



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

February 13, 2014

Randall K. Edington, Executive
Vice President, Nuclear/CNO
Arizona Public Service Company
P.O. Box 1856
Buckeye, AZ85326

**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED
INSPECTION REPORT 05000528/2013005, 05000529/2013005, AND
05000530/2013005**

Dear Mr. Edington:

On December 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Palo Verde Nuclear Generating Station Units 1, 2, and 3. On January 9, 2014, the NRC inspectors discussed the results of this inspection with Mr. 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 NRC requirements. Also, inspectors documented licensee-identified violations which were determined to be of very low safety significance. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, 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 <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Nick Taylor, 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 05000528/2013005, 05000529/2013005, and 05000530/2013005
w/Attachment: 1. Supplemental Information
2. Request for Radiation Safety Information

Electronic Distribution to Palo Verde Nuclear Generating Station

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TBrown	MBaquera	DReinert	BHagar	TFarnholtz	GMiller
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000528, 05000529, 05000530
License: NPF-41, NPF-51, NPF-74
Report: 05000528/2013005, 05000529/2013005, 05000530/2013005
Licensee: Arizona Public Service Company
Facility: Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location: 5951 South Wintersburg Road
Tonopah, Arizona
Dates: October 1 through December 31, 2013
Inspectors: T. Brown, Senior Resident Inspector
M. Baquera, Resident Inspector
D. Reinert, Resident Inspector
I. Anchondo, Senior Reactor Inspector
L. Carson II, Senior Health Physicist
J. O'Donnell, Health Physicist
S. Graves, Senior Reactor Inspector, Engineering Branch 2
J. Laughlin, Emergency Preparedness Inspector, NSIR
Approved By: Nick Taylor, Chief, Project Branch D
Division of Reactor Projects

SUMMARY

IR 05000528, 529, 530/2103005; 10/01/2013 – 12/31/2013; Palo Verde Nuclear Generating Station Units 1, 2, and 3; Integrated Resident and Regional Report, Plant Modifications, Identification and Resolution of Problems

The inspection activities described in this report were performed between October 1, 2013, and December 31, 2013, by the resident inspectors at the Palo Verde Nuclear Generating Station and three inspectors from the NRC's Region IV office and other NRC offices. One Green non-cited violation and one finding of very low safety significance (Green) are documented in this report. Two licensee-identified violations of very low safety significance are documented in this report. 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 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."

Cornerstone: Initiating Events

- Green. The inspectors reviewed a Green self-revealing finding for the licensee's failure to promptly identify and correct an adverse condition. Specifically, the licensee failed to identify that operating limits for main feedwater pump (MFP) vapor extractors did not prevent lube oil leakage, and insulation surrounding the Unit 2 train A MFP became soaked with oil. As a result, the oil soaked insulation, exposed to hot surface temperatures over time, became degraded and initiated a fire in the turbine building, resulting in declaration of an unusual event. No violation of regulatory requirements occurred because the finding occurred on non-safety secondary plant equipment. The licensee entered the finding into the licensee's corrective action program as Condition Report Disposition Request 4458504 and 4452395.

The failure to promptly identify and correct an adverse condition was a performance deficiency. The performance deficiency is more than minor, and therefore is a finding, because it was associated with the Initiating Events Cornerstone and was a precursor to a more significant event which resulted in a fire and an emergency declaration. The inspectors assessed the significance of the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, appendix A, "Significance Determination Process for Findings At-Power," using Exhibit 1, "Initiating Events Screening Questions." The finding required a detailed risk evaluation because it resulted in increasing the fire frequency. A Region IV senior reactor analyst performed the detailed risk evaluation. The bounding change to the core damage frequency was 1.0E-7/year (Green). The most prominent core damage sequences included a transient coupled with various failures of the auxiliary feedwater and main feedwater pumps. The automatic runback function of the feedwater control system helped to minimize the change to the core damage frequency. The inspectors determined the finding has a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience (OE) component because the licensee failed to implement and institutionalize OE through changes to station processes, procedures, equipment, and training programs to ensure MFP turbine vapor extractors are operated appropriately and that fire hazards associated with oil soaked insulation are promptly identified and corrected [P.2(b)]. (Section 40A2)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the failure to assure that a modification to the main steam and main feedwater isolation valve accumulators was suitable for the reliable operation of these components. Specifically, on September 4, 2009, the licensee failed to assess the suitability of a small dead band for a thermal relief valve in the accumulator valve manifold assembly and the impact on reliable operation of the associated valves. The licensee entered this issue into the corrective action program as Palo Verde Action Request 4429273. The licensee isolated the thermal relief valve from the actuators.

The failure to assure that the modification of the main steam and main feedwater isolation valve accumulators was suitable for the reliable operation of these components was a performance deficiency. The performance deficiency is more than minor, and therefore is a finding, because it was associated with the Mitigating Systems Cornerstone attribute of equipment performance and adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of the issue under the Significance Determination Process, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at-Power." The inspectors concluded the finding was of very low safety significance (Green) because all questions in Exhibit 2 could be answered in the negative. The inspectors determined that the finding had a cross-cutting aspect in the area of human performance associated with resources component because the licensee did not maintain design margins by minimizing long standing equipment issues [H.2(a)]. (Section 1R18)

Licensee-Identified Violations

Two violations of very low safety significance that were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

PLANT STATUS

Unit 1 began the inspection period at essentially full power. On November 6, 2013, operators reduced power to approximately 60 percent as a result of a failed main steam isolation valve. The licensee repaired the valve and returned the unit to full power on November 9, 2013. Unit 1 operated at essentially full power for the remainder of the inspection period.

Unit 2 began the inspection period at essentially full power. On December 2, 2013, Unit 2 automatically tripped due to a trip of reactor coolant pump 1A. The pump tripped as a result of a motor fault. The licensee replaced the pump motor and restarted the unit on December 13, 2013. Operators returned Unit 2 to essentially full power on December 16, 2013. Unit 2 operated at essentially full power for the remainder of the inspection period.

Unit 3 began the inspection period at essentially full power. Operators shut down Unit 3 on October 5, 2013 for refueling outage 3R17. The licensee completed the outage and started up Unit 3 on November 25, 2013. Operators returned Unit 3 to essentially full power on November 28, 2013. On December 2, 2013, operators reduced power and began a controlled plant shutdown in response to a dropped control element assembly. The licensee completed repairs and realigned the control element assembly on December 3, 2013. Operators returned Unit 3 to essentially full power on December 4, 2013. Unit 3 operated at essentially full power for the remainder of the inspection period.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On October 9, 2013, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions. The inspectors reviewed plant design features, the licensee's procedures to respond to impending high wind and blowing dust conditions, and the licensee's implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

These activities constituted one sample of readiness for impending adverse weather conditions, 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 walk-downs of the following risk-significant systems:

- November 13, 2013, Unit 2, containment spray system, train A
- November 14, 2013, Unit 2, low pressure safety injection system train A
- December 5, 2013, Unit 2, essential cooling water 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.

.2 Complete Walkdown

a. Inspection Scope

On October 14, 2013, the inspectors performed a complete system walk-down inspection of the Unit 3 spent fuel pool cooling system. The inspectors reviewed the licensee's procedures and system design information to determine the correct system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, 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:

- October 14, 2013, Unit 3, fuel handling building, all elevations
- November 13, 2013, Unit 2, control building, elevations 74' and 100'
- November 19, 2013, Unit 3, containment, all elevations
- December 6, 2013, Unit 2, control building, elevations 120', 140', and 160'

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 December 16, 2013, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose one plant area containing risk-significant structures, systems, and components that were susceptible to flooding:

- Unit 1, auxiliary feedwater pump rooms

The inspectors reviewed plant design features and licensee procedures for coping with internal 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 operator actions credited for flood mitigation could be successfully accomplished.

