identified because the inspectors identified the licensee's failure to identify procedural non-compliances within their work management, corrective action program, and operability determination programs. The inspectors considered that if the licensee had followed their work management and operability determination processes, they likely would have corrected the in-service testing violations before operating for an entire cycle with the valve inoperable due to non-compliance with the ASME OM code.

Analysis. The failure to complete ASME OM Code-required in-service testing on a Class 1 motor operated valve is a performance deficiency. This performance deficiency is more than minor, and therefore is a finding, because it affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Specifically, by not performing the required testing, the licensee did not maintain the requisite level of assurance of the equipment's capability of performing its intended function. Using Inspection Manual Chapter 0609 Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the condition was not a design or qualification deficiency, did not involve an actual loss of safety function for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. Because the most-significant contributor to the finding was that Individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained, the finding has a cross-cutting aspect in the Human Performance area and the aspect of Teamwork (H.4).

Enforcement. Palo Verde Technical Specification 5.5.8, "Inservice Testing Program," requires the inservice testing of ASME Code Class 1, 2, and 3 components in accordance with the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2001 Edition with Addenda through 2003. OM Code ISTC-3310 requires, in part, that when a valve has undergone maintenance that could affect the valve's performance, a new reference value shall be determined by an inservice test run before the time it is returned to service. Contrary to the above, on April 26, 2013, the licensee did not test Unit 1 train A shutdown cooling isolation valve SIA-UV-651, an ASME Code Class 1 valve, in accordance with ASME OM Code Section ISTC-3310. Specifically, after lifting and re-landing electrical lead wires, adjusting motor operator torque switch settings, and de-coupling and manually manipulating the valve actuator, the licensee failed to perform an inservice functional stroke SIA-UV-651 to determine new reference values for the valve's performance. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as PVAR 4398843, this violation is being treated as a non-cited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000528/2015001-01, "Failure to conduct required in-service testing in accordance with ASME OM Code."



## **1R22 Surveillance Testing (71111.22)**

### **a. Inspection Scope**

The inspectors observed four 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:

- February 4, Unit 3 “A” auxiliary feedwater pump IST
- March 5, Unit 3 “A” essential spray pond pump IST

Isolation Valve Testing

- March 10, Unit 1 FLEX piping tie in to “A” safety injection piping

Other surveillance tests:

- February 20, Unit 3 engineered safety features actuation system electrical relay testing

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 test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of four 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 changes to Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Emergency Plan, Revision 54, and Emergency Plan Implementing Procedure EP-0905, “Protective Actions,” Revision 6, submitted by letters, dated January 9, and January 6, 2014, respectively. Both documents made changes to incorporate protective action strategy associated with implementing the guidance in NUREG-0654, FEMA-REP-1, Revision 1, Supplement 3, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power plants, Formulating a Protective Action Strategy,” and several other editorial changes.

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” Revision 1, and to the standards in 10 CFR 50.47(b) to determine if the revision adequately

implemented the requirements of 10 CFR 50.54(q)(3) and 50.54(q)(4). The inspectors verified that the revisions did not reduce the effectiveness of the emergency plan. This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of two emergency action level and emergency plan change samples as defined in Inspection Procedure 71114.04.

b. Findings

No findings were identified.

**1EP6 Drill Evaluation (71114.06)**

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on February 5, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the emergency offsite facility, and attended the post-drill critique. 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 licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06

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 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors reviewed licensee event reports (LERs) for the period of January 1, 2014, through December 31, 2014, to determine the number of scrams that occurred. The inspectors compared the number of scrams reported in these LERs to the number reported for the performance indicator. Additionally, the inspectors sampled monthly operating logs to verify the number of critical hours during the period. The inspectors

used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted three samples for verification of the unplanned scrams per 7000 critical hours performance indicator on Units 1, 2, and 3 respectively, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors reviewed operating logs, corrective action program records, and monthly operating reports for the period of January 1, 2014, through December 31, 2014, to determine the number of unplanned power changes that occurred. The inspectors compared the number of unplanned power changes documented to the number reported for the performance indicator. Additionally, the inspectors sampled monthly operating logs to verify the number of critical hours during the period. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted three samples for verification of the unplanned power outages per 7000 critical hours performance indicator Units 1, 2, and 3 respectively, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE04)

a. Inspection Scope

The inspectors reviewed the licensee's basis for including or excluding in this performance indicator each scram that occurred between January 1, 2014, and December 31, 2014. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported.

