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

August 6, 2018

Mr. Robert S. Bement
Executive Vice President Nuclear/
Chief Nuclear Officer
Arizona Public Service Company
P.O. Box 52034, MS 7602
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000528/2018002, 05000529/2018002, AND 05000530/2018002

Dear Mr. Bement:

On June 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station Units 1, 2, and 3. On July 12, 2018, the NRC inspectors discussed the results of this inspection with Ms. M. Lacal, Senior Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented three findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. The NRC is treating these violation as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

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

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Palo Verde Nuclear Generating Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Neil O'Keefe, Branch Chief
Project Branch D
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000528/2018002, 05000529/2018002, and 05000530/2018002
w/ Attachments:
1. Supplemental Information
2. Inservice Inspection Document Request
3. Occupational Radiation Safety Inspection Document Request

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000528, 05000529, 05000530
License Numbers:	NPF-41, NPF-51, NPF-74
Report Numbers:	05000528/2018002, 05000529/2018002, and 05000530/2018002
Enterprise Identifier:	I-2018-002-0013
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station
Location:	5801 South Wintersburg Road, Tonopah, AZ 85354
Inspection Dates:	April 1, 2018 to June 30, 2018
Inspectors:	C. Peabody, Senior Resident Inspector D. Reinert, PhD, Resident Inspector D. You, Resident Inspector W. Sifre, Senior Reactor Inspector L. Carson II, Senior Health Physicist W. Cullum, Reactor Inspector J. Melfi, Project Engineer C. Stott, Reactor Inspector
Approved By:	Neil O'Keefe, Chief, Project Branch D Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection report at Palo Verde Nuclear Generating Station, Units 1, 2, and 3, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

Failure to Re-baseline Valve Stroke Times as Required by ASME OM Code			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000528/2018002-01 Closed	[H.1] - Human Performance, Avoid Complacency	71111.12 - Maintenance Effectiveness
The inspectors identified a Green, non-cited violation of Palo Verde Technical Specification 5.5.8, "Inservice Testing Program," which requires inservice testing of ASME Code Class 1, 2, and 3 components in accordance with the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code). On October 22, 2017, the licensee failed to establish new stroke time reference values for Unit 1 safety injection (SI) valve 660 following maintenance which could affect the valve's performance.			

Failure to Implement and Maintain Procedures Regarding Breathing Air Quality			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000528/2018002, 05000529/2018002, 05000530/2018002-02 Closed	[H.4] - Human Performance, Teamwork	71124.03 - In-Plant Airborne Radioactivity Control and Mitigation
The inspectors identified a Green, non-cited violation of 10 CFR 20.1703 for failing to implement and maintain written procedures to ensure that respiratory protection equipment (air compressors and bubble hood suites) was supplied respirable air of grade D quality or better to radiation workers.			

Failure to Assess the Operability of a Degraded or Nonconforming Structure, System, or Component			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000530/2018002-03 Closed	[H.13] - Human Performance, Consistent Process	71152 - Problem Identification and Resolution
The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings” for the failure of licensee personnel to evaluate conditions adverse to quality for impacts on the operability of the essential spray ponds.			

PLANT STATUS

Unit 1 began the inspection period at rated thermal power. On April 5, 2018, power was reduced to 40 percent as directed by Station Chemistry procedures to address sodium levels caused by leakage into the main condenser. Unit 1 returned to full power on April 12, 2018, and remained at or near rated thermal power for the remainder of the inspection period.

Unit 2 began the inspection period at rated thermal power. On May 23, 2018, the reactor tripped from full power when maintenance on the control element drive mechanism control system resulted in a dropped control rod. The dropped control rod caused a valid reactor trip signal for low departure from nucleate boiling ratio. Unit 2 restarted on May 25, 2018; however, a different control element drive mechanism control system problem occurred requiring power to be held at 10 percent for additional repairs. Unit 2 returned to full power on May 27, 2018, and remained at or near rated thermal power for the remainder of the inspection period.

