



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

February 8, 2016

EA-15-158

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

**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED
INSPECTION REPORT 05000528/2015004, 05000529/2015004, and
05000530/2015004**

Dear Mr. Edington:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station Units 1, 2, and 3. On January 7, 2015, the NRC inspectors discussed the results of this inspection with Mr. R. Bement and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

In this report, NRC inspectors documented one licensee-identified violation which was determined to be of very low safety significance and one licensee-identified Severity Level IV violation. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC 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.

The inspectors also reviewed Licensee Event Report 05000530/2015-001-00 which reported a condition prohibited by technical specifications resulting from a leak in the reactor coolant pressure boundary on a Unit 3 reactor coolant pump 2A suction pipe instrument nozzle. The pressure boundary leakage was discovered while the unit was shut down for a refueling outage as licensee personnel performed a scheduled boric acid walk-down inspection of the Unit 3 reactor coolant system. The cause of the leak was determined to be primary water stress corrosion cracking of the alloy 600 instrument nozzle. The licensee corrected the condition by performing a half nozzle repair and obtained a relief request from the NRC for one cycle of operation. Inspectors concluded that it was not reasonable for Palo Verde Nuclear Generating Station staff to foresee and correct this condition prior to the discovery of the leak, and,

R. Edington

- 2 -

therefore, did not identify an associated performance deficiency. The NRC determined that this issue was of very low safety significance. Based on these facts, I have been authorized, in consultation with the Director, Office of Enforcement, and the Regional Administrator, Region IV to exercise enforcement discretion in accordance with NRC Enforcement Policy Section 3.5. "Violations Involving Special Circumstances," and refrain from issuing enforcement for this violation.

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 Ryan Lantz Acting for/

Troy W. Pruett
Director,
Division of Reactor Projects

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

Enclosures:

Inspection Report 05000528/2015004,
05000529/2015004, 05000530/2015004
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Docket Nos. 50 528, 50 529, 50 530
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OFFICIAL RECORD COPY

Letter to R. Edington from T. Pruett dated February 8, 2016

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED
INSPECTION REPORT 05000528/2015004, 05000529/2015004, AND
05000530/2015004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000528, 05000529, 05000530

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

Report: 05000528/2015004, 05000529/2015004, 05000530/2015004

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station

Location: 5801 South Wintersburg Road
Tonopah, AZ 85354

Dates: October 1 through December 31, 2015

Inspectors: C. Peabody, Senior Resident Inspector
D. Reinert, PhD, Resident Inspector
D. You, Resident Inspector
L. Carson, Senior. Health Physicist
P. Elkmann, Senior Emergency Preparedness Inspector
J. Kirkland, Senior Operations Engineer
J. Braisted, Reactor Inspector
L. Brandt, Project Engineer
M. Brooks, Physical Security Inspector
C. Cowdrey, Operations Engineer
G. Guerra, CHP, Emergency Preparedness Inspector
P. Jayroe, Reactor Inspector
J. Melfi, Project Engineer
N. Okonkwo, Reactor Inspector
C. Smith, Reactor Inspector

Approved By: Ryan E. Lantz, Acting for
Troy W. Pruet, Director
Division of Reactor Projects

SUMMARY

IR 05000528, 529, 530/2015004; 10/01/2015 – 12/31/2015; (Palo Verde Nuclear Generating Station) Follow-up of Events and Notices of Enforcement Discretion.

The inspection activities described in this report were performed between October 1 and December 31, 2015, by the resident inspectors at Palo Verde Nuclear Generating Station and inspectors from the NRC's Region IV office and other NRC offices. NRC inspectors documented in this report one licensee-identified violation of very low safety significance and one licensee-identified Severity Level IV violation. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Licensee-Identified Violations

One violation of very low safety significance (Green) and one violation of Severity Level IV were identified by the licensee and 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 operated at full power for the duration of the inspection period.

Unit 2 entered the inspection period at full power and was shutdown for refueling on October 10, 2015. Unit 2 restarted from their refueling outage on November 14, 2015, and returned to full power. On November 27-28, 2015, power was reduced to 83 percent following the failure of a heater drain pump discharge valve. Unit 2 operated at full power for the remainder of the inspection period.

Unit 3 operated at full power for the duration of the inspection period.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- October 27, 2015, Unit 2 spent fuel cooling system trains A and B
- November 17, 2015, Unit 1 containment spray train A
- December 22, 2015, Unit 2 "A" emergency diesel generator during electrical breaker testing for the "B" emergency diesel generator

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 November 19, 2015, the inspectors performed a complete system walk-down inspection of the Unit 2 containment purge 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)

.1 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 21, 2015, Unit 3 main control room, Fire Zone 17
- November 2, 2015, Unit 1 4kV switchgear room train A, Fire Zone 5A
- November 17, 2015, Unit 3 auxiliary feedwater pump rooms, Fire Zone 72 and 73
- November 18, 2015, Unit 2 class battery rooms train A and C, Fire Zone 8A and 9A

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

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

b. Findings

No findings were identified.

.2 Annual Inspection

a. Inspection Scope

On November 17, 2015, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of an unannounced fire drill for quarterly proficiency on November 16, 2015.

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

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

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On October 16, 2015, 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 a plant area containing risk-significant structures, systems, and components that were susceptible to flooding:

- Units 1, 2, and 3 emergency diesel generator 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.

These activities constitute completion of one flood protection measures sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed licensee programs to verify heat exchanger performance and operability for the following heat exchangers:

- Unit 1 shutdown cooling heat exchanger train B
- Unit 1 spray pond heat sink train A
- Unit 2 diesel jacket water heat exchanger train A

- Unit 3 essential cooling water heat exchanger train A

The inspectors verified whether testing, inspection, maintenance, and chemistry control programs are adequate to ensure proper heat transfer. The inspectors verified that the periodic testing and monitoring methods, as outlined in commitments to NRC Generic Letter 89-13, utilized proper industry heat exchanger guidance. Additionally, the inspectors verified that the licensee's chemistry program ensured that biological fouling was properly controlled between tests. The inspectors reviewed previous maintenance records of the heat exchangers to verify that the licensee's heat exchanger inspections adequately addressed structural integrity and cleanliness of their tubes. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four triennial heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

Sections .1 through .5, below constitute completion of one sample as defined in Inspection Procedure 71111.08

.1 Non-destructive Examination (NDE) Activities and Welding Activities

a. Inspection Scope

The inspectors observed six nondestructive examination activities and reviewed 10 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:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Safety Injection	Pipe to Elbow, 2-022-014	Dye Penetrant
Reactor Vessel	Bottom Mounted Instrumentation Nozzles (1-61)	Visual
Safety Injection	2PSIEL176, Report 15-1089	Radiography
Safety Injection	2PSIEL176, Report 15-1090	Radiography
Steam Generator	15-MT-2013, 2-065-017	Magnetic Particle
Reactor Vessel	Reactor Vessel Upper Head nozzles 1 – 97	Visual

The inspectors reviewed records for the following nondestructive examinations:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Steam Generator	15-UTE-2052, Nozzle to Vessel	Ultrasonic
Steam Generator	15-UTE-2053, Nozzle to Vessel	Ultrasonic
Steam Generator	15-UTE-2054, Nozzle to Vessel Inner Radius	Ultrasonic
Steam Generator	15-UTE-2055, Nozzle to Vessel Inner Radius	Ultrasonic
Steam Generator	15-UTE-2058, Tubesheet to Head	Ultrasonic
Safety Injection	VE-15-003, 1A Safety Injection	Phased Array Ultrasonic
Safety Injection	VE-15-004, 1B Safety Injection	Phased Array Ultrasonic
Safety Injection	VE-15-005, 2A Safety Injection	Phased Array Ultrasonic
Safety Injection	VE-15-006, 2B Safety Injection	Phased Array Ultrasonic
Reactor Coolant	15-1008 2A RCP Suction Instrumentation Nozzle	Bare Metal Visual

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 directly observed a portion of the following welding activities:

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Instrument Air	4201037-1 and 4201037-2	shielded-metal arc weld
Flex Mod to RCS	4418137-30	gas-tungsten arc weld

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.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

No vessel upper head inspection was required during this refueling outage, however, the licensee identified boric acid on top of the reactor vessel head, dripping down from a graylock-hub connection associated with the heated junction thermocouple train B. The inspectors reviewed the results of the licensee's bare metal visual inspection of the reactor vessel upper head penetrations to determine whether the licensee identified any evidence of boric acid challenging the structural integrity of the reactor head components and attachments. The inspectors also verified that the required inspection coverage was achieved and limitations were properly recorded.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities

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 7, and Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 18. 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.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

No eddy current inspections were required or planned for refueling outage U2R19. However, due to previous concerns with foreign objects in the steam generators, the licensee initiated Foreign Object Search and Retrieval (FOSAR) inspections on both Steam Generators. The licensee defines a classification system for foreign objects to determine where retrieval efforts should be applied if foreign material is discovered in the steam generator. Category 1 items are foreign objects that experience or analysis could be expected to cause tube wear to exceed 50 percent through wall in one or two operating cycles. 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).