These activities constituted three samples for verification of the unplanned scrams with complications performance indicator Units 1, 2, and 3 respectively, 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

The inspectors selected two issues for an in-depth follow-up:

- On February 19, the licensee's response to a series of repetitive main steam isolation signal spurious half-leg actuations in Unit 3.

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 planned corrective actions and that these actions were adequate to correct the condition.

- On March 18, the adequacy of the licensee's post-maintenance testing of diesel generator governor replacements with regard to the requirements of *IEEE 387 Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations* on Units 1, 2, and 3.

The inspectors reviewed the requirements of IEEE 387, both the current revision and an earlier version to which the licensee has formally committed. The post-modification requirements for both versions are the same with differing requirements for major and minor changes. The inspectors determined that the licensee had correctly applied the post-maintenance testing requirements for the preventive replacement of the governors on all six diesel generators. Specifically, like-for-like part replacements are categorized as minor changes per IEEE 387-1995 Section 6.6.b and can be analyzed and tested in accordance with existing licensee programs, without having to go through the full initial qualification testing program described by IEEE 387-1995 section 6.2. The purpose of the testing program is to verify the ruggedness of the engine and generator itself by subjecting it to hundreds start and load tests. The inspectors

did confirm that the licensee satisfied the requirements for the installed engines during plant construction.

These activities constitute completion of two annual follow-up samples as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

#### **4OA6 Meetings, Including Exit**

##### Exit Meeting Summary

The inspectors debriefed Mr. T. Mock, Director, Operations, and other members of the licensee's staff of the results of the licensed operator requalification program inspection on November 20, 2014, and telephonically exited with Mr. D. Heckman, Senior Consultant, Nuclear Regulatory Affairs, and other staff members on January 13, 2015. The licensee representatives acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On March 24, 2015, the inspectors conducted a telephonic exit meeting to present the results of the in-office inspection of changes to the licensee's emergency plan to Mr. R. Davis, Director, Nuclear Security & Emergency Preparedness, and other members of the licensee staff. The licensee acknowledged the issues presented.

On April 2, 2015, the inspectors presented the inspection results to Mr. R. Bement, Senior Vice President, Nuclear Site Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On May 8, 2015, the inspectors presented the inspection results to Mr. D. Mims, Senior Vice President, Nuclear Regulatory Assessment, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

R. Bement, Vice President Operations  
D. Mims, Vice President Support  
R. Lange, Operations Training Manager  
G. Andrews, Director, Nuclear Regulatory Affairs  
S. Banks, License Operator Training Supervisor  
J. Allison, Exam and Simulator Support Supervisor  
M. McGhee, Compliance Supervisor, Nuclear Regulatory Affairs  
F. Oreshack, Licensing Engineer, Nuclear Regulatory Affairs  
S. Dornseif, Licensing Engineer, Nuclear Regulatory Affairs  
D. Elkington, Licensing Engineer, Nuclear Regulatory Affairs  
D. Heckman, Senior Consultant, Nuclear Regulatory Affairs

#### **NRC Personnel**

C. Steely, Operations Engineer  
M. Hayes, Operations Engineer

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

#### **Opened and Closed**

05000528/2015001-01	NCV	Failure to conduct required in-service testing in accordance with ASME OM Code (Section 1R19)
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### **LIST OF DOCUMENTS REVIEWED**

#### **Section 1R01: Adverse Weather Protection**

##### **Procedures**

<b><u>Number</u></b>	<b><u>Title</u></b>	<b><u>Revision</u></b>
40A0-9ZZ21	Palo Verde Generating Station Acts of Nature	33
01DP-0XX01	Control and Monitoring of Potential Tornado Borne Missiles	3