Unit 3 began the inspection period at rated thermal power. Unit 3 shut down for a planned refueling outage from April 6 through May 4, 2018. Unit 3 returned to full power on May 7, 2018. On June 27, 2018, Unit 3 the steam generator 1 economizer valve failed (main feedwater regulating valve). Operator performance issues in responding to this condition resulted in a main feedwater pump trip and reactor cutback, reactor trip caused by low steam generator water level, and a main steam isolation signal due to subsequent high steam generator water level. Unit 1 remained shut down for repairs during the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, “Light-Water Reactor Inspection Program - Operations Phase.” The inspectors performed plant status activities described in IMC 2515 Appendix D, “Plant Status” and conducted routine reviews using IP 71152, “Problem Identification and Resolution.” The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Summer Readiness (1 Sample)

The inspectors evaluated summer readiness of offsite and alternate alternating current (AC) power systems on May 9, 2018.

Seasonal Extreme Weather (1 Sample)

The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of extreme summer temperatures on May 11, 2018.

Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for impending summer monsoon storms on June 14, 2018.

71111.04 - Equipment Alignment

Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) Unit 1 control element drive mechanism control system, on April 18, 2018
(2) Unit 2 diesel generator B, on May 30, 2018
(3) Unit 3 essential spray pond B, on June 21, 2018
(4) Unit 3 auxiliary feedwater pump B, on June 27, 2018

Complete Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the Unit 1 essential cooling water system, on May 14, 2018.

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection (6 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

(1) Unit 3, condensate storage tank combustible material controlled area, Fire Zone 83, on April 3, 2018

(2) Unit 1, control element drive mechanism control system room, Fire Zone 54, on April 18, 2018

(3) Unit 2, non-class battery and switchgear room, Fire Zone TB4, on May 10, 2018

(4) Unit 2, condensate storage tank combustible material controlled area, Fire Zone 83, on May 15, 2018

(5) Unit 2, essential cooling water pump B room, Fire Zone 34B, on May 16, 2018

(6) Unit 1, 120’ auxiliary building corridor, Fire Zone 52A and 52D, on May 21, 2018

71111.07 - Heat Sink Performance

Heat Sink (1 Sample)

The inspectors evaluated Unit 3 train A shutdown heat exchanger performance, on May 1, 2018

71111.08 - Inservice Inspection Activities (1 Sample)

The inspectors directly observed the following non-destructive examinations:

(1) Dye Penetrant Examination

a) Auxiliary feedwater, Weld 58-19, pipe to tee, Report 18-PT-3009

b) Reactor coolant, Weld 2-60-89, tube housing lower, Report 18-PT-3014

c) Reactor coolant, Weld 2-59-89, control element drive mechanism tube housing lower, Report 18-PT-3017

d) Safety injection, Weld 74-1, elbow to shutdown cooling heat exchanger (SDCHX) an outlet nozzle, Report 18-PT-3006

e) Steam generator, Weld 58-1, nozzle extension to nozzle, Report 18-PT-3012

(2) Ultrasonic Examination

a) Charging system, Weld 13-11, nozzle to safe end, Report VE-18-3007
b) Reactor coolant, Weld 9-11, nozzle to safe end, Report VE-18-3001
c) Reactor coolant, Weld 10-18, nozzle to safe end, Report VE-18-3004

(3) Visual Examination

a) Reactor coolant, Weld 5-2-IR, nozzle inner radius, Report 18-VT-3174

The inspectors reviewed the following non-destructive examination records:

(1) Dye Penetrant Examination

a) Steam generator, Weld 58-1, nozzle extension to nozzle, Report 18-PT-3012
b) Steam generator, Weld 61-15, pipe to valve, Report 18-MT-3003

(2) Ultrasonic Examination

a) Charging system, Weld 13-11, nozzle to safe end, Report VE-18-3007
b) Reactor coolant, Weld 9-11, nozzle to safe end, Report VE-18-3001
c) Reactor coolant, Weld 10-18, nozzle to safe end, Report VE-18-3004