The FOSAR inspection results for Category I items were as follows:

- One foreign object in Steam Generator 21, which was removed.
- Two items were identified as foreign objects in Steam Generator 22, both of which were removed.

The licensee determined, due to lack of object wear marks found on either the foreign objects or on tubes in the vicinity of the removed objects, that no eddy current examinations were required. Other foreign objects identified in the steam generators are not expected to cause tube damage.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems

a. Inspection scope

The inspectors reviewed 18 condition reports which dealt with inservice inspection activities and found the corrective actions were appropriate. From this review the inspectors concluded that the licensee has an appropriate threshold for entering issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The inspectors also determined the licensee had an effective program for applying industry operating experience. Specific documents reviewed during this inspection are listed in the attachment.

b. Findings

No findings were identified.

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

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On November 23, 2015, the inspectors observed a portion of an annual requalification test for licensed operators. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

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

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity. The inspectors observed the operators' performance of the following activities:

- October 9, 2015, Unit 2 shutdown for planned refueling outage
- November 9, 2015, Unit 2 notice of unusual event for a fire alarm in containment

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

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

b. Findings

No findings were identified.

.3 Annual Review of Requalification Examination Results

a. Inspection Scope

The inspector conducted an in-office review of the annual requalification training program to determine the results of this program.

On December 18, 2015, the licensee informed the inspector of the following Palo Verde Units 1, 2, and 3 operating test results:

- 21 of 21 crews passed the simulator portion of the operating test
- 109 of 109 licensed operators passed the simulator portion of the operating test
- 109 of 109 licensed operators passed the job performance measure (JPM) portion of the operating test
- One reactor operator and one senior reactor operator have not yet been tested due to short term disabilities and will be tested separately prior to returning to licensed duties

No remediation was performed for any operating examination.

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

b. Findings

No findings were identified.

.4 Biennial Review of Requalification Program

a. Inspection Scope

Every year, either an annual review or a biennial review is performed on the licensed operator requalification program. For this year, an annual review was completed and the biennial review was not performed. See the Annual Review Section for details on the 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):

- December 11, 2015, Unit 2 containment airlock, extended a(1) monitoring due to additional test failures
- December 10, 2015, Non-class 1E 480V, a(2) routine monitoring

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 two 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 16, 2015, Unit 2 night shift shutdown safety function assessment yellow risk management action levels for reactivity control and spent fuel pool decay heat removal
- October 19, 2015, Unit 3 online weekly risk assessment
- October 28, 2015, Unit 2 day shift shutdown safety function assessment for the reactor vessel head removed and reactor coolant system above reactor vessel flange

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.

These activities constitute completion of three maintenance risk assessment 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 seven operability determinations that the licensee performed for degraded or nonconforming structures, systems, or components (SSCs):

- October 15, 2015, Unit 2 operability determination of vital electrical busses during essential ventilation outage

- October 21, 2015, Unit 3 operability determination of containment sump water level (wide range) train A following a change in water level trends
- November 13, 2015, Unit 3 operator work around for spent fuel pool local temperature alarm failure
- November 23, 2015, Unit 2 operator work around for two low pressurizer pressure setpoint reset switch not lowering pressure when operated
- December 9, 2015, Unit 3 operability determination of safety injection tank 2A fill and drain valve failure to meet stroke time criteria
- December 10, 2015, Unit 1, 2, and 3 operability determination of reactor coolant system piping loads due to updated analysis in support of next generation fuel
- December 22, 2015, Unit 2 operability determination for containment spray pump motor space heater failing to energize

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.

The inspectors reviewed operator actions taken or planned to compensate for degraded or nonconforming conditions. The inspectors verified that the licensee effectively managed these operator workarounds to prevent adverse effects on the function of mitigating systems and to minimize their impact on the operators' ability to implement abnormal and emergency operating procedures.

These activities constitute completion of seven operability and functionality review samples, which included two operator work-around samples, as defined in Inspection Procedure 71111.15

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

Temporary Modifications

a. Inspection Scope

On October 31, 2015, the inspectors reviewed a temporary modification to the Unit 2 refueling machine to support removal of a damaged fuel assembly.

The inspectors verified that the licensee had installed and removed 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.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- October 20, 2015, Unit 2 essential spray pond train B pump post maintenance test following cable replacement
- October 24, 2015, Unit 2 containment sump isolation train B valve SIB-UV-675 post maintenance test following valve actuator refurbishment
- November 23, 2015, Unit 2 channel C log power post maintenance test following repair and troubleshooting of the channel failing low
- December 10, 2015, Station blackout generator 1 post maintenance test after planned maintenance

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 four 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 2 refueling outage that concluded on November 14, 2015, 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
- Review and verification of the licensee's fatigue management activities
- 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, as defined in Inspection Procedure 71111.20

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed three 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:

Containment isolation valve surveillance tests:

- October 26, 2015, Unit 2 containment penetration 9 leak test
- November 10, 2011, Unit 2 containment integrated leak rate test

Other surveillance tests:

- December 11, 2015, Unit 2 control element assembly operability 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 three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

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

a. Inspection Scope

The inspectors performed in-office reviews of Palo Verde Nuclear Generating Station Emergency Plan, Revision 55, and Procedure EP-0905, "Protective Actions," Revision 7; and an on-site review of changes to Procedure EP-0900, "Emergency Response Organization Position Checklists," Revision 12. These revisions:

- deleted a shelter-in-place protective action recommendation within a two mile radius of the plant at a site area emergency classification;
- provided additional details about conducting sweeps in the owner-controlled-area as part of the evacuation of non-essential personnel from site;
- specified the liaisons dispatched to an Incident Command Post when one is established;
- provided additional details about how to call out the emergency response organization to alternate emergency response facilities;
- provided guidance to contact the Buckeye, Arizona, police department to provide security at the Emergency Operations Facility/Joint Information Center; and
- made other administrative changes.

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the standards in 10 CFR 50.47(b) to determine if the revision adequately implemented the requirements of 10 CFR 50.54(q)(3) and 50.54(q)(4). The inspectors verified that the revisions did not reduce the effectiveness of the emergency plan. This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

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

b. Findings

No findings were identified.

1EP7 Exercise Evaluation – Hostile Action Event (71114.07)

a. Inspection Scope

The inspectors observed the September 16, 2015, biennial emergency plan exercise to verify the exercise acceptably tested the major elements of the emergency plan, provided opportunities for the emergency response organization to demonstrate key

skills and functions, and demonstrated the licensee's ability to coordinate with offsite emergency responders. The scenario simulated:

- an explosion at the security owner controller access checkpoint;
- an armed land-based attack against the protected area;
- explosives placed at the station blackout generators;
- a complete loss of offsite power to the station;
- a Unit 1 diesel generator failure; and
- injured and deceased plant employees.

The simulations were performed to demonstrate the licensee's capability to implement its emergency plan under conditions of uncertain physical security.

During the exercise the inspectors observed activities in the Control Room Simulator and the following emergency response facilities:

- Alternate Technical Support Center
- Alternate Operations Support Center
- Emergency Operations Facility
- Central Alarm Station
- Incident Command Post
- Joint Information Center

The inspectors focused their evaluation of the licensee's performance on event classification, offsite notification, recognition of offsite dose consequences, development of protective action recommendations, staffing of alternate emergency response facilities, and the coordination between the licensee and offsite agencies to ensure reactor safety under conditions of uncertain physical security.

The inspectors also assessed recognition of, and response to, abnormal and emergency plant conditions, the transfer of decision-making authority and emergency function responsibilities between facilities, onsite and offsite communications, protection of plant employees and emergency workers in an uncertain physical security environment, emergency repair evaluation and capability, and the overall implementation of the emergency plan to protect public health and safety and the environment. The inspectors reviewed the current revision of the facility emergency plan, emergency plan implementing procedures associated with operation of the licensee's primary and alternate emergency response facilities, and procedures for the performance of associated emergency and security functions.