#### **Section 1R04: Equipment Alignment**

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40ST-9AF07	Auxiliary Feedwater Pump AFA-P01 Monthly Valve Alignment	5
40OP-9PN01	120V AC Class 1E Instrument Channel "A"	11
40ST-9AF01	Essential Feedwater System	61
40ST-9AF08	Auxiliary Feedwater Pump AFB-P01 Monthly Valve Alignment	2

### Miscellaneous Documents

<u>Title</u>	<u>Revision</u>
Updated Final Safety Analysis Report	17B
P&I Diagram Auxillary Feedwater System Drawing Number 03-M-AFP-001	28

## **Section 1R05: Fire Protection**

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
14FT-9FP65	Appendix R/FTS Fire Barrier Surveillance (for walls, floors/ceilings and raceways)	13
14FT-9FP66	Appendix A Fire Barrier Surveillance	13
	PVNGS Pre-Fire Strategies Manual	25
	PVNGS Technical Requirements Manual	38
	Technical Requirements Manual	18
40DP-9ZZ19	Operational Considerations due to Plant Fire	27
40OP-9OW01	Oily Waste & Non-Radwaste	25

### Miscellaneous Documents

<u>Title</u>	<u>Revision</u>
Pre-Fire Strategies Manual	25
Pre-Fire Strategies Manual	24
PVNGS Updated FSAR	17

## **Section 1R06: Flood Protection Measures**

### Palo Verde Action Request

4629535                      4629059                      4634167

Condition Report Disposition Requests

4625424

Miscellaneous Documents

<u>Title</u>	<u>Revision</u>
Diesel Generator, Class 1E Standby Generation, Fuel Oil Storage and Transfer System	26
Updated Final Safety Analysis Report	17B

**Section 1R07: Heat Sink Performance**

Palo Verde Action Request

4614440                      4627090                      4626967                      4614384

Condition Report Disposition Request

4614881

Work Orders

4614453                      4482867

Miscellaneous Documents

<u>Title</u>	<u>Revision/Date</u>
Case N-705: Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks. Section XI, Division 1	10/12/2016
Acceptable Section XI Code Cases	17
Case N-513-4 Cases of Asme Boiler and Pressure Vessel Code	5/7/2014

**Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9OP02	Conduct of Shift Operations	65



<u>Procedures</u>		
<u>Number</u>	<u>Title</u>	<u>Revision</u>
15DP-0OT05	NRC Examination Security	4
	License Operator Continuing Training Program Description	64
15DP-0OT03	LOCT Biennial Written Exam Development and Sample Plan	3
40DP-0OP09	Operator Licensing and Requalification Process	1
01DP-0EM13	Licensed Operator Medical Examinations	24
15DP-0OT04	LOCT Annual and Biennial Exam Administration	4
15DP-0OT03	LOCT Biennial Written Exam Development and Sample Plan	3
15DP-0OT02	LOCT Annual and Biennial Operating Examination Sample Plan Development	3
15DP-0TR70	Simulator Configuration	3
15DP-0CC04	Simulator Performance Testing	2
15DP-0OT06	LOCT Scenario and JPM Development	2
40DP-9OP02	Conduct of Shift Operations	65
15DP-0OT05	NRC Examination Security	4
	License Operator Continuing Training Program Description	64
15DP-0OT03	LOCT Biennial Written Exam Development and Sample Plan	3
40DP-0OP09	Operator Licensing and Requalification Process	1
01DP-0EM13	Licensed Operator Medical Examinations	24
15DP-0OT04	LOCT Annual and Biennial Exam Administration	4
15DP-0OT03	LOCT Biennial Written Exam Development and Sample Plan	3
15DP-0OT02	LOCT Annual and Biennial Operating Examination Sample Plan Development	3
40DP-9OP02	Conduct of Shift Operations	66

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9SP01	Essential Spray Pond Pumps – Inservice Test	42
SES-0-05-E-06	RU-145 fails/slipped CEA/Economizer valve closure/ESD	9/2/2014