In addition, on October 29, 2013, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected one underground bunker that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:

- Unit 2, diesel fuel oil storage tank underground cables

The inspectors observed the material condition of the cables and splices contained in the bunkers 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 flood protection measures sample and one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

Completion of Sections .1 through .5, below, constitutes completion of one sample as defined in Inspection Procedure 71111.08-05.

.1 Inspection Activities Other Than Steam Generator Tube Inspection, Pressurized Water Reactor Vessel Upper Head Penetration Inspections, and Boric Acid Corrosion Control (71111.08-02.01)

a. Inspection Scope

The inspectors observed 15 nondestructive examination activities and reviewed four nondestructive examination activities that included three types of examinations. The licensee did not identify any relevant indications accepted for continued service during the nondestructive examinations.

The inspectors directly observed the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Steam Generator	SG1 Skirt Weld (13-MT-3001)	Magnetic Particle
Main Steam	Atmospheric Dump 2 (13-778)	Liquid Penetrant
Main Steam	Valve 3JSGEUV0183 (13-771)	Liquid Penetrant
Main Steam	Valve 3JSGEUV0169 (13-769)	Liquid Penetrant
Main Steam	Atmospheric Dump 2/52-68A (13-739)	Liquid Penetrant
Main Steam	3PSGEL100/3JSGEUV0183 (13-739)	Liquid Penetrant
Reactor Vessel	Bottom Mounted Instrumentation Nozzles (1-61)	Time of Flight Detraction (TOFL) Ultrasonic
Reactor Vessel	RVBH NDE Region Centered around BMI Nozzle #3 Penetration (370-00-PT-001)	Liquid Penetrant
Reactor Vessel	Final J-Groove Preparation RVBH BMI Nozzle #3 (730-00-PT-005)	Liquid Penetrant
Reactor Vessel	RVBH BMI Nozzle 3 Repair from report 730-00-PT-005 (A30-00-PT-006)	Liquid Penetrant
Reactor Vessel	½-inch Thickness of Weld Pad BMI Nozzle #3 (460-00-PT-002)	Liquid Penetrant

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Reactor Vessel	Final Weld Pad Thickness BMI Nozzle #3 (555-00-PT-003)	Liquid Penetrant
Reactor Vessel	½-inch Increment on Nozzle to Weld Pad Partial Penetration Weld BMI Nozzle 3 (790-00-PT-007)	Liquid Penetrant
Reactor Vessel	1½-inch Increment on Nozzle to Weld Pad Partial Penetration Weld BMI Nozzle 3 (840-00-PT-009)	Liquid Penetrant
Reactor Vessel	1-inch Increment on Nozzle to Weld Pad Partial Penetration Weld BMI Nozzle 3 (810-00-PT-008)	Liquid Penetrant

The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Reactor Vessel	RVBH NDE Region Centered around BMI Nozzle #3 Penetration (370-00-PT-001)	Liquid Penetrant
Reactor Vessel	Bare Metal BMI Nozzle #3	Ultrasonic
Reactor Vessel	½-inch Thickness of Weld Pad BMI Nozzle #3 (470-00-UT-002)	Ultrasonic
Reactor Vessel	Final Thickness of Weld Pad BMI Nozzle #3 (560-00-UT-003)	Ultrasonic

During the review and observation of each examination, the inspectors verified that activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspectors also verified the qualifications of all nondestructive examination technicians performing the inspections were current.

The inspectors observed three welds on pressure retaining risk significant systems.

The inspectors directly observed a portion of the following welding activities:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>WELD TYPE</u>
Main Steam	Valve 3JSGEUV0183 Replacement (Weld #3779490-1)	Tungsten Arc Welding (GTAW)
Reactor Vessel	Weld Pad BMI Nozzle #3	Machine Tungsten Arc Welding (GTAW)
Reactor Vessel	J-groove Weld of BMI Nozzle #3	Tungsten Arc Welding (GTAW)

The inspectors verified that the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX, requirements. The inspectors also verified that essential variables were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.01.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities (71111.08-02.02)

a. Inspection Scope

No vessel upper head inspection was required or performed during this refueling outage. These actions constitute completion of the requirements for Section 02.02.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities (71111.08-02.03)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedure 73DP-9ZC01, "Boric Acid Corrosion Control Program," Revision 4, and Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 16. The inspectors verified that the visual inspections emphasized locations where boric acid leaks could cause degradation of safety significant components, and that engineering evaluation used corrosion rates applicable to the affected components and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity. The inspectors confirmed that corrective actions taken were consistent with the ASME Code, and 10 CFR 50, Appendix B requirements. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.03.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities (71111.08-02.04)

a. Inspection Scope

No inspections were planned for refueling outage U3R17. During the internal inspection of a High Pressure Feed Water Heater, several metallic parts were discovered prompting Foreign Object Search and Retrieval (FOSAR) inspections on both Steam Generators. The following areas were inspected:

- Hot and cold leg top of tubesheet annulus region (approximately 5 tube rows into the bundle were viewed from the annulus).
- Hot and cold leg blowdown lanes (approximately 2 rows deep were viewed from the lane).
- In Bundle Inspection in the area of Part 31-15.

The FOSAR inspection results were as followed:

- Seventeen items were identified as foreign objects in steam generator SG 31. Three objects were removed that included two small pieces of tube scale/sludge rocks, and one metallic piece. The licensee evaluated and accepted the remaining 14 pieces left in place.
- Twenty items were identified as foreign objects in steam generator SG 32. Six objects were removed including a piece of metallic material, graphite material, and a small wire. The licensee evaluated and accepted the remaining 14 pieces left in place.

The licensee opted, due to an object wear mark in SG 31 found during FOSAR inspections, to perform eddy current (ECT) examinations on SG 31 only. The inspectors reviewed the steam generator tube ECT examination scope and verified that it met technical specification requirements, EPRI guidelines, and commitments made to the NRC. The inspectors confirmed that no repairs were required at the conclusion of the ECT examinations. The scope of the licensee's ECT examinations included:

- Quantify the depth of the flaw that was discovered on tube located at R167 C84. This tube contained the wear scar found during FOSAR inspections.
- ECT (Bobbin and Plus Point) inspections in areas adjacent to where the metallic foreign object was removed. The ECT inspections consisted of 15 additional tubes.
- ECT (Bobbin and Plus Point) inspections in areas adjacent to the tubes where foreign objects were left in place.

The inspectors reviewed the site-specific qualifications for the techniques being used and verified that eddy current test data analyses were adequately performed per EPRI and site specific guidelines.

These actions constitute completion of the requirements for Section 02.04.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems (71111.08-02.05)

a. Inspection scope

The inspectors reviewed 13 condition reports associated with inservice inspection activities and determined that the corrective actions taken were appropriate. The inspectors concluded that the licensee has an appropriate threshold for entering inservice inspection issues into the corrective action program, and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying inservice inspection industry operating experience. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements of Section 02.05.

b. Findings

No findings were identified.

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

.1 Quarterly Review of Licensed Operator Requalification Program

a. Inspection Scope

On November 21, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during training. The inspectors assessed the following areas:

- Licensed operator performance
- The ability of the licensee to administer the training
- The modeling and performance of the control room simulator
- The quality of post-scenario critiques
- Follow-up actions taken by the licensee for identified discrepancies

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 October 5, 2013, the inspectors observed the performance of on-shift licensed operators in the Unit 3 main control room. At the time of the observations, Unit 3 was in a heightened activity due to a Unit shutdown for the start of refueling outage 3R17. 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 sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.3 Annual Inspection

a. Inspection Scope

The licensed operator requalification program involves two training cycles that are conducted over a two-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. For this annual inspection requirement, the licensee was in the first part of the training cycle.

The inspector reviewed the results of the operating tests for all units to satisfy the annual inspection requirement.