The inspectors attended the post-exercise critiques in each emergency response facility to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management. The specific documents reviewed during this inspection are listed in the attachment.

The inspectors reviewed the scenarios of the 2011 and 2013 biennial exercises and the scenarios of licensee drills conducted between January 2013 and August 2015 to determine whether the September 16, 2015, exercise was independent and avoided participant preconditioning, in accordance with the requirements of 10 CFR 50, Appendix E, IV.F(2)(g). The inspectors also compared observed exercise performance with corrective action program entries and after-action reports for drills and exercises conducted January 2013 and August 2015 to determine whether identified weaknesses had been corrected in accordance with the requirements of 10 CFR 50.47(b)(14), and 10 CFR 50, Appendix E, IV.F.

These activities constituted completion of one exercise evaluation sample as defined in Inspection Procedure 71114.07.

b. Findings

No findings were identified.

1EP8 Exercise Evaluation – Scenario Review (71114.08)

a. Inspection Scope

The licensee submitted the preliminary exercise scenario for the September 16, 2015, biennial exercise to the NRC on December 18, 2014, in accordance with the requirements of 10 CFR 50, Appendix E, IV.F(2)(b). The biennial exercise had been rescheduled from March 4, 2015. The inspectors performed an in-office review of the proposed scenario to determine whether it would acceptably test the major elements of the licensee's emergency plan and provide opportunities for the emergency response organization to demonstrate key skills and functions.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the radiation monitoring equipment used by the licensee: (1) to monitor areas, materials, and workers to ensure a radiologically safe work environment, and (2) to detect and quantify radioactive process streams and effluent releases. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- Selected plant configurations and alignments of process, postaccident, and effluent monitors with descriptions in the Final Safety Analysis Report and the offsite dose calculation manual
- Selected instrumentation, including effluent monitoring instrument, portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors to examine their configurations and source checks
- Calibration and testing of process and effluent monitors, laboratory instrumentation, whole body counters, postaccident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors
- Audits, self-assessments, and corrective action documents related to radiation monitoring instrumentation since the last inspection

These activities constitute completion of one sample of radiation monitoring instrumentation as defined in Inspection Procedure 71124.05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

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 October 1, 2014 through September 30, 2015, 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 constituted verification of the mitigating system performance index for heat removal systems for Units 1, 2, and 3, as defined in Inspection Procedure 71151.

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 October 1, 2014 through September 30, 2015 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 constituted verification of the mitigating system performance index for residual heat removal systems for Units 1, 2, and 3, as defined in Inspection Procedure 71151.

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 October 1, 2014, through September 30, 2015, 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 constituted verification of the mitigating system performance index for cooling water support systems Units 1, 2, and 3, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors reviewed the licensee's evaluated exercises and selected drill and training evolutions that occurred between January 2014 and June 2015, to verify the accuracy of the licensee's data for classification, notification, and protective action recommendation (PAR) opportunities. The inspectors reviewed a sample of the licensee's completed classifications, notifications, and PARs to verify their timeliness and accuracy. The inspectors used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported. The specific documents reviewed are described in the attachment to this report.

These activities constituted verification of the drill/exercise performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.5 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors reviewed the licensee's records for participation in drill and training evolutions between January 2014 and June 2015 to verify the accuracy of the licensee's data for drill participation opportunities. The inspectors verified that all members of the licensee's emergency response organization (ERO) in the identified key positions had been counted in the reported performance indicator data. The inspectors reviewed the licensee's basis for reporting the percentage of ERO members who participated in a drill. The inspectors reviewed drill attendance records and verified a sample of those reported as participating. The inspectors used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported. The specific documents reviewed are described in the attachment to this report.

These activities constituted verification of the emergency response organization drill participation performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.6 Alert and Notification System Reliability (EP03)

a. Inspection Scope

The inspectors reviewed the licensee's records of alert and notification system tests conducted between January 2014 and June 2015 to verify the accuracy of the licensee's data for siren system testing opportunities. The inspectors reviewed procedural guidance on assessing alert and notification system opportunities and the results of periodic alert and notification system operability tests. The inspectors used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the data reported. The specific documents reviewed are described in the attachment to this report.

These activities constituted verification of the alert and notification system reliability 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, and other documentation to identify trends that might indicate the existence of a more significant safety issue. To verify that the licensee was taking corrective actions to address identified adverse trends that might indicate the existence of a more significant safety issue, the inspectors reviewed corrective action program documentation associated with the following licensee-identified trend:

- From mid-2013 to mid-2015, the licensee experienced an increase in inadequate maintenance activities requiring rework. Inadequate work practices have resulted in exceeding Limiting Condition of Operation (LCO) durations and have challenged equipment reliability [CR 15-09661-004].

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

b. Observations and Assessments

For the declining trend involving inadequate maintenance requiring rework, the licensee performed a high level review of data over a two year period to determine if a common cause beyond those identified in the event-specific causal analyses could be identified. The evaluation examined 21 maintenance related events occurring during the past two years. Fifteen of the events were attributed to procedures or instructions that were either unclear or not technically accurate. The corrective actions for six of the events required additional steps to be added to the maintenance instructions.

The licensee's evaluation concluded that the increase in the level of detail required in work instructions indicates a change in the knowledge and experience level of their maintenance work force. The licensee's data also indicated that human performance

error rates tend to decrease and performance improves when front line supervisors spend time in the field with workers. However, the licensee also noted that their maintenance department currently has a large population of front line supervisors with limited leadership experience.

The licensee recognized the need to ensure that the level of detail in work instructions is regularly monitored and re-evaluated as the experience level within the maintenance shops changes. The licensee has issued action items to ensure that a post-job critique is conducted when work is performed on safety-related equipment, and to update the station rework procedure to provide clear guidance for when and how to conduct a human performance evaluation for maintenance requiring rework.

The licensee also revised their maintenance department procedure addressing front line supervisor observation and mentoring activities to ensure that front line supervisors take into consideration individual worker capabilities such as a lack of proficiency or experience when determining which tasks to observe. The licensee will also update this procedure to require maintenance leadership to identify potential high-consequence activities during the work planning process and to name an observer to be present for those targeted high-consequence maintenance activities.

The inspectors considered that in response to this trend, the licensee had completed an appropriate evaluation and had developed appropriate corrective actions.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

On October 13, 2015, the inspectors selected for follow-up the issue of the reliability of continuously energized ARD relays.

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to ensure that discrepancies in the manufacturing process will not adversely affect the performance of safety related equipment.

This activity constitutes completion of one annual follow-up sample as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)

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

.1 NRC Event Number 51522: Notice of Unusual Event Due to Containment Fire Alarm

On November 9, 2015, at 5:33 a.m. Mountain Standard Time (MST), Palo Verde Unit 2 received a containment fire alarm in Fire Zone 63B (Steam Generator 2) while pressurizing containment for integrated leak rate testing (ILRT) in Mode 5. Control room operators noted that containment temperature and pressure were 72 degrees Fahrenheit and 13 psig, respectively. Personnel were unable to enter containment to validate the fire alarm since containment pressure was greater than 0.5 psig. As a result the station declared an Unusual Event (HU2.1) at 5:47 a.m. MST for a fire in containment which was unable to be validated within 15 minutes of receipt. No safety functions were impacted due to the fire alarm. No automatic or manual RPS or ESF actuations occurred and none were required. Containment was entered at 8:17 a.m. MST following depressurization. Licensee inspection of containment and Fire Zone 63B identified no indication of fire or smoke. The fire alarm was determined to be invalid. The Unusual Event was terminated on November 9, 2015, at 9:01 a.m. MST. The inspectors responded to the control room to verify that the information provided by the Emergency Notification System (ENS) communicator was complete and accurate and no further Agency response was warranted. When licensee personnel entered containment after depressurization, no evidence of combustion was identified. Further reviews of the Technical Requirements Manual revealed a note indicating that the fire alarms inside containment should be bypassed during ILRT sequences, because the higher pressure, more dense air inside containment can disrupt the detector's monitoring stream in a manner similar to smoke particulates. The ILRT was reperformed satisfactorily with the fire alarms in bypass.