(3) Magnetic Particle Examination

a) Steam generator, Weld 50-19, pipe to Sweepolet, Report 18-MT-3011
b) Steam generator, Weld 61-16, valve to pipe, Report 18-MT-3004
c) Steam generator, Weld 61-17, pipe to penetration, Report 18-MT-3005

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

(1) Gas Tungsten Arc Weld

a) Reactor coolant flex hose lines, Report 18-316 to 18-323

Vessel Upper Head Penetration Inspection Activities

The licensee did not perform a bare metal head inspection on the Unit 3 reactor vessel upper head penetrations.

Boric Acid Corrosion Control Inspection Activities Inspection Scope

The inspectors evaluated the licensee's boric acid control program performance.

Steam Generator Tube Inspection Activities Inspection Scope

The inspectors reviewed the steam generator tube eddy current (EC) examination scope and expansion criteria to determine whether these criteria met technical specification requirements, Electric Power Research Institute (EPRI) guidelines, and commitments made to the NRC. The inspectors also reviewed whether the EC inspection scope included areas of degradations that were known to represent potential EC test challenges such as the top of tube sheets, tube support plates, and U-bends. The licensee preventatively plugged 31 tubes in steam generator 31 and 19 tubes in steam generator 32. The licensee identified and removed Flexitallic gasket parts in the secondary side of the steam generators.

Identification and Resolution of Problems

The inspectors reviewed 45 condition reports which dealt with inservice inspection activities and found the corrective actions for inservice inspection issues were appropriate.

71111.11Q - Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1Sample)

The inspectors observed and evaluated Phoenix Risk Monitor demonstration and training. Phoenix Risk Monitor is a new software system that will be used to implement the technical specifications risk informed completion time program, as well as 10CFR 50.65(a)(4) risk online management process.

Operator Performance (1 Sample)

The inspectors observed and evaluated Unit 1 operators perform a power reduction from 100 percent to 40 percent in order to repair a leak in the 1B condenser hotwell on April 5, 2018.

71111.12Q - Maintenance Effectiveness

Routine Maintenance Effectiveness (3 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) Structural integrity of the Unit 1 spray ponds below the waterline, on May 15, 2018

(2) Essential cooling water heat exchangers performance monitoring and aging management program, on May 17, 2018

(3) Performance of the Unit 1 safety injection A combined minimum flow recirculation valve, on June 26, 2018

71111.13 - Maintenance Risk Assessments and Emergent Work Control (4 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

(1) Unit 3 elevated risk during high pressure safety injection pump A unavailability, on April 2, 2018

(2) Unit 3 emergent risk for corrective maintenance for stuck open vent valve SI-608 on safety injection tank 1B, on May 8, 2018

(3) Unit 2 weekly risk assessment for the week of May 21, 2018, including scheduled train unavailability for auxiliary feedwater B and containment spray B and elevated trip initiator risk for control element drive mechanism fuse replacements, on May 25, 2018

(4) Unit 2 weekly risk assessment for the week of June 11 including scheduled train unavailability for high pressure safety injection B, auxiliary feedwater B, and diesel generator B, on June 15, 2018

71111.15 - Operability Determinations and Functionality Assessments (7 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) Unit 2 safety injection tank 1A vent valve SI-633 loss of remote shutdown function, on April 2, 2018

(2) Unit 2 diesel generator A fuel leak on 7L metering rod, on April 4, 2018

(3) Unit 3 auxiliary feedwater pump N Doble testing results exceeding power factor criteria, on April 12, 2018

(4) Unit 1 D-Panel class 1E circuit breaker doors inhibited from closing by tagout hangers, on April 26, 2018

(5) Reactor coolant pumps 3-1A, 2-1B, 1-1A, 3-2A, 2-1A, 2-2A, 3-1B, 1-2B anti reverse rotation device secured with different types of bolts, on April 27, 2018