On December 30, 2013, the licensee informed the lead inspector of the following Units 1, 2, and 3 results:

- 18 of 18 crews passed the simulator portion of the operating test
- 99 of 100 licensed operators passed the simulator portion of the operating test
- 99 of 100 licensed operators passed the Job Performance Measure (JPM) portion of the examination

The individual that failed the simulator portion of the operating test was remediated, retested, and passed their retake test. The individual that failed the JPM portion of the operating test was remediated, retested, and passed their retake test. Twenty-five licensed operators were not required to take the annual operating test since they recently obtained their license.

The inspector completed one inspection sample of the annual licensed operator requalification program.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- November 18, 2013, Unit 3, class 1E 4.16KV power system
- November 21, 2013, all units, Review of the Maintenance Rule Program a(3) Periodic Evaluation
- November 27, 2013, Unit 3, reactor coolant system
- December 16, 2013, all units, chemical and volume control system

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 four maintenance effectiveness samples, 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 three 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:

- October 9, 2013, Unit 3, refueling outage 3R17
- October 29, 2013, Unit 2, diesel fuel oil storage tank safety-related instrumentation and control cable modifications
- December 5, 2013, Units 2 and 3, risk assessments associated with heavy lifts and crane activities near safety related equipment

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 three emergent work activities that had the potential to cause an initiating event, to affect the functional capability of mitigating systems, or to impact barrier integrity:

- October 7, 2013, Unit 3, reactor vessel bottom mounted instrument leakage
- December 2, 2013, Unit 2, reactor trip due to loss of reactor coolant pump 1
- December 2, 2013, Unit 3, dropped control element assembly

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 three 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 two operability determinations that the licensee performed for degraded or nonconforming structures, systems, or components (SSCs):

- November 7, 2013, Unit 3, failed hole saw during hot tap on safety injection vent valve
- November 27, 2013, Unit 3, remnant flaw number 3 bottom mounted instrument tube

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 two operability review samples, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed one temporary plant modification that affected risk-significant structures, systems, and components (SSCs):

- October 24, 2013, Unit 3, temporary power supply to Fuel Pool Cooling Pump 3MPCBP01

The inspectors verified that the licensee had installed this temporary modification in accordance with technically adequate design documents. The inspectors verified that this modification did not adversely impact the operability or availability of affected SSCs. The inspectors reviewed design documentation and plant procedures affected by the modification to verify the licensee maintained configuration control.

These activities constitute completion of one sample of temporary modifications, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors reviewed two permanent plant modifications that affected risk-significant structures, systems, and components (SSCs):

- December 18, 2013, Units 1, 2, and 3, thermal relief valve assembly installation on main steam and main feedwater isolation valve actuators
- November 13, 2013, Unit 3, emergency diesel generator B automatic voltage regulator modification

The inspectors reviewed the design and implementation of the modifications. The inspectors verified that work activities involved in implementing the modifications did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability of the SSCs as modified.

These activities constitute completion of two samples of permanent modifications, as defined in Inspection Procedure 71111.18.

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the failure to assure that a modification to

the main steam and main feedwater isolation valve accumulators was suitable for the reliable operation of these components. Specifically, on September 4, 2009, the licensee failed to assess the suitability of a small dead band for a thermal relief valve in the accumulator valve manifold assembly and the impact on reliable operation of the associated valves.

Description. On June 28, 2013, a thermal relief valve (TRV) for the hydraulic actuator of a main steam isolation valve failed to reseat after opening. This caused a depressurization of the actuator, and without operator intervention would have caused the valve to become inoperable. During the review of the issue, the inspectors determined that the licensee installed this TRV as part of a manifold assembly via a modification to the actuators for the main steam and main feedwater isolation valves. The hydraulic accumulator must maintain pressure between 5400 psi and 5100 psi to remain operable. Maintaining this small band proved a challenge to operators because of large ambient temperature swings and because the solenoid valve, used to control the pressure, had no throttling characteristics. The TRV manifold assembly included a manual bypass valve and a TRV to control hydraulic pressure in the system. The manual valve was installed to allow for a slow controlled depressurization, while the TRV gave the operators an option for automatic control. The licensee stated that the intent of the modification that installed the manifold assembly was to enhance the reliability of the affected systems and reduce operator burden when restoring hydraulic pressure within operational parameters.

The inspectors noted the licensee's long standing acceptance of unreliable performance of the TRV suggesting the underlying issues with the design. The pressure differential needed for the TRV to open and then reseat is identified as the dead band. In this application, the dead band was as large as the intended operating band of pressure, 300 psi, and the TRV could not reliably close in that band to maintain system operability. The inspectors identified that the licensee had concerns with the dead band during the modification, but decided that any adverse effects of a failure to close could be handled by operators and design elements. The design relied on the hydraulic pump to keep up with the blowdown from the TRV; however, engineering personnel never identified this as a critical design parameter and did not identify testing to assure that the hydraulic pump could keep up with the blowdown flow. The inspectors reviewed the operational history of this TRV modification and identified that the TRV had failed to reseat 21 times since the 2010 installation in all three units. During three of those depressurizations, the licensee declared a main steam isolation valve inoperable because of the loss of hydraulic pressure. During these failures, the licensee did not readdress the suitability of the design, but instead focused on mitigating the failures through operator actions.

After the failure of the TRV to reseat in June of 2013, the licensee isolated the TRVs in all three units to mitigate any future challenges to operability from the TRV and is planning to replace the actuators for the main steam and main feedwater isolation valves.

Analysis. The failure to assure that the modification of the main steam and main feedwater isolation valve accumulators was suitable for the reliable operation of these components was a performance deficiency. The performance deficiency is more than minor, and therefore is a finding, because it was associated with the Mitigating Systems Cornerstone attribute of equipment performance and adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to

initiating events to prevent undesirable consequences. The inspectors evaluated the significance of the issue under the Significance Determination Process, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at-Power." The inspectors concluded the finding was of very low safety significance (Green) because all questions in Exhibit 2 could be answered in the negative. The inspectors determined that the finding had a cross-cutting aspect in the area of human performance associated with resources component because the licensee did not maintain design margins by minimizing long standing equipment issues [H.2(a)]

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires in part, that measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components. Contrary to this, on September 4, 2009, engineering personnel failed to review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components. Specifically, engineering personnel failed to assess the suitability of a small dead band for a thermal relief valve in the main steam and main feedwater isolation valve accumulators valve manifold assembly, and the impact of those assemblies on reliable operation of the associated valves. The licensee did not identify critical design parameters with the closure of the thermal relief valve and did not perform design validation testing. As a result, the thermal relief valves failed to reclose after opening and caused inoperability in the associated valves. The licensee has isolated the thermal relief valves in all three units and is planning to replace the valves' accumulators in the future. The licensee entered the finding into the corrective action program as Palo Verde Action Request 4429273: NCV 05000528;528;530/2013005-01, "Inadequate Modification of Safety Related Accumulators"

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed five post-maintenance testing activities that affected risk-significant structures, systems, or components (SSCs):

- October 24, 2013, Unit 3, emergency diesel generator B
- October 28, 2013, Unit 3, 480VAC inverter 3EPKDN44
- November 12, 2013, Unit 3, essential chiller B
- November 18, 2013, Unit 3, reactor coolant pump 1A
- December 2, 2013, Unit 3, power switch assembly replacement for dropped control element assembly

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

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

During the Unit 3 refueling outage, that concluded on November 26, 2013, and the Unit 2 short notice maintenance outage, that concluded on December 13, 2013, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan prior to the outage
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities
- Observation and review of reduced-inventory and mid-loop activities
- Observation and review of fuel handling activities
- Monitoring of heat-up and startup activities

These activities constitute completion of one refueling outage sample and one outage for other activity sample, as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

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 test:

- November 19, 2013, Unit 2, auxiliary feedwater pump B inservice test

Containment isolation valve surveillance test:

- October 17, 2013, Unit 3, containment penetration 38 isolation valve leak-rate testing

Other surveillance tests:

- October 15, 2013, Unit 3, train B integrated safeguards testing
- December 16, 2013, Unit 1, auxiliary feedwater pump B inservice test

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 NSIR headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures (EPIPs) and the Emergency Plan located under ADAMS accession numbers ML13262A145 and ML13350A023 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.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

Training Evolution Observation

a. Inspection Scope

On December 17, 2013, the inspectors observed an emergency response origination tabletop drill 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.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

The inspectors assessed the licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities. The inspectors assessed the licensee's implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures. The inspectors walked down various portions of the plant and performed independent radiation dose rate measurements. The inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors reviewed licensee performance in the following areas:

- The hazard assessment program, including a review of the licensee's evaluations of changes in plant operations and radiological surveys to detect dose rates, airborne radioactivity, and surface contamination levels
- Instructions and notices to workers, including labeling or marking containers of radioactive material, radiation work permits, actions for electronic dosimeter alarms, and changes to radiological conditions
- Programs and processes for control of sealed sources and release of potentially contaminated material from the radiologically controlled area, including survey performance, instrument sensitivity, release criteria, procedural guidance, and sealed source accountability
- Radiological hazards control and work coverage, including the adequacy of surveys, radiation protection job coverage and contamination controls, the use of electronic dosimeters in high noise areas, dosimetry placement, airborne radioactivity monitoring, controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools, and posting and physical controls for high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements
- Audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

These activities constitute completion of one sample of radiological hazard assessment and exposure controls as defined in Inspection Procedure 71124.01.

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- Site-specific ALARA procedures and collective exposure history, including the current three year rolling average, site-specific trends in collective exposures, and source-term measurements
- ALARA work activity evaluations/post-job reviews, exposure estimates, and exposure mitigation requirements
- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

These activities constitute completion of one sample of occupational ALARA planning and controls as defined in Inspection Procedure 71124.02.

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

40A1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index: Heat Removal Systems (MS08)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of fourth quarter 2012 through third quarter 2013, to verify the accuracy and completeness of the reported data. 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 reported data.

These activities constitute completion of three mitigating systems performance index - heat removal system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Residual Heat Removal Systems (MS09)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of fourth quarter 2012 through third quarter 2013, to verify the accuracy and completeness of the reported data. 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 reported data.

These activities constitute completion of three mitigating systems performance index - residual heat removal systems sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index: Cooling Water Support Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of fourth quarter 2012 through third quarter 2013, to verify the accuracy and completeness of the reported data. 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 reported data.

These activities constitute completion of three mitigating systems performance index - cooling water system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors reviewed corrective action program records documenting unplanned exposures and losses of radiological control over locked high radiation areas and very high radiation areas during the period of March 31, 2012, to September 30, 2013. The inspectors reviewed a sample of radiologically controlled area exit transactions showing exposures greater than 100 mrem. 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 reported data.

These activities constituted verification of the occupational exposure control effectiveness performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.5 Radiological Effluent Technical Specifications (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed corrective action program records for liquid or gaseous effluent releases that occurred between March 31, 2012, and September 30, 2013, and were reported to the NRC to verify the performance indicator data. 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 reported data.

These activities constituted verification of the radiological effluent technical specifications (RETS)/offsite dose calculation manual (ODCM) radiological effluent occurrences performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

40A2 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 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program, performance indicators, system health reports, periodic trend reviews, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors verified that the licensee was taking corrective actions to address identified adverse trends.

These activities constitute completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Findings

No findings were identified

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

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

During a review of items entered in the licensee's corrective action program, the inspectors recognized corrective action items documenting issues that warranted further inspection:

- November 20, 2013, Units 1, 2, and 3, operator workarounds

- November 27, 2013, CRDR 4440196 associated with a Unit 3 battery load bank fire, CRDR 4452395 associated with a Unit 2 lagging fire in the Unit 2 main feedwater pump, and CRDR 4458504.

The inspectors considered the following during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of two annual follow-up samples, as defined in Inspection Procedure 71152.

b. Findings

Introduction. The inspectors reviewed a Green self-revealing finding for the licensee's failure to promptly identify and correct an adverse condition. Specifically, the licensee failed to identify that operating limits for main feedwater pump (MFP) vapor extractors did not prevent lube oil leakage, and insulation surrounding the Unit 2 train A MFP became soaked with oil. As a result, the oil soaked insulation, exposed to hot surface temperatures over time, became degraded and initiated a fire in the turbine building, resulting in declaration of an unusual event.

Description. On September 4, 2013, Unit 2 was operating at full power when plant personnel discovered a fire in the insulation on the outboard bearing of the train A main feed water pump turbine. Plant personnel extinguished the fire, but the fire reflashed before insulation was removed and operators increased vapor extractor differential pressure. The plant remained at full power and no significant damage occurred to plant equipment. The licensee's evaluation of the fire determined that oil vapor, leaking from around the shaft of the MFP turbine, had allowed the calcium silicate insulation to become oil-soaked and degraded, resulting in an exothermic reaction and auto-ignition of the oil.

In November 2013, the licensee completed a root cause and adverse trend evaluations, as documented in CRDRs 44452395 and 4458504. The evaluations identified several missed opportunities from external operating experiences associated with oil-soaked insulation with a potential to auto-ignite when exposed over a period of time of extended exposure to high temperatures. Between 2008 and 2012, the licensee evaluated similar events involving fire in oil-soaked calcium silicate insulation at other sites. The licensee did not adequately incorporate these lessons learned into station programs and procedures.

Additionally, the licensee's evaluation concluded that plant operating procedures allowed the MFP vapor extractor to operate at a differential pressure that was not sufficient to prevent turbine lube oil leakage passed labyrinth seals and identified internal operating experience from Unit 3 that could have prevented the event. Specifically, on May 8, 2012, Unit 3 operators identified oil vapor and smoke coming from the train A MFP turbine insulation. After they increased the vacuum on the vapor extractor, the oil vapor

and smoke disappeared. The licensee entered the issue into the corrective action program but failed to identify the connection between vapor extractor operating limits and potential fire hazard from oil soaked calcium silicate insulation.

The licensee's corrective actions include revising operating procedures to increase the minimum differential pressure for the MFP turbine vapor extractors, adjusting the insulation configuration to minimize the potential fire hazard and allow for routine inspection of the seal area, improving the station's response to internal and external fire event operating experience, and training the operators and station personnel on the potential fire hazard associated with oil soaked insulation.

Analysis. The failure to promptly identify and correct an adverse condition was a performance deficiency. The performance deficiency is more than minor, and therefore is a finding, because it was associated with the Initiating Events Cornerstone and was a precursor to a more significant event which resulted in a fire and an emergency declaration. The inspectors assessed the significance of the finding in accordance with the NRC Inspection Manual Chapter (IMC) 0609, appendix A, "Significance Determination Process for Findings At-Power," using Exhibit 1, "Initiating Events Screening Questions." The finding required a detailed risk evaluation because it resulted in increasing the fire frequency.

The analysts performed simplified calculations to determine the change to the core damage frequency (delta-CDF) for the fire. The analyst used the Palo Verde Standardized Plant Analysis Risk (SPAR) model, Revision 8.20, with a truncation limit of E-11. The analyst relied on the following influential assumptions for this evaluation:

- The analyst assumed a one-year exposure period. The existence of oil in the lagging was a long-standing issue.
- The fire ignited in the lagging on components associated with MFP A. No other equipment was affected by the fire.
- Maximum propagation of the fire could cause feedwater pump A to trip. During the actual fire, this did not occur. However, given a fire in the area, the probability of a feedwater pump trip did increase. Given the fire, the analyst assumed a maximum feedwater pump trip probability of one in two (0.5). This was very conservative.
- If the pump had tripped, the plant should have runback power to within the capacity of a single feedwater pump. This automatic feature would have helped to avoid a plant transient (scram). Still, a small probability remained that the automatic runback feature would have failed and the plant would have subsequently scrambled. Using judgment, the analyst assumed that the probability of a plant trip given a single feedwater pump trip was 10 percent.
- From the above two assumptions and to model the increased risk associated with the fire, the analyst increased the transient (scram) frequency by 0.05.