.2 (Closed) Licensee Event Report 05000530/2015-001-00, "Leakage From Reactor Coolant Pump 2A Suction Pipe Instrument Nozzle"

(Closed) Unresolved Item (URI) 05000530/2015002-04, TAC Number MF6276 – NOED Number 15-4-01. Notice of Enforcement Discretion of Technical Specification 3.5.3 Emergency Core Cooling System - Operating Conditions B and C

On April 7, 2015, during the Unit 3 Refueling Outage 18, the licensee discovered reactor coolant system pressure boundary leakage at instrument nozzle 18 on the 2A reactor coolant pump suction piping. The leakage was discovered during a planned visual inspection of Unit 3 hot and cold leg nozzles. Isotopic analysis of the leak deposits indicated that the leak had occurred between 6 and 10 months prior to discovery. The leak was not detectable while the unit was operating either by the licensee's reactor coolant system leak rate determination procedure or by containment atmospheric radiation monitor trend reviews. The leak was not detectable visually during the previous refueling outage. Visual evidence of the leakage was consistent with a small leak of short duration with no "popcorn" buildup of boric acid at the leakage site. The licensee determined that the cause of the leakage was primary water stress corrosion cracking of the alloy 600 instrument nozzle. The licensee corrected the leakage using a half nozzle repair method and installed a new alloy 690 nozzle with alloy 52M weld material. After completing the repair, the licensee submitted a relief request to allow

operation with uncharacterized flaws in the remnant j-groove weld and nozzle left in place after the half nozzle repair. The relief request was for operation through the end of refueling cycle 3R19.

The inspectors reviewed the circumstances surrounding the discovery of the leak, observed portions of the repair activity during the refueling outage, and reviewed the licensee's apparent cause evaluation of the leak. The inspectors determined that reactor coolant system boundary leakage is a Severity Level IV violation of Limiting Condition of Operation (LCO) 3.4.14.a which requires that reactor coolant system operational leakage shall be limited to no pressure boundary leakage. If pressure boundary leakage exists, required action 3.4.14.B requires the licensee to place the unit in operational Mode 3 within 6 hours and within operational Mode 5 within 36 hours. Based on a review of the event, the inspectors concluded that the leakage existed for a period that began on an unknown date that was more than 36 hours before April 4, 2015, and ended when the reactor shut down on April 4, 2015. The reactor coolant system operational leakage was not limited to no pressure boundary leakage, and the licensee did not place the unit in operational Mode 3 within 6 hours and within operational Mode 5 within 36 hours.

The issue was evaluated using the traditional enforcement process because no performance deficiency was associated with the violation of NRC requirements. Inspection Manual Chapter 0612, Power Reactor Inspection Reports, Section 0612-09, states, in part, that such violations are dispositioned using traditional enforcement and may warrant enforcement discretion. The inspectors reviewed NRC Enforcement Policy, Section 6.1 ("Reactor Operations") to evaluate the significance of this violation. This violation was more-than-minor and best characterized as Severity Level IV (very low safety significance) because it is similar to the example in the NRC Enforcement Policy, Section 6.1.d.1. Additionally, a qualitative assessment of the observed reactor coolant system leakage condition concluded the risk was of very low safety significance (Green). The basis for this qualitative risk determination was that the leakage rate was very small with little boron residue accumulation and no appreciable accumulation on nearby components. Any leakage was within the capability of reactor coolant system makeup systems.

The NRC is exercising enforcement discretion in accordance with Section 3.5 of the NRC Enforcement Policy and not issuing an enforcement action for the violation of Technical Specification 3.4.14.a (EA-15-158) for the following reasons: this issue is of very low safety significance (Green); the NRC determined that this issue was not within the licensee's ability to foresee and correct; the licensee's actions did not contribute to the degraded condition, and; the actions taken were reasonable to identify and address this matter. Further, because the licensee's actions did not contribute to this violation, it will not be considered in the assessment process or the NRC's Action Matrix. Specific documents reviewed during this inspection are listed in the attachment.

Licensee Event Report 05000530/2015-001-00 is closed.

Unresolved item 05000530/2015002-04 is closed.

.3 (Closed) Licensee Event Report 05000530/2015-002-00, "Condition Prohibited by Technical Specification 3.0.4 Due to an Inoperable Atmospheric Dump Valve (ADV)"

On May 2, 2015, following completion of refueling activities, Unit 3 commenced testing of atmospheric dump valves (ADVs). Testing determined that ADV 178 would not stroke more than 13 percent open. Operators declared ADV 178 inoperable and entered LCO 3.7.4 Condition A. The licensee determined that ADV 178 had been inoperable when Unit 3 entered Mode 4 and continued to Mode 3, and issued the licensee event report to report a condition prohibited by Technical Specifications.

The licensee determined that internal piston rings were improperly re-assembled during maintenance performed during the refueling outage. The licensee concluded the apparent cause of the incorrect piston ring installation was human error by maintenance personnel and inadequate procedure instructions. To prevent recurrence, the licensee initiated actions to provide detailed guidance on the proper orientation of the piston rings and to require verifications of proper re-assembly.

The inspectors reviewed the licensee event report and documented a licensee-identified violation in Section 4OA7 of this report.

Licensee event report 05000530/2015-002-00 is closed.

.4 (Closed) Licensee Event Report (LER) 05000530/2015-003-00, Damaged High Pressure Safety Injection Pump Motor Journal Bearing

On May 30, 2015, emergent maintenance on the Unit 3 train A high pressure safety injection (HPSI) pump motor outboard journal bearing performed under Nuclear Regulatory Commission (NRC) approved Notice Of Enforcement Discretion 15-4-01 exceeded the Technical Specification Limiting Condition for Operation (LCO) completion time for LCO 3.5.3, "Emergency Core Cooling Systems - Operating, Condition C.1." The high pressure safety injection (HPSI) pump A had been removed from service on May 27, 2015, at 6:28 a.m., for planned routine maintenance. During maintenance, it was discovered that the motor outboard journal bearing was damaged. The bearing was replaced and the pump was declared operable on May 30, 2015, at 5:10 p.m.

The root cause was work instruction weaknesses which resulted in improper reassembly of the HPSI pump motor during planned maintenance in the Unit 3 spring 2015 refueling outage. Immediate corrective actions replaced the damaged outboard motor bearing and properly reassembled the pump and motor. To prevent recurrence, the licensee plans to revise maintenance procedures to provide enhanced guidance for pump and motor reassembly.

The licensee notified the inspectors about the issue shortly after the condition was discovered. The inspectors visually examined the failed journal bearing and interviewed maintenance personnel and a vendor representative regarding the physical configuration and sequence of events that led to damage and how the replacement bearing when properly installed would have adequate clearances to function as designed. When the licensee was preparing to request a NOED, the inspectors walked down the risk-management actions associated with the corresponding risk assessment, which included pre-staging certain diverse and flexible (FLEX) mitigating equipment that are capable of performing the safety-injection function in the event of a primary LOCA. The NRC granted the NOED, and while the NOED was in effect the inspectors regularly monitored

the progress of the repairs through interactions with the control room and work control center staff. The inspectors reviewed the post-maintenance testing documentation that returned the pump to service. Following the event, the inspectors reviewed the cause evaluations and other corrective action documentation, including the vendor's post-mortem evaluation of the failed journal bearing.

No findings or violations of NRC requirements were identified.

Licensee event report 05000530/2015-003-00 is closed.

40A6 Meetings, Including Exit

Exit Meeting Summary

On February 6, 2015, the inspectors discussed the in-office review of the preliminary scenario for the March 4, 2015, biennial exercise, submitted December 18, 2014, with Mr. J. Fearn, Manager, Emergency Preparedness, and other members of the licensee staff. The licensee acknowledged the issues presented. The March 4, 2015, biennial exercise was subsequently rescheduled to September 16, 2015.

On October 2, 2015, the inspectors presented the results of the onsite and in-office inspection of the biennial emergency preparedness exercise conducted September 16, 2015, including the results of the in-office inspection of changes to the licensee's emergency plan and implementing procedures, to Mr. R. Edington, Chief Nuclear Officer, 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 October 23, 2015, the inspectors presented the inspection results to Mr. R. Bement, Senior 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 October 30, 2015, the inspector presented the radiation safety inspection results to Mr. G. Andrews, Director, Nuclear Regulatory Affairs, 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 November 19, 2015, the inspectors presented the final inspection results to Mr. J. Cadogan, Vice President of Nuclear Engineering, Ms. M. Lacal, Vice President of Regulatory Oversight, Mr. M. McLaughlin, General Plant Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On December 22, 2015, the inspector briefed Mr. G. Andrews and other members of the licensee's staff of the results of the licensed operator requalification program inspection. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 7, 2016, the inspectors presented the inspection results to Mr. R. Bement 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

Listed below is one violation of very low safety significance (Green) and one violation of Severity Level IV that were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as non-cited violations.