Condition Report Disposition Requests

4256323	4378792	4572981	4578169	4597614
4598524	4598527	4629668		

Miscellaneous Documents

<u>Title</u>	<u>Revision/Date</u>
Week 1 RO Exam	November 2014
Week 1 SRO Exam	November 2014
Week 0 RO Exam	November 2014
Week 0 SRO Exam	November 2014
Week 1 Operations Test	November 2014
Week 0 Operations Test	November 2014
71111.11 Pre-Inspection Self-Assessment	
Simulator Discrepancy Report	
Operator License Activation/Reactivation Card	April 18, 2014
Palo Verde Nuclear Generating Station License Operator Continuing Training	64
Operations Training Department Critical Task List	October 15 2014
UFSAR Time Critical Actions	
Plant Events and Industry Operating Experience Incorporated into LOCT	

**Section 1R12: Maintenance Effectiveness**Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
70DP-0MR01	Maintenance Rule	37

Palo Verde Action Request

3151980	3652092
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## Miscellaneous Documents

<u>Title</u>	<u>Revision/Date</u>
Palo Verde Maintenance Rule Intranet Database	Current 3/31/2015

## **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9OP37	Safety Function Determination Procedure	9
40ST-9EC03	Essential Chilled Water and Ventilation Systems Inoperable Actions Surveillance	20
40DP-9AP21	Protected Equipment	6
73ST-9SP01	Essential Spray Pond Pumps – Inservice Test	39
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	22
40DP-9AP21	Protected Equipment	6
40DP-9RS01	Operations Department Online Nuclear Risk Management Mode 1 and 2	3
51DP-9OM03-02	Emergent Work and Scope Expansion Decision Guide	1

## **Section 1R15: Operability Determinations and Functionality Assessments**

### Palo Verde Action Request

4608017                  4558624

### Condition Report Disposition Requests

3126014                  4532316

## Miscellaneous Documents

<u>Title</u>	<u>Revision</u>
Palo Verde Nuclear Generating Station Design Basis Manual	20
19108 "CPT" Exchange APS Log Number 13-MO18-00596	7
19R "CPT" Exchanger APS Log Number 13-MO18-00606	8
ODMI Evaluation/Implementation Plan: Unit 3 Reactor Vessel Flange Indication from the Inner O-ring	2

## **Section 1R19: Post-Maintenance Testing**

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40ST-9DG01	Diesel Generator A Test	45
73ST-9AF02	AFA-P01 Recirc Flow – Inservice Test	54
36ST-9AF03	“B” Train Auxiliary Flow Instrumentation Calibration	4
40ST-9ZZ22	Remote Shutdown Instrumentation Channel Checks	11
32ST-9ZZ34	Class 1E Battery Charger 18 Month Surveillance Test	12

### Palo Verde Action Request

4618657

### Work Orders

4597116            4439115            4487848            4455760            4628931  
4445893

### Condition Report Disposition Request

4619982

### Miscellaneous Documents

<u>Title</u>	<u>Date</u>
Daily Plant Status Package	January 29, 2015

## **Section 1R22: Surveillance Testing**

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9AF02	AFA-P01 Recirc Flow – Inservice Test	54
36ST-9SA02	ESFAS “B” Train Subgroup Relay Function Test	44
73ST-9SP01	Essential Spray Pond Pumps – Inservice Test	42

### Palo Verde Action Request

4338142            4628910

Work Orders

4445911	4629668	4418147	4418123	4418186
4418212	4449535			

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

Procedures and Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
102-06984-JF	Revision 6 to EP-905, Protective Actions	January 6, 2015
102-06989-JF	Revision 54, PVNGS Emergency Plan	January 9, 2015
Plan	PVNGS Emergency Plan	54
EP-905	Protective Actions	6

**Section 4OA2: Problem Identification and Resolution**

Work Orders

2835485	2859190
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Miscellaneous Documents

<u>Title</u>	<u>Date</u>
IEEE Std 387 Trial-Use Standard: Criteria for Diesel-Generating Units Applied as Standby Power Supplies for Nuclear Power Generating Stations	1972
IEEE Std 387 Standard Criteria for Diesel-Generating Units Applied as Standby Power Supplies for Nuclear Power Generating Stations	1977
IEEE Std 387 Standard Criteria for Diesel-Generating Units Applied as Standby Power Supplies for Nuclear Power Generating Stations	1995