The resulting change to the core damage frequency was 1E-7/year. The most prominent core damage sequences included a transient coupled with various failures of

the auxiliary feedwater and main feedwater pumps. The automatic runback functions of the feedwater control system helped to minimize the core damage frequency. To evaluate the incremental large early release frequency (ILERF), the analyst used Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process." Palo Verde has a large dry containment. The finding would not significantly impact ILERF because it did not affect the intersystem loss of coolant accident or steam generator tube rupture categories. Therefore, the ILERF was less than 1E-8.

The inspectors determined the finding has a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience (OE) component because the licensee failed to implement and institutionalize OE through changes to station processes, procedures, equipment, and training programs to ensure MFP turbine vapor extractors are operated appropriately and that fire hazards associated with oil soaked insulation are promptly identified and corrected [P.2(b)].

Enforcement. Procedure 01PR-0AP04, "Corrective Action Program," Revision 7, required that adverse conditions are promptly identified, evaluated, and corrected. Contrary to this, on September 2, 2013, maintenance personnel failed to adequately identify, evaluate, and correct adverse conditions associated with the Unit 2 vapor extractor operating differential pressure and with main feedwater pump oil soaked insulation. As a result, the insulation auto-ignited and resulted in a fire and emergency declaration. No violation of regulatory requirements occurred because the finding occurred on non-safety related secondary plant equipment. The licensee entered the finding into the corrective action program as CRDRs 4458504 and 4452395: FIN 05000529/2013005-02, "Failure to Identify and Correct an Adverse Condition."

40A3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report (LER) 05000528;529;530/2012-006-00, Safety Injection System Check Valve Testing Could have Resulted in Less than Required Injection Flow

On December 21, 2012, the licensee identified that latent test procedure deficiencies allowed a cold leg safety injection header manual drain valve common to both emergency core cooling system (ECCS) trains to be open without an evaluation that ECCS flow requirements would be satisfied. The licensee determined that deficiencies in previous revisions of surveillance test (ST) procedure 73ST-9SI05, "Leak Test of HPSI/LPSI Containment Isolation Check Valves," existed since 1983. To prevent recurrence, the procedure was revised to ensure the minimum required ECCS flow is available during safety injection check valve testing.

The licensee's failure to develop an adequate test procedure which could have prevented ECCS from being capable of performing its design based functions was a performance deficiency. This performance deficiency was more than minor because it was associated with the procedure quality attribute of the mitigating system cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems to respond to initiating events to prevent undesirable consequences.

The inspectors documented this issue as a licensee-identified violation in Section 40A7 of this report. Additionally, the inspectors previously documented a non-cited violation in

Section 1R15 of inspection report 05000528;529;530/2012002 for the failure to promptly identify and correct a condition adverse to quality associated with this issue. The inspectors did not identify any additional concerns from their review of the LER. This LER is closed.

.2 (Closed) Licensee Event Report 05000529/2013-001-00 and Supplement 05000529/2013-001-01, Condition Prohibited by Technical Specifications due to Emergency Diesel Generator Low Output Voltage

On January 16, 2013, during monthly surveillance testing, the Unit 2 train B emergency diesel generator did not reach its required output voltage. The licensee declared the emergency diesel generator inoperable and entered Technical Specification LCO 3.8.1 Condition B. Following repairs and post-maintenance testing, the emergency diesel generator was declared operable and Unit 2 exited LCO 3.8.1 Condition B on January 18, 2013.

The Unit 2 train B emergency diesel generator had most recently been tested in emergency mode on October 26, 2012. The licensee issued the LER to report a condition prohibited by Technical Specifications because the voltage regulator malfunction likely existed for the allowed completion time for LCO 3.8.1 Conditions B and H.

The direct cause of the emergency diesel generator failure was the failure of an operational amplifier on the instantaneous pre-position (IPP) circuit board used to provide the voltage setpoint during operation in the emergency mode. The licensee concluded the root cause of this event an inadequate preventive maintenance strategy for relay VR2 which resulted in degraded relay contact resistance that allowed a voltage transient to be seen on the operational amplifier on the IPP board. To prevent recurrence, the licensee has initiated a new preventive maintenance strategy for emergency diesel generator voltage regulator components.

The inspectors previously dispositioned this issue as a licensee-identified violation in Section 4OA7 of inspection report 05000528;529;530/2013003. The inspectors reviewed the LER and did not identify any additional concerns. This LER is closed.

.3 (Closed) Licensee Event Report 05000528;529;530/2013-001-00, Unanalyzed Condition Due to Spent Fuel Pool Criticality Analysis of Record Not Updated for Power Uprate

On March 8, 2013, engineering personnel determined that certain impacts of the spent fuel pool criticality analysis of record had not been considered as part of the project to perform a power uprate in 2003. The power uprate impacted the reactivity of fuel discharged to the spent fuel pool, but the spent fuel pool criticality analysis of record was not revised to account for the increased fuel reactivity. The licensee issued the LER to report an unanalyzed condition.

The licensee concluded the root cause of this event was that procedures and processes lacked adequate rigor to identify impacts the spent fuel pool criticality analysis of record.

The licensee has revised design change procedures to consider reactivity impacts on the spent fuel pool and will revised the spent fuel pool criticality analysis of record using updated methodology and input parameters.

The inspectors previously dispositioned this issue as a licensee-identified violation in Section 4OA7 of inspection report 05000528;529;530/2013003. The inspectors reviewed the LER and did not identify any additional concerns. This LER is closed.

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

4OA5 Other Activities

(Closed) Unresolved Item (URI) 05000528/05000529/05000530-2010005-05, "Assess Acceptability of Change to Fire Damper Test Frequency."

In November 2009, the licensee initiated a change to the Technical Requirements Manual surveillance requirements (TSR) associated with fire dampers in Carbon Dioxide and Halon gaseous fire suppression systems (TSR 3.11.103.5 and TSR 3.11.106.5, respectively). The change to the surveillance requirements extended the functional testing frequencies for the ventilation dampers and their associated actuation devices from 18 months to 54 months. The licensee performed Engineering Evaluation 3304353 which documented the technical basis for the surveillance frequency extensions. As part of the evaluation, the licensee used guidance in Electric Power Research Institute (EPRI) Technical Report 1006756, "Fire Protection Equipment Surveillance Optimization and Maintenance Guide," as a basis for the change. The methodology in EPRI Technical Report 1006756 was intended to establish a performance-based maintenance and testing program for fire protection systems. Using the statistical analysis methods of the EPRI technical report, the licensee concluded that the change did not have a statistically significant impact on the failure rates of the damper systems, did not adversely affect the ability to achieve and maintain safe shutdown, and, therefore, could be made without the NRC approval.

This unresolved item was opened to address: (1) the acceptability of using statistical or performance-based analysis methodologies at a plant licensed under deterministic rule (10 CFR 50.48(b)) using the provisions for a self-approved change under the standard license condition and (2) the technical bases used by the licensee to conclude that the change did not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. This issue was unresolved pending review by the staff to assess whether this type of change was permitted under the standard fire protection license condition and whether the technical basis used by the licensee to support the change adversely affected the ability to achieve and maintain safe shutdown. The licensee documented this issue in CRDR 3493945.