- Technical Specification 3.0.4 requires, in part, that when an LCO is not met, entry into a mode or other specified condition in the applicability shall only be made when the associated actions in the mode permit continued operation; a risk assessment is performed and accepted for the inoperable components; or when an allowance is stated. Technical Specification 3.7.4, "Atmospheric Dump Valves," requires that four ADV lines shall be operable in Modes 1, 2, 3, and 4 when the steam generator is relied upon for heat removal. Contrary to the above, on May 1, 2015, Unit 3 operators entered a mode with an LCO not met. Specifically, one atmospheric dump valve line was not operable as required by Technical Specification 3.7.4 prior to entering Mode 3.

The licensee's investigation concluded that the valve failure was a result of inadequate reassembly following maintenance. The licensee reported this condition in Licensee Event Report 05000530/2015-002-00 as a condition prohibited by Technical Specifications due to entering a mode in the applicability of LCO 3.7.4 while the LCO was not met.

The inspectors concluded that the finding is of very low safety-significance (Green) because it was not a design or qualification deficiency, did not result in a loss of safety function, did not result in a loss of function of a train of safety equipment out greater than its allowed outage time, or a loss of function of high importance maintenance rule equipment greater than 24 hours. The licensee has entered the issue in the corrective action program as CRDR 4654422.

- Title 10 CFR 55.49, "Integrity of examinations and tests," requires, in part, that facility licensees shall not engage in any activity that compromises the integrity of any application, test, or examination required by this part. Contrary to the above, during the week of November 9, 2015, the licensee caused a compromise of examination integrity when two licensed operators, who had previously validated portions of the 2015 annual operating test and had signed the examination security agreement, administered emergency preparedness (EP) job performance measures (JPMs) to a total of three licensed operators who had not yet taken their annual operating test. Specifically, the two licensed operators validated and/or approved simulator scenarios and EP JPMs for the annual operating test and then subsequently administered JPMs to three other licensed operators for the purpose of supporting EP program indicators. If not for detection, this activity could have affected the equitable and consistent administration of the annual operating examination.

The failure to meet 10 CFR 55.49 was evaluated through the traditional enforcement process because it impacted the ability of the NRC to perform its regulatory oversight function. This resulted in assignment of a Severity Level IV violation because it involved a nonwillful compromise of examination integrity and is consistent with Section 6.4.d of the NRC Enforcement Policy.

The associated performance deficiency was screened as Green because it had no actual effect on the equitable and consistent administration of any examination required by 10 CFR 55.59, "Requalification." The licensee entered this issue into their corrective action program as Condition Report 15-10910.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

N. AaronsCooke, Nuclear Regulatory Affairs
J. Allison, Examination and Simulator Group Section Leader
G. Andrews, Director, Nuclear Regulatory Assurance
R. Bement, Senior Vice President, Nuclear Operations
D. Bence, Manager, Operations
R. Black, Engineer, RMS Systems
B. Bolf, Section Leader, Engineering
P. Bury, Director, Nuclear Training
J. Cadogan, Vice President, Engineering
R. Carburneau, Department Leader, Nuclear Assurance
C. Coles, Department Leader, Security
R. Davis, Director, Emergency Preparedness
E. Dutton, Director, Nuclear Assurance
R. Eddington, Chief Nuclear Officer
M. Fallon, Director, Communications
J. Fearn, Manager, Emergency Preparedness
Z. Goldwasser, Operations Training Manager (Acting)
T. Gray, Superintendent, Radiation Protection Technical Support
K. Graham, Assistant Plant Manager, Operations
R. Harley, Program Engineer, Heat Exchangers
D. Heckman, Senior Compliance Consultant, Regulatory Affairs
J. Jenkins, System Engineer, Spray Pond and Essential Cooling Water
G. Jones, Supervisor, Radiation Protection
M. Karbassian, Director, Engineering
C. Kharrl, General Plant Manager, Operations
M. Lacal, Vice President, Operations Support
S. Lantz, Dosimetry Section Leader, Radiation Protection
T. Marco, Director, Human Relations
M. McGhee, Department Leader, Nuclear Regulatory Assurance
M. McLaughlin, General Plant Manager, Operations Support
M. Meyer, Design Engineer, Civil
D. Mims, Senior Vice President, Nuclear Regulatory Affairs and Oversight
C. Moeller, Director, Technical Support (Acting)
R. O'Neal, Senior Technician, Radiation Protection
F. Oreshac, Consultant, Regulatory Affairs
R. Quick, Examination Developer
R. Routollo, Manager, Radiation Protection (Acting)
G. Sowers, Leader, RMS Systems
B. Thiele, Department Leader, Engineering
R. Vega, Design Engineer, Mechanical
J. Waid, Director, Executive Projects
T. Weber, Department Leader, Nuclear Regulatory Affairs

NRC Personnel

C. Peabody, Sr. Resident Inspector
D. Reinert, Resident Inspector
D. You, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000530/2015-001-00	LER	Leakage From Reactor Pump 2A Suction Pipe Instrument Nozzle (Section 4OA3.2)
05000530/2015-002-00	LER	Condition Prohibited by Technical Specification 3.0.4 Due to an Inoperable Atmospheric Dump Valve (ADV) (Section 4OA3.3)
05000530/2015-003-00	LER	Damaged High Pressure Safety Injection Pump Motor Journal Bearing (Section 4OA3.4)
05000530/2015002-04	URI	Notice of Enforcement Discretion of Technical Specification 3.5.3 Emergency Core Cooling System – Operating Conditions B and C (Section 4OA3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40OP-9PC01	Fuel Pool Cooling	13
40ST-9SI13	LPSI and CS System Alignment Verification	33
40OP-9DG01	Emergency Diesel Generator A	74
73ST-9XI15	CP (Power Access Purge) Valves – Inservice Test	9
73ST-9CL06	Containment Purge Supply Leak Test (42”) – Penetration 56	21

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15-11026

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<u>Number</u>	<u>Title</u>	<u>Revision</u>
01-M-SIP-001	P & I Diagram Safety Injection and Shutdown Cooling System	54
01-M-SIP-002	P & I Diagram Safety Injection and Shutdown Cooling System	41
01-M-SIP-003	P & I Diagram Safety Injection and Shutdown Cooling System	11
02-M-PCP-001	P & I Diagram Fuel Pool Cooling & Cleanup System	30
02-P-PCF-501	Fuel Building Spent Fuel Pool Cooling and Cleanup System Isometric	3
02-P-PCF-502	Fuel Building Isometric Spent Fuel Pool Cooling and Cleanup System	1
02-P-PCF-503	Fuel Building Spent Fuel Pool Cooling and Cleanup System Isometric	0
02-P-PCF-504	Fuel Building Spent Fuel Pool Cooling and Cleanup System Isometric	0
01-M-CPP-0001	P & I Diagram Containment Purge System	23

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	PVNGS Updated FSAR	17
	Palo Verde Nuclear Generating Station Design Basis Manual – CP System	8

Palo Verde Action Requests (PVARs)

3551524	3553875	3553877	3561786	2711167
3240449	4058036			

Section 1R05: Fire Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9ZZ19	Operational Considerations due to Plant Fire	29
40OP-9HJ02	Control Building HVAC (Smoke Removal)	5

Miscellaneous

<u>Title</u>	<u>Revision</u>
Pre-Fire Strategies Manual	25
PVNGS Updated Final Safety Analysis Report	18

Section 1R06: Flood Protection Measures

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13-MC-DG-0204	Diesel Generator Building Flooding Analysis	6
	Pre-Fire Strategies	25

Condition Reports (CRs)

15-09026

Section 1R07: Heat Sink Performance

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13-CC-SP-0015	Essential Spray Pond Concrete Wall & Slab Design	9
13-MC-DG-0411	DG Heat Exchanger Minimum Flow Rate vs. Inlet SP Water Temperature	4
13-MC-PC-0217	Spent Fuel Cooling System - Shutdown Cooling and Pool Cooling Heat Transfer Evaluation	5
13-MC-SP-0307	SP/EW System Thermal Performance Design Bases Analysis	9
N001-0901-00012	Shutdown Cooling System Performance	2

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
02-M-DGP-001, Sht. 4	P & I Diagram Jacket Water Diesel Generator System	56
02-M-DGP-001, Sht. 5	P & I Diagram Cooling Water Diesel Generator System	56
MN950-A00001	EW Heat Exchanger Replacement - B&W Essential Cooling Water HX Outline Drawing	1
MN950-A00051	EW Heat Exchanger Replacement - B&W Essential Cooling Water HX Outline Drawing	1