License Condition 2.C.(7), 2.C.(6), and 2.F for Units 1, 2, and 3, respectively, allows the licensee to make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

The inspectors determined that the licensee had used industry documents, NEI documents and several existing NRC documents, including draft NUREG-1521, "Technical Review of Risk-Informed, Performance-Based Methods for Nuclear Power Plant Fire Protection Analyses," issued for comment in 1998, to support their position that the changes were allowed without prior NRC review. The inspectors contacted the Office of Nuclear Reactor Regulation (NRR) for guidance on licensee use of this draft

document and other issues related to a nuclear utility's use of a risk-informed, performance-based program to change programs at a plant licensed under deterministic rule (10 CFR 50.48(b)). Subsequently, NRR requested assistance from the Office of Nuclear Regulatory Research to provide guidance that support staff review of performance-based surveillance programs for fire protection systems and equipment, and work with industry to improve existing guidance.

The inspectors reviewed the licensee's damper surveillances performed to date and identified no physical performance deficiencies. This unresolved item is closed. The NRC is scheduled to perform a triennial inspection of the licensee's fire protection program in 2014.

40A6 Meetings, Including Exit

Exit Meeting Summary

On October 25, 2013, the inspectors presented the radiation safety inspection results to Mr. R. Bement, Vice President, Nuclear 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 December 19, 2013, the inspectors presented the inspection results of the review of inservice inspection activities to Mr. D. Mims, Senior Vice President, 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. All proprietary information was identified and returned.

The lead inspector obtained the final annual examination results and telephonically exited with Mr. S. Banks, Licensed Operator Continuing Training Section Leader, on December 30, 2013. The inspector did not review any proprietary information during this inspection.

On January 9, 2013, the inspectors presented the inspection results to Mr. D. Mims, 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.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of the NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as non-cited violations.

- .1 Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, prior to October 26, 2012, the licensee failed to have an adequate test procedure to perform safety injection check valve testing.

Specifically, the licensee identified that latent test procedure deficiencies allowed a cold leg safety injection header manual drain valve common to both emergency core cooling

system (ECCS) trains to be open without an evaluation that ECCS flow requirements would be satisfied. The licensee identified that deficiencies in previous revisions of surveillance test (ST) procedure 73ST-9SI05, "Leak Test of HPSI/LPSI Containment Isolation Check Valves," existed since 1983 and that failure to have adequate test procedures to prevent a flow diversion of the ECCS could result in a degraded condition and prevent a safety related system from performing as design. To prevent recurrence, the licensee revised the procedure to ensure the minimum required ECCS flow is available during safety injection check valve testing.

The inspectors determined that the finding represented a loss of system function and needed a detailed risk evaluation. The significance of this error was bound by using an exposure period composed of the accumulated time that this activity was performed when procedures would have allowed for this configuration. This exposure period was approximately 7 hours. The inspectors used the "Palo Verde Standardized Plant Analysis Risk (SPAR)" model, Revision 8.20, dated May 31, 2012, with a truncation limit of E-11, to perform simplified calculations. Inspectors considered one train unavailable for high pressure safety injection and only two pathways available for injection on the redundant train, as bounding assumptions for the analysis. The incremental conditional core damage probability, assuming one year of exposure, for these sequences was 3.0E-6. The change to the core damage frequency (delta-CDF) considering the 7 hour exposure period was therefore:

$$\text{delta-CDF} = 3.0\text{E-}6 * 7\text{hour}/8760 \text{ hours per year} = 2.4\text{E-}9/\text{year}$$

Since the change to the core damage frequency was less than 1.0E-7/year, the inspectors were not required to consider the contribution from external events or calculate the change to the large early release frequency. Since the calculated delta CDF was less than 1E-6, and the large early release frequency was not a significant contributor, the finding was of very low safety significance (Green). A Region IV senior reactor analyst reviewed the results and agreed with the conclusion. The licensee entered the issue into the corrective action program as PVAR 4430283.

- .2 Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on August 29, 2013, operations personnel failed to accomplish an activity affecting quality in accordance with procedures.

Specifically, the operations personnel did not have a technical basis for declaring the essential spray pond system operable when it was not in a seismic configuration analyzed in the current licensing basis. Removal of a spray pond piping spool piece during planned maintenance on Unit 3 emergency diesel generator A resulted in the inoperable spray pond train. The inspectors evaluated the significance of the issue under the Significance Determination Process, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at-Power." Inspectors concluded the finding was of very low safety significance (Green) because all questions in Exhibit 2 could be answered no. The licensee entered the issue into the corrective action program as PVAR 4450413.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

N. Aaronscooke, Engineer, Regulatory Affairs
J. Allison, Licensed Operator Initial Training Section Leader
P. Anderson, Engineer, Program Engineering
G. Andrews, Manager, Operations Support
D. Arbuckle, Manager, Operations
S. Banks, Licensed Operator Continuing Training Section Leader
R. Barnes, Director, Regulatory Affairs
A. Bassett, Engineer, System Engineering
R. Bement, Senior Vice President, Site Operations
B. Berryman, Plant Manager, Plant Operations
R. Bethke, Department Leader, Emergency Preparedness
J. Bettencourt, Technical Advisor, Radiation Protection
W. Blaxton, Radiation Monitoring Technician, Radiation Protection
M. Brannin, Senior Engineer, Program Engineering
J. Bungard, Supervisor, Radiological Engineering
L. Burton, Examination Developer
J. Cadogan, Vice President, Nuclear Engineering
J. Cox, Engineer, Program Engineering
M. Debolt, Team Leader, Nuclear Maintenance
E. Dutton, Director, Nuclear Assurance Department
E. Fernandez, Senior Engineer
R. Folley, Engineer, Engineer Inspections
K. Foster, Department Leader, Fire Department
T. Gray, Department Leader, Radiation Protection
D. Hansen, Senior Consultant Engineer
D. Hautala, Senior Consultant, Regulatory Affairs
D. Heckman, Senior Consultant, Regulatory Affairs
K. House, Director, Nuclear Design Engineering
D. Jennings, Supervisor, Radiation Protection
G. Jones, Team Leader, Radiation Protection
E. Kirkland, Program Advisor, Maintenance
A. Krainik, Department Leader Nuclear Engineering, Operations
M. Laca, Vice President, Operations Support
S. Lantz, Section Leader, Radiation Protection Technical Services
W. Leaverton, Engineer, System Engineering
J. McDonnell, Department Leader, Radiation Protection
M. McGhee, Manager, Regulatory Affairs
M. McLaughlin, Director, Technical Services
P. McSpaman, Director, Nuclear Training
G. Michael, Licensing
D. Mims, Senior Vice President, Regulatory and Oversight

T. Mitchell, Component Engineer, Engineering
 T. Mock, Director, Operations
 C. Moeller, Manager, Radiation Protection
 N. Nelson, Senior Technician, Radiation Protection
 F. Oreshack, Consultant, Regulatory Affairs
 S. Pobst, Section Leader, Engineering
 F. Puleo, Peer Evaluator, STARS/South Texas Project
 M. Radspinner, Department Leader, System Engineering
 M. Ray, Director, Emergency Preparedness/Security
 R. Routolo, Operations Department Leader, Radiation Services
 K. Schrecker, Section Leader, Engineering Programs
 M. Shea, Director, Safety Culture
 R. Sims, Instrumentation Technician, Radiation Protection
 R. Stroud, Licensing Section Leader
 C. Tubman, Section Leader, Radiation Protection Operations
 D. Van Allen, Engineer, Engineering Inspections
 M. Wagner, Unit 1 Section Leader, Radiation Protection Operations
 T. Weber, Department Leader, Regulatory Affairs
 D. Wheeler, Department Leader, Performance Improvement
 R. Witzak, Operations Superintendent, Radiation Protection

NRC Personnel

R. Hall, Senior Project Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000528;529;530/ 2013005-01	NCV	Inadequate Modification of Safety Related Accumulators (Section 1R18)
05000529/2013005- 02	FIN	Failure to Replace Oil Soaked Insulation Results in a Fire (Section 40A2)