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	2A DG Jacket Water Heat Exchanger Visual Inspection	June 2, 2014
	2A DG Jacket Water Heat Exchanger Visual Inspection	October 1, 2015
	2B EW Heat Exchanger Visual Inspection	October 16, 2015
	3A EW Heat Exchanger Visual Inspection	April 9, 2015
	Diesel Generator System Health Report	Q3-2015
	Essential Cooling Water System Health Report	Q3-2015
	Essential Spray Pond Chemistry Control Strategy	5
	Essential Spray Ponds System Health Report	Q3-2015
74DP-9CY04	Systems Chemistry Specifications	88
13-CN-0389	Installation Specification for Control of Tornado Borne Missiles in Outside Areas	3

Modifications

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SP-1592	Spray Pond Wall Refurbishment	3
SP-1338	Spray Pond Bypass Line	1
SP-1076	Spray Pond Install Spray Pond Continuous Blowdown Piping	2

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13-MS-B061	Essential Cooling Water Heat Exchanger Test Protocol	0
13-MS-B062	Shutdown Cooling Heat Exchanger Test Protocol	0
40OP-9SI01	Shutdown Cooling Initiation	55
70TI-9EW03	EW Heat Exchanger Improved Test Performance	2
73DP-0ZZ04	Service Water Reliability Program	9
73DP-9ZZ10	Guidelines for Heat Exchanger Thermal Performance Analysis	8
73DP-9ZZ11	Heat Exchanger Program	13
73DP-9ZZ21	Heat Exchanger Visual Inspection	21
01DP-0XX01	Control and Monitoring of Potential Tornado Borne Missiles	3

Thermal Performance Analyses

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Essential Cooling Water Heat Exchanger (3MEWAE01) Thermal Performance Test Report	October 6, 2013
255-01145	Essential Cooling Water Heat Exchanger (3MEWAE01) Thermal Performance Test Report	April 4, 2009
513-00018	Shutdown Cooling Heat Exchanger (1MSIBE01) Thermal Performance Test Report	October 10, 2011

Vendor Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Diesel Generator Jacket Water Cooler Specification Sheet	September 15, 1977
	Essential Cooling Water Heat Exchanger Specification Sheet	January 14, 1976
	Shutdown Heat Exchanger Specification Sheet	April 15, 1976
VTD-E270-00001	Engineers & Fabricators Co. (EFCO) Technical Manual for Shutdown Cooling Heat Exchangers (Pub.# 12446)	3

Condition Reports

15-11180	15-11182	15-11210	14-00705	14-01140	12-01186
15-11278	15-11336	15-11331	15-11279		

Condition Report Action Items

4479651

Condition Report Disposition Requests

4281157

Palo Verde Action Requests

4461014 4528726 4614440 4614384 3490856 3773970

Work Orders

4098391

Section 1R08: Inservice Inspection Activities

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
70TI-9ZC01	Boric Acid Walkdown Leak Detection	18
73DP-9ZC01	Boric Acid Corrosion Control Program	7
73TI-0ZZ13	Radiographic Examination	18
73TI-9ZZ05	Dry Magnetic Particle Examination	16
73TI-9ZZ07	Liquid Penetrant Examination	16
73TI-9ZZ10	Ultrasonic Examination of Welds in Ferritic Components	14
73TI-9ZZ14	Ultrasonic Examination of Bolting	13
73TI-9ZZ17	Visual Examination of Welds, Bolting, and Components	12
73TI-9ZZ18	Visual Examination of Component Supports	13
73TI-9ZZ19	Visual Examination of Pump and Valve Internal Surfaces	15
73TI-9ZZ22	Visual Examination For Leakage - Interval 3	8
73TI-9ZZ23	Ultrasonic Examination of Reactor Coolant Pump Flywheels	8
PDI-UT-1	Generic EPRI Procedure for the Ultrasonic Examination of Ferritic Pipe Welds	E
PDI-UT-2	Generic EPRI Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	F
73TO-9RC10	Bare Metal Visual Examination of Reactor Vessel Bottom Head	4
MN725-00866	Palo Verde Steam Generator Visual Examination	4

Boric Acid Walkdown Condition Reports

2-2015-08204	2-2015-08210	2-2015-08211	2-2015-08213	2-2015-08214
2-2015-08369	2-2015-08511	2-2015-08513	2-2015-08514	2-2015-08515
2-2015-08770	2-2015-08773	2-2015-08775	2-2015-08924	2-2015-08925
2-2015-09163	2-2015-09624			

Condition Reports

4528936	4533568	4539283	4545911	4593988
4604012	4606352	4609663	4615318	4615322
4617363	4617862	4637192	4645001	4645318
4646325	4654567			

Reviewed Examinations

<u>Number</u>	<u>Location</u>	<u>Type</u>
15-UTE-2058	SG Tubesheet to Head, 2-004-107	Phased Array Ultrasonic
15-UTE-2055	Nozzle to Vessel Inner Radius Weld 2-004-102-IR	Phased Array Ultrasonic
15-UTE-2054	Nozzle to Vessel Inner Radius Weld 2-004-101-IR	Phased Array Ultrasonic

Miscellaneous

<u>Document Number</u>	<u>Title</u>	<u>Revision/Date</u>
Generic Letter 88-05	Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants	March 17, 1988
PV Letter to Westinghouse MN725-A02009	U2R19 Steam Generator Inspection Outage Scope	August 12, 2015
EWR 4708562	Palo Verde Steam Generator Visual Examination	4
	Engineering Evaluation on Apparent Rust Residue on the Reactor Closure Head	October 22, 2015
Report 15-1000	BMI Bare Metal Visual Examination	October 12, 2015
DIPC 4418137-6	Fabricate the FLEX Alternate RCS Discharge Tie-In piping per EDC 2013-00541 drawings	October 23, 2015
	Level 3 Evaluation Report 15-09624-002	November 6, 2015
	Ultrasonic Calibration Report Number 15-UT-2020	October 30, 2015
	Ultrasonic Calibration Report Number 15-UT-2024	October 30, 2015
	Ultrasonic Calibration Report Number 15-UT-2027	October 30, 2015
	Palo Verde 2R19 BMI Pictures, by Remote Digital Video Inspection	

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	66
EP-0901	Classifications	9
EP-0906	Termination and Recovery	2

Condition Reports (CRs)

15-10819 15-10823 15-10825 15-10910

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
51522	NRC: Event Notification Report for November 10, 2015	
15DP-00T04	Appendix I, LOCT Exam Summary	December 18, 2015
	Licensee analysis of exam security issue	December 9, 2015
	Comparison of E-Plan JPMs Administered to Annual Operating Exam JPMs	December 9, 2015

Section 1R12: Maintenance Effectiveness

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Performance Criteria Formulation Bases, Systems: CL – Containment Integrity	6
	Maintenance Rule Expert Panel Action Record	May 8, 2014
PVAR 4530043	Maintenance Rule (a)(1) Issue Tracking Form	3

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
70DP-0RA01	Shutdown Risk Assessments	49
40AO-9ZZ23	Loss of SFP Level or Cooling	27

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Daily Plant Status Package	October 28, 2015
	Appendix B Protected Equipment Scheme	October 16, 2015
	Daily Plant Status Package	October 19, 2015

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Unit 2 Archived Operator Log 10/27/15- 10/29/15	October 29, 2015
	2R19 Outage Control Center Turnover	October 28, 2015 6:00AM
SSFA Sheets	Shutdown Safety Function Assessment, Reactor Vessel Head Off, RCS above RV Flange	October 28, 2015 3:00AM
SSFA Sheets	Shutdown Safety Function Assessment, Reactor Vessel Head Off, RCS above RV Flange	October 16, 2015 3:00PM

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40ST-9ZZ10	Post Accident Monitoring Instrumentation Channel Checks	30
40AO-9ZZ23	Loss of SFP level or Cooling	27
40DP-9OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment	42
40AO-9ZZ20	Loss of HVAC	8

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Operator Work Around/ Operator Burden Log	
	POD: Analysis of Record uses an Incorrect Time Step for Reactor Vessel Internal Blowdown Load Sampling Rate	
	Unit 3 Containment RAS Sump Water Level Data	2014/2015
	Unit 3 Containment Recirc-A Sump Level 10/18-10/21, 2015	Wednesday October 21, 2015 12:46 PM
4716046	Engineering Evaluation	November 12, 2015
	Updated Final Safety Analysis Report	18

Condition Reports (CRs)

15-07886	PVAR 4539469	14-01272	15-10791	15-10131
15-09553	15-06289	15-07486	15-11627	15-09007

Engineering Work Order (ENG)

4540274	4721319
4709044	

Section 1R18: Plant Modifications

Temporary Modification Work Order

4712119

Section 1R19: Post-Maintenance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
36ST-9SA04	ESFAS Train B Subgroup Relay Shutdown Functional Test	25
73ST-9XI43	Containment Recirculation Sump Isolation Valve Leak Test	3
73ST-9XI04	SI Train B Valves – Inservice Test	35
39MT-9ZZ06	Disassembly/Assembly of Limatorque Type SMB/SB-00 Actuators	16
36ST-9SE02	Exore Linear Monthly Calibration	82
40ST-9GT04	Station Blackout Generator 1 Quarterly Test	6

Surveillance Test Work Order (STWO)

4555509	4555249	4555283
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Work Order (WO)

4274282	4538355	4719850	4629390	4681852
4569410	4707719	4707566	4707566	

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Unit 2: 3-Day Critical Path October 22, 2015	October 22, 2015

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Material Usage Sheet for WO #4274282	October 22, 2015
	Machine Shop Work Activity Sheet for WO #4274282	October 10, 2015
	Valve Services Work Order Continuation Sheet for WO #4274282 Day Shift	October 22, 2015
	Valve Services Work Order Continuation Sheet for WO #4274282 Night Shift	October 22, 2015
	Valve Services Work Order Continuation Sheet for WO #4274282 Day Shift	October 23, 2015
	M&TE Functional Test Usage Log	October 22, 2015
	QSS Installation Log for WO#4538355	October 22, 2015
	Foreign Material Exclusion Risk Evaluation for WO#4538355	October 22, 2015
	Non-Permit Required Confined Space Work Authorization Form October 24, 2015 at 0630	October 24, 2015
	Non-Permit Required Confined Space Work Authorization Form October 24, 2015 at 1040	October 24, 2015
	Valve Services Work Order Continuation Sheet for WO #4538355 Day Shift	October 24, 2015
	Valve Services Work Order Continuation Sheet for WO #4538355 Night Shift	October 23, 2015
	Valve Services Work Order Continuation Sheet for WO #4538355 Night Shift 1	October 21, 2015
	Valve Services Work Order Continuation Sheet for WO #4538355 Night Shift 2	October 21, 2015
	MOV Post-Test Data Review Worksheets for WO #4538355	October 24, 2015
PL1827473	Pick List for WO#4538355	
TEP-3-013	Teledyne Instruments: Test Services	11

Condition Reports (CRs)

15-11433 15-09284 15-09711

Section 1R20: Refueling and Other Outage Activities

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9OP02	Conduct of Shift Operations	66

Condition Reports (CRs)

15-08758

Miscellaneous

<u>Title</u>	<u>Revision</u>
Specific Manuever Plan: EOC Shutdown 99.6% to 40%	0

Section 1R22: Surveillance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
73ST-9CL01	Containment Leakage Type B and C Testing	44
73TI-9ZZ37	Pre-ILRT Local Leak Rate Tests	7
40ST-9SF01	CEA Operability Checks	35
73ST-9CL02	Integrated Leak Rate Test	13

Condition Reports (CRs)

15-09879

Work Orders (WO)

4553110 4553111 3473801

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Condition Reports (CRs)

CR 4560294 CRAI 4508029 CRAI 4585373 CRAI 4580375 CRDR 4498529
CRDR 4507479 CRDR 4508028 CRDR 4580252 CRDR 4580302 PCR 4506411
SWCR 4580294

Section 1EP7: Exercise Evaluation – Hostile Action Based

Procedures and Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Palo Verde Nuclear Generating Station Emergency Plan	55
	After Action Report/Improvement Plan	March 6, 2013
	After Action Report/Improvement Plan	March 12, 2015
EP-0901	Classifications	9
EP-0902	Notifications	7
EP-0903	Accident Assessment	3
EP-0904	ERO-ERF Activation and Operation	4
EP-0905	Protective Actions	7
40AO-9ZZ24	Deliberate Acts Against PVNGS	27
40DP-00P02	Conduct of Shift Operations	68
40EP-9EO01	Standard Post-Trip Actions	19
40EP-9EO07	Loss of Offsite Power/Loss of Forced Circulation	26
40EP-9EO09	Functional Recovery	49
40EP-9EO10	Standard Appendices	89
16DP-0EP23	Emergency Preparedness Drill-Exercise Administration	9
16DP-0EP34	Emergency Response Organization	2
16EP-0BD02	Alternate Facility Activation and Guidance	0
4552939	Self-Assessment: Emergency Preparedness	November 21, 2014
4628454	Self-Assessment: NRC Evaluated HAB Exercise	February 27, 2015
14-04015-003	Self-Assessment Title	July 24, 2015
090-05067	January 2013 – EP Augmentation Drill Report	January 29, 2013
090-05069	2013 February 6 EP Full Scale Exercise Report	February 14, 2013
090-05070	February 2013 – EP Augmentation Drill Report	February 20, 2013
090-05071	2013 First Quarter ERO Table Top Drill Report	March 1, 2013
090-05073	2013 March 6 NRC Evaluated Exercise Report	March 19, 2013
090-05074	March 2013 – EP Augmentation Drill Report	March 27, 2013
090-05075	2013 Contaminated Injury/HP Drill Report	May 9, 2013

Procedures and Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
090-05076	2013 Environs Drill Report	May 10, 2013
090-05077	May 2013 – EP Augmentation Drill Report	May 17, 2013
090-05078	June 2013 – EP Augmentation Drill Report	June 12, 2013
090-05079	2013 Second Quarter ERO Table Top Drill Report	June 28, 2013
090-05081	July 2013 – EP Augmentation Drill Report	August 19, 2013
090-05083	2013 Third Quarter ERO Table Top Drill Report	September 20, 2013
090-05084	September 2013 – EP Augmentation Drill Report	September 20, 2013
090-05087	September 2013 – EP Make-Up Augmentation Drill Report	October 3, 2013
090-05088	2013 Health Physics Drill Report (NOV)	November 27, 2013
090-05090	November 2013 – EP Augmentation Drill Report	December 6, 2013
090-05092	August 2013 – EP Augmentation Drill Report	January 29, 2014
090-05093	December 2013 – EP Augmentation Drill Report	
090-05097	January 2014 – EP Augmentation Drill Report	February 12, 2014
090-05099	July 2, 2013 PVNGS Unit 1 Unusual Event	February 27, 2014
090-05100	September 2, 2013 Unit 2 Unusual Event	February 27, 2014
090-05102	2013 Fourth Quarter ERO Table Top Drill Report	February 21, 2014
090-05103	2014 March 5 EP Full Scale Exercise Report	June 25, 2014
090-05104	2014 Environs Drill Report	April 10, 2014
090-05105	2014 Onsite Contaminated Injury/HP Drill Report	March 14, 2014
240-02753	2014 Assembly/Accountability/Search & Rescue Drill Report	May 15, 2014
240-02759	2014 3 rd Quarter ERO Tabletop Drill Report	September 4, 2014
240-02760	September 2014 – EP Off Hours Augmentation Drive-In Drill Report	September 26, 2014
240-02761	2014 4 th Quarter EP Augmentation Drill Report	November 13, 2014
240-02764	2014 Health Physics Drill Report (NOV)	December 9, 2014
240-02768	2015 1 st Quarter – EP Augmentation Drill Report	February 27, 2015
240-02770	1513 Mini Drill – ERO RED Team (July 2015)	August 7, 2015

Procedures and Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
240-02773	2015 Contaminated Injury/HP Drill Report	July 24, 2015
9631-02755	June 2014 – EP Augmentation Drill Report	June 24, 2014
9631-02757	2014 2 nd Quarter ERO Tabletop Drill Report	July 18, 2014

Corrective Action Program (Palo Verde Action Requests, Condition Report Documentation Request, PVAR/CRDR)

4362602	4362605	4362619	4411110	4424157
4439743	4444149	4451729	4451768	4485584
4485657	4520627	4532907	4547646	4556451
4556831	4556854	4558724	4599995	4566834
4576705	4577413	4577421	4577426	4593539
4605303	4617849	4619820	4619962	4620061
4620142	4620194	4620252	4620500	4628329

Corrective Action Program (Condition Reports, CRs)

15-00264-001	15-04164	15-05693	15-07536	15-07577
15-07579	15-07581	15-07858	15-07862	15-07865
15-07867	15-07894	15-07900	15-07908	15-07912
15-07919	15-07943	15-07951	15-08025	15-08026
15-08028	15-08050	15-08065	15-08113	15-08118
15-08171	15-08172	15-08174	15-08177	15-08187
15-08191				