Closed

05000528;529;530/ 2012-006-00	LER	Safety Injection System Check Valve Testing Could have Resulted in Less than Required Injection Flow (Section 40A3)
05000528;529;530/ 2013-001-00	LER	Unanalyzed Condition Due to Spent Fuel Pool Criticality Analysis of Record Not Updated for Power Uprate (Section 40A3)
05000529/2013- 001-00;-01	LER	Condition Prohibited by Technical Specifications due to Emergency Diesel Generator Low Output Voltage (Section 40A3)
05000528;529;530/ 2010-005-05	URI	Assess Acceptability of Change to Fire Damper Test Frequency (Section 40A5)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40AO-9ZZ21	Acts of Nature	31
01DP-0XX01	Control and Monitoring of Potential Tornado Borne Missiles	3

Palo Verde Action Requests

4466359 4464214

Section 1R04: Equipment Alignment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40OP-9EW02	Essential Cooling Water System train B	18
40ST-9SI13	LPSI and CS System Alignment Verification	28
40OP-9PC01	Fuel Pool Cooling	12
40OP-9SI13	LPSI and CS System Alignment Verification	28

Condition Reports (CRs)

3614719

Palo Verde Action Requests

4285944	3676180	4475823	3580292	4366459
4420200	4440510	4436086	4430472	

Work Order

4440740

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u> <u>Date</u>
Calculation 13- MC-PC-0217	Heat Transfer Evaluation	5
PHX-1031	Calculation Report for PV PC – PV PC Heat Exchanger	October 1, 2013

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u> <u>Date</u>
--	3R17 Spent Fuel Pool Cooling Plan	

Section 1R05: Fire Protection

Palo Verde Action Request

4304524

Section 1R06: Flood Protection Measures

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73DP-9XI05	Check valve Condition Monitoring Program	8

Palo Verde Action Requests

4478076 4471804

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13-MC-ZA-0808	MSSS 81' Flooding Calculation	6

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	58
40OP-9ZZ07	Plant Shutdown Modes 1 to 3	37
40OP-9zz23	Outage GOP	65

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Licensed Operator Continuing Training Simulator Scenario	November 19, 2013
	Annual Operating Test Results	December 30, 2013

Section 1R12: Maintenance EffectivenessProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
70DP-0MR01	Maintenance Rule	34

Condition Reports (CRs)

4446187	4446188	3674945
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Palo Verde Action Requests

4260912	4179802	4341323	4466299	4462579
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Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Periodic (a)(3) Assessment of the PVNGS Maintenance Rule Program for the period July 2011 through December 2012 Conducted March through June 2013	
	MRule Function Scoping PB-01 Class 1E 4.16KV Power	November 18, 2013
	Performance Criteria Formulation Basis PB System	1
MTG-PVNGS-2013-00982	Expert panel meeting	November 22, 2013

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9RS02	Shutdown Risk Management	1
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 & 2	20
02DP-9RS01	Operational Risk Management	1
30DP-9MP11	Field Use of Rigging	33
30DP-9MP10	Mobile Crane Operations	19
40DP-9ZZ17	Control of Doors, Hatches, and Floor Plugs	53
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	19

Condition Reports (CRs)

4456338 4448301

Palo Verde Action Requests

4480595	4480682	4480598	4480597	448059
4480592	4485144	4480686	4471493	4455502
4481404	4463624	4479610	4471804	4478076

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
	Shutdown Safety Function Assessment	December 3, 2013
	BMI – Development and Repair Plan	1
	Crane Operator Pre-Job Brief and Two-Minute Drill Checklists	August 23, 2013
Policy Guide 1300-03	Sensitive Issues Manual	6
	U3R17 Shutdown Risk Assessment Final Report	September 27, 2013
	Shutdown Safety Function Assessment	October 9, 2013

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9OP26	Operations PVAR Processing and Operability Determination/Functional Assessment	35

Palo Verde Action Requests

4466875 4462597

Work Order

4466882

Section 1R18: Plant Modifications

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9DG08	Class 1E Diesel Generator Load Rejection, 24 Hour Rated Load and Hot Start Test Train B	6
40ST-9DG02	Diesel Generator B Test	47
93DP-0LC07	10CFR50.59 and 72.48 Screenings and Evaluations	24a

Palo Verde Action Requests

4439904	4486543	4443025	4429273
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Condition Reports (CRs)

4440737	4438235	3776459
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Work Orders

3020924	2912120	4136842	2859190	4453144
4453887	3219812			

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Temporary Approved Procedure Action – 40AL-9PC01	October 3, 2013
	Temporary Approved Procedure Action – 40AL-9RK7B	October 23, 2013
	Temporary Approved Procedure Action – 40OP-9PC01	October 2, 2013
	Temporary Approved Procedure Action – 40OP-9PC05	October 18, 2013
S-09-0220	50.59 Screen	0

Section 1R19: Post-Maintenance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
32MT-9ZZ82	Time Delay Relay Test	19

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9DG08	Class 1E Diesel Generator Load Rejection, 24 Hour Rated Load and Hot Start Test Train B	6
40ST-9DG02	Diesel Generator B Test	47
32MT-9ZZ84	AC Motor Operational Testing	26

Palo Verde Action Requests

4480592	4485144	4480686	4439904	4467780
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Work Orders

4233002	3020924	2912120	4440737	4136842
3492148	4198410	4469490	4467806	4468369
2546289	4197883			

Section 1R20: Refueling and Other Outage Activities

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40OP-9PC01	Fuel Pool Cooling	12
78OP-9FX01	Refueling Machine Operations	48
40AO-9Z23	Loss of SFP Level or Cooling	20
40OP-9PC07	Refueling Pool Operations	60
40DP-9RS02	Shutdown Risk Management	1
40DP-9OP29	Power Block Clearance and Tagging	52
40DP-9OP09	System Status Control	52

Palo Verde Action Requests

4467995	4468701	4467972	4463829	4463628
4465396	4463979	4478136	4478248	4472461
4475728	4475660	4475577	4475591	4475768
4475681	4463838			

Condition Reports (CRs)

4461990

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	U3R17 Shutdown Risk Assessment Final Report	September 27, 2013

Section 1R22: Surveillance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9AF03	AFB-P01 Recirc Flow – Inservice Test	23
73ST-9CL01	Containment Leakage Type “B” and “C” Testing	39
73ST-9DG02	Class 1E Diesel Generator and Integrated Safeguards Test Train B	25
73ST-9AF03	AFB-P01 Recirc Flow – Inservice Test	23

Condition Reports (CRs)

4466135 4466135

Palo Verde Action Requests

4464247 4462453 4463883

Work Orders

4190229 4464336 4161195 4463892 4463891

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EP-0901	“Classifications”	03-04

Section 1EP6: Drill Evaluation

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
	4 th Quarter ERO Tabletop PI Scenario	December 17, 2013
	PVNGS ERO Critique Conduct Guidelines	0
	Emergency Plan	50

Section 2RS01: Radiological Hazard Assessment and Exposure Controls

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
75DP-0RP01	RP Program Overview	10
75DP-0RP02	Radioactive Contamination Control	19
75DP-9RP01	Radiation Exposure and Access Control	20
75RP-0RP01	Radiological Posting and Labeling	30
75RP-9OP02	Control of High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas	25
75RP-9RP07	Radiological Surveys and Air Sampling	23
75RP-9RP26	Radioactive Source Control	14

Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
SWMS 4098386	Simple Self-Assessment "Managing Radiological Risk"	April 2, 2012
SWMS 4279669	Control of Radioactive Material	March 30, 2013
SWMS 4279739	Radiation Protection Technical Training	June 21, 2013
2012-009	NAD Audit Report – Radiation Protection	September 14, 2012

Radiological Survey Maps

<u>Number</u>	<u>Title</u>	<u>Date</u>
1-M-20130719-3	Dose Gradient RO-2A Data vs. Telepole FHZ612	October 24, 2013

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1-M-20130926-8	Unit-1 R140 Neutron Source Room Radwaste	September 26, 2013
3-M-20130924-1	Unit-3 R140 Neutron Source Room Radwaste	September 24, 2013
2-M-20130925-1	Unit-2 R140 Neutron Source Room Radwaste	September 25, 2013
1-M-20130718-5	Quarterly 120 E / W Purification Pipe Chase	July 18, 2013
1-M-20130719-2	Posting New LHRA 120' Purification Pipe Case West End	July 19, 2013

Palo Verde Action Requests

4417470	4402432	4398803	4384992	4387902
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Condition Reports (CRs)

4437463	4418357	4402346	4402345	4385482
4280849	4286002	4213998	4257743	4177316
4167238	4132035			

Radiation Exposure Permits

<u>Number</u>	<u>Title</u>	<u>Revision</u>
REP-3-3002	Reactor Destack/Restack	
REP-3-3501	RP Tours, Inspections, and Routine Surveys	0
REP 3-3502	Valve Maintenance	
REP 3-3503	HRA – General Tours, Inspections, and Job Planning Walkdowns	0

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	U3R17 Refueling Outage	October 28, 2013
	Radioactive Source Inventory: Units 1, 2, and 3 (SourceTRAX)	February 28, 2013

Section 2RS02: Occupational ALARA Planning and Controls

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
75DP-0RP03	ALARA Program Overview	5
75DP-0RP06	ALARA Committee	6
75DP-0RP08	Managing Radiological Risk	0
75RP-9RP02	Radiation Exposure Permits	28
75RP-9RP12	ALARA Reports	5
75TD-9RP02	ALARA Work Planning	5

Alara Plans and Post Job Reports

<u>Number</u>	<u>Title</u>	<u>Date</u>
1-1502	ALARA Plan, Revision 2	April 8, 2013
1-3306	ALARA Plan, Revision 1	March 26, 2013
1-3502	ALARA Plan, Revision 3	March 15, 2013
1-1502	ALARA Post Job Review	May 15, 2013
1-3306	ALARA Post Job Review	May 14, 2013
1-3502	ALARA Post Job Review	June 11, 2013
1-3516	ALARA Post Job Review	June 14, 2013

Radiation Exposure Permits

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1-1502	Rework 1JSIAUV0651 And Perform Pressure Locking Mods	2
1-3306	Primary Side Steam Generator Maintenance	1
1-3502	Valve, Flange, And Pump Maintenance And Inspection	3

Palo Verde Action Requests

4166710	4384502	4398803
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Condition Reports (CRs)

4146251	4167238	4209776	4213998	4233742
4280818	4348175	4386252		

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
SWMS 4098386	Simple Self-Assessment "Managing Radiological Risk"	April 2, 2012
	ALARA 1R17 Outage Report	August 25, 2013
	Radiological Trends	August 31, 2013
	ALARA 5 Year Plan 2013 - 2017	March 20, 2013
	ALARA Committee Meeting	December 7, 2012
	ALARA Committee Meeting	January 30, 2013
	ALARA Committee Meeting	March 22, 2013
	ALARA Committee Meeting	May 22, 2013
	ALARA Committee Meeting	September 13, 2013

Section 40A1: Performance Indicator Verification

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
75RP-0LC01	Performance Indicator Occupational Radiation Safety Cornerstone Performance Indicator Public Radiation Safety Cornerstone	3
75RP-0LC02	Performance Indicator Public Radiation Safety Cornerstone	2
71DP-0AP01	Mitigating System Performance Index Program	1

Condition Reports (CRs)

4437464

Section 40A2: Problem Identification and Resolution

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Operator Work Arounds Report	November 19, 2013
	Operator Burdens Report	November 19, 2013

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	PVNGS Monthly Trend Reviews – June 2013 through November 2013	
NEI 99-02	Regulatory Assessment Performance Guideline	
	Cooling Water (CW) Mitigating System Performance Indicator (MSPI) Margins 3 rd Qtr 2013	
	HPSI and RHR Mitigating System Performance Indicator (MSPI) Margins 3 rd Qtr 2013	
	OP6 – EDG and AFW Mitigating System Performance Indicator (MSPI) Margins 3 rd Qtr 2013	

Condition Reports (CRs)

4452395 4458504 4440196

Section 40A5: Other Activities

Condition Reports (CRs)

3493945

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
09-R003	Licensing Document Change Request to Revise TRM Surveillance Requirements for Fire Damper Testing	November 2, 2009
TRM 3.11.103	CO ₂ Systems	September 24, 1999
TRM 3.11.106	Halon Systems	September 24, 1999
TRM 3.11.103	CO ₂ Systems	November 6, 2009
TRM 3.11.106	Halon Systems	November 6, 2009
TRM 6.0.100	TRM Specification Bases	February 26, 2009
LDCR 09-R003 FPCRR	Fire Protection Change Regulatory Review	November 1, 2009

3304353	Engineering Evaluation	
NUREG 0857	Safety Evaluation Report Related to the Operation of Palo Verde Nuclear Generating Station: Units 1, 2, and 3	November 1981
UFSAR APPENDIX 9B	Fire Protection Evaluation Report	June 2007
UFSAR 9.5.1	Fire Protection System	June 2007
NFPA-12	Carbon Dioxide Extinguishing Systems	1973
NFPA-12A	Halogenated Fire Extinguishing Agent Systems – Halon 1301	1973
	Pre-Fire Strategies Manual	24

**The following items are requested for the
Radiation Safety Inspection
at Palo Verde Nuclear Generating Station
October 21-25, 2013
Integrated Report 2013005**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before September 9, 2013.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1-A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact either Larry Ricketson or John O'Donnell at (817) 200-1165 or (817) 200-1441. E-mail addresses: Louis.Carson@nrc.gov or John.Odonnell@nrc.gov.

PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

1. Radiological Hazard Assessment and Exposure Controls (71124.01)

Date of Last Inspection: April 9, 2012

- A. List of contacts and telephone numbers for the Radiation Protection Organization Staff and Technicians
 - B. Applicable organization charts
 - C. Audits, self assessments, and LERs written since date of last inspection, related to this inspection area
 - D. Procedure indexes for the radiation protection procedures
 - E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
 - 1. Radiation Protection Program Description
 - 2. Radiation Protection Conduct of Operations
 - 3. Personnel Dosimetry Program
 - 4. Posting of Radiological Areas
 - 5. High Radiation Area Controls
 - 6. RCA Access Controls and Radworker Instructions
 - 7. Conduct of Radiological Surveys
 - 8. Radioactive Source Inventory and Control
 - 9. Declared Pregnant Worker Program
 - F. List of corrective action documents (including corporate and subtiered systems) since date of last inspection
 - a. Initiated by the radiation protection organization
 - b. Assigned to the radiation protection organization
- NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable" so that the inspector can perform word searches.
- If not covered above, a summary of corrective action documents since date of last inspection involving unmonitored releases, unplanned releases, or releases in which any dose limit or administrative dose limit was exceeded (for Public Radiation Safety Performance Indicator verification in accordance with IP 71151)
- G. List of radiologically significant work activities scheduled to be conducted during the inspection period (If the inspection is scheduled during an outage, please also include a list of work activities greater than 1 rem, scheduled during the outage with the dose estimate for the work activity.)
 - H. List of active radiation work permits
 - I. Radioactive source inventory list

2. Occupational ALARA Planning and Controls (71124.02)

Date of Last Inspection: November 26, 2012

- A. List of contacts and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA Program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
 - 1. ALARA Program
 - 2. ALARA Committee
 - 3. Radiation Work Permit Preparation
- F. ~~A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates~~
This item is covered by 1F.
NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable."
- G. List of work activities greater than 1 rem, since date of last inspection. Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)
- I. Outline of source term reduction strategy