1EP8 Exercise Evaluation – Scenario Review

Procedure and Document

<u>Title</u>	<u>Date</u>
Preliminary Exercise Scenario for the March 4, 2015, Biennial Emergency Preparedness Exercise	December 18, 2014

Section 2RS5: Radiation Monitoring Instrumentation

Audits, Self-Assessments and Surveillance

<u>Number</u>	<u>Title</u>	<u>Date</u>
NAD Audit 2014-007	PVNGS Nuclear Assurance Department Audit Plan and Report	October 3, 2014

Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
Unit 1 RU-143	Plant Vent Radiation Monitor – Normal	October 12, 2012
Unit 2 RU-143	Plant Vent Radiation Monitor – Normal	October 12, 2012
Unit 3 RU-143	Plant Vent Radiation Monitor – Normal	October 12, 2012
Unit 1 RU-4	Steam Generator Blowdown Monitor	June 22, 2015
Unit 2 RU-4	Steam Generator Blowdown Monitor	May 23, 2015
Unit 3 RU-4	Steam Generator Blowdown Monitor	April 28, 2015
Unit 2 RU-31	A-Train Control Room Vent Intake Radiation Monitor	August 20, 2015
Unit 1 RU-141	Condenser Vacuum Pump Gland Exhaust	October 24, 2014
Unit 2 RU-141	Condenser Vacuum Pump Gland Exhaust	March 29, 2014
Unit 3 RU-141	Condenser Vacuum Pump Gland Exhaust	April 4, 2015
Unit 1 RU-1	Containment Building Atmosphere	October 21, 2014
Unit 2 RU-1	Containment Building Atmosphere	April 16, 2014
Unit 3 RU-1	Containment Building Atmosphere	April 16, 2015
Unit 3 RU-148	In Containment Area Radiation Monitor	April 4, 2015
Unit 1 RU-148	In Containment Area Radiation Monitor	October 24, 2014
Fastscan 1	Whole Body Counter	February 2015
Fastscan 2	Whole Body Counter	January 2015
1214	Thermo Fisher PM-12	July 24, 2015
1214	Thermo Fisher PM-12	October 25, 2015
515	BC-4 Instrument Calibration	August 5, 2015
1190	Thermo Eberline Model FH 40 GL	August 21, 2015
1245	Thermo Eberline Model FH 40 GL	July 1, 2015
1674	AMS-4	August 28, 2015
11390	AMS-4	August 26, 2015
12022	iPCM-12	July 23, 2015

Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
12024	iPCM-12	July 16, 2015
12028	iPCM-12	July 9, 2015
667	SAM-12	August 14, 2015
668	SAM-12	September 30, 2015
1399	RM-20 Count Rate Meter	July 10, 2015

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	PVNGS Multi-Channel Analyzer Calibrations 2015	
	PVNGS Liquid Scintillator Calibrations 2015	
	PVNGS Units 1,2, and 3 Offsite Dose Calculation Manual	September 30, 2011
	PVNGS Technical Requirements Manual – Units 1,2,3	November 17, 2011
	System Health Report: SQ – Radiation Monitoring	February 1, 2014 - July 31, 2014
	System Health Report: SQ – Radiation Monitoring	August 1, 2014, January 31, 2015
	PVNGS Units 1,2, and 3 Technical Specifications	Amendment 165
	RMS Maintenance Rule List	October 2015
2013	Annual Radioactive Effluent Release Report	April 24, 2014
2014	Annual Radioactive Effluent Release Report	April 25, 2015

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
74AL-9SQ01	Radiation Monitoring System Alarm Validation & Response	0
74RM-9EF42	Radiation Monitor Alarm Setpoint Determination	28
74RM-9EF43	Actions for Inoperable Radiation Monitors	15
75RP-9EQ19	Operation of a Shephard 89 Calibrator	9
75RP-9EQ13	Canberra Whole Body Counting System Calibration	5
75RP-9EQ20	Calibration of Counter Scalers	5

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
74AL-9SQ01	Radiation Monitoring System Alarm Validation & Response	0
75RP-9EQ26	Operation and Verification of the Merlin Gerin Model CDM-21 Calibrator	9
75RP-9EQ31	Calibration, Response Check and Operation of the SAM-12 Small Article Monitor	2
75RP-9EQ45	Calibration of the Thermo Eberline Model FH 40 GL	1
75RP-9EQ46	Calibration of the AMS-4	2
75RP-9EQ66	Calibration of the Thermo Scientific Model RO-20 Ion Chamber Survey Meter	0
75RP-9EQ64	Calibration and Response Check of the Thermo Fisher Scientific Contamination Monitor Type iPCM-12	2
75RP-9EQ65	Calibration and Response Check of the Thermo Fisher Scientific Contamination Monitor Type PM12	3
74ST-9SQ10	Train "A" Radiation Monitoring Quarterly Functional Test Procedure	0
74ST-9SQ20	Radiation Monitoring Calibration Test for RU-1	17
74ST-9SQ23	Radiation Monitoring Calibration Test For New Scope Area Monitors	14
74ST-9SQ26	Radiation Monitoring Calibration Test for RU-143	15
74ST-9SQ27	Radiation Monitoring Calibration Test for RU-144	15a
74ST-9SQ28	Radiation Monitoring Calibration Test for RU-145	14
74ST-9SQ29	Radiation Monitoring Calibration Test for RU-146	13a
NRY26-C-0001	RMS Overview Continuing Training	5

Condition Reports

14-02224	14-02360	4321142	4389560	4397640
4433018	4433066	4439809	4447801	4449240
4577013	4571078	4578499	4566479	4566480
4280849	4451966	4452722	4455326	4464175
4465756	4468598	4469194	4472344	4473847
4476298	4499100	4499788	4499849	4504912
4637988	4639459	4641898	4649441	4656126

Section 4OA1: Performance Indicator Verification

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13-NS-C075	MSPI Basis Document	9
16DP-0EP19	Performance Indicator Emergency Preparedness Cornerstone	16, 17
16DP-0EP37	Prompt Notification System	5
70DP-0PI01	Performance Index Data Mitigating Systems Cornerstone	8
71DP-0AP01	Mitigating Systems Performance Index Program	3
93DP-0LC09	Data Collection and Submittal using INPO's Consolidated Data Entry System	11
EP-0901	Classifications	8, 9
EP-0902	Notifications	6,7
EP-0905	Protective Actions	5, 6, 7

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Siren Operating Manual	December 2013
	Palo Verde Nuclear Generating Station Alert and Notification System FEMA 350 Report	July 2014
	System Health Report – AF	September 30, 2015
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	7

Condition Reports (CRs)

15-071118 14-02805

Corrective Action Program (Condition Report Documentation Request, CRDRs)

4362033	4373436	4462026	4481968	4553485
4576281	4593539	4619962	4611986	

Section 40A2: Problem Identification and Resolution

Condition Reports (CRs)

PVAR 4630922	PVAR 4567339	PVAR 4599826	15-01058	15-09661-004
15-04924				

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	ODMI: Enhanced Monitoring Guidance for ARD660 relays	April 30, 2015
	Prompt Operability Determination: Continuously Energized ARD Relay Reliability	0
	ODMI 4228815 ARD Relay Test Plan	
CRDR 4036719	Failure of Three ARD660UR Relays	1

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Engineering Damage Evaluation for: Palo Verde Nuclear Plant	June 22, 2015
	Notice of Enforcement Discretion for Arizona Public Service (TAC Number MF6276, NOED Number 15-4-01	June 4, 2015
	Primary Area Operator Logs, Modes 5 and 6	June 24, 2015
102-07056-DCM/DCE	Request for Notice of Enforcement Discretion for Technical Specification 3.5.3, ECCS – Operating	June 2, 2015
15-09661-002	Level 3 CR Evaluation	
4661345	CRAI Maintenance Rule Functional Failure Evaluation – U3 High Pressure Safety Injection Motor Bearing Damaged	
51522	NRC: Event Notification Report for November 10, 2015	

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
40DP-9OP02	Conduct of Shift Operations	66
40DP-9OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment, Appendix K	41
EP-0901	Classifications	9

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EP-0906	Termination and Recovery	2
70DP-0MR01	Maintenance Rule	40
70DP-0RA05	Management o Risk in Modes 1 & 2	22
02DP-9RS01	Opearational Risk Management	1

Condition Reports (CRs)

15-03934 15-10819 15-10823 15-10825

Corrective Action Program (Condition Report Documentation Request, CRDRs)

4661343 4654422