(6) Unit 3 transition from mode 5 to mode 4 with an inoperable containment sump using Technical Specification 3.0.4.b, on May 2, 2018

(7) Unit 3 reactor vessel head inner o-ring leakage and reactor head vent system leakage, on May 8, 2018

71111.18 - Plant Modifications (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

(1) Unit 3 degraded voltage under voltage relay replacement, Modification PB-1655
(2) Unit 3 main transformer lead differential protection upgrade, Modification MA-1679

71111.19 - Post-Maintenance Testing (5 Samples)

The inspectors evaluated the following post-maintenance tests:

(1) Unit 1 diesel fuel oil transfer pump power cable replacement, on April 11, 2018
(2) Unit 3 auxiliary feedwater pump B megger testing, on April 11, 2018
(3) Unit 3 in core instrument replacements, on May 8, 2018
(4) Unit 3 safety injection tank 1B vent valve replacement, on May 8, 2018
(5) Unit 2 control element assembly 51 ACTM card replacement, on May 26, 2018

71111.20 - Refueling and Other Outage Activities (3 Samples)

(1) Unit 3 the inspectors evaluated refueling outage 3R20 activities from April 7–May 4, 2018

(2) Unit 2 the inspectors evaluated activities during an unplanned outage to enact repairs to the control element drive mechanism control system from May 23–25, 2018

(3) Unit 3 the inspectors evaluated activities during an unplanned outage to enact repairs to the steam generator 1 economizer valve from June 27–July 1, 2018

71111.21N - Design Bases Assurance Inspection (Programs)

Programs (Environmental Qualification)

The inspectors evaluated environmental qualification program implementation through the sampling of the following components from May 7–24, 2018:

Component (8 Samples)

(1) Unit 2 containment penetration, 2JSEANE0001A

a) Inspectors performed a walkdown to visually inspect the containment penetration

b) Inspectors reviewed the work package for a neutron detector replacement and the post-maintenance testing associated with the detector replacement

c) Inspectors reviewed the equipment qualification data package

(2) Unit 1 train B Low pressure safety injection pump motor, MSBIP01

a) Inspectors reviewed maintenance and replacement records for the Low Pressure Safety Injection pump motor

b) Inspectors performed a walkdown to visually inspect the pump

c) Inspectors reviewed the equipment qualification data package

d) Inspectors reviewed the calculations associated with equipment qualification

(3) Unit 3 steam generator 1 main steam isolation valve controls, solenoid valve JSGAUY0170

a) Inspectors reviewed the high energy line break calculations for the area containing the component

b) Inspectors reviewed solenoid valve maintenance and testing records

c) Inspectors reviewed the solenoid valve equipment qualification data package

d) Inspectors reviewed the calculations for component heat-up during design basis events

(4) Unit 3 instrument air supply containment isolation gate valve, 3JIAAUV0002

a) Inspectors reviewed thermal life and post-accident operating time

b) Inspectors reviewed environmental tests performed with associated differences between the component as tested and as installed

c) Inspectors reviewed purchase, storage, and maintenance requirements

d) Inspectors walked down the component as installed in the plant and the storage facility where spare components are stored

e) Inspectors reviewed the applicable vendor technical manual and the environmental qualification package with applicable environmental testing

f) Inspectors reviewed operational experience and generic communications concerning the same and similar components

(5) Unit 3 containment pressure monitoring transmitter channel C, 3JHCCPT0351C

a) Inspectors reviewed thermal life and post-accident operating time

b) Inspectors reviewed environmental tests performed with associated differences between the component as tested and as installed

c) Inspectors reviewed purchase, storage, and maintenance requirements

d) Inspectors walked down the component as installed in the plant and the storage facility where spares are stored

e) Inspectors reviewed the applicable vendor technical manual and the environmental qualification package with applicable environmental testing

f) Inspectors reviewed operational experience and generic communications concerning the same and similar components at the site and in the industry

(6) Unit 3 train A low pressure safety injection discharge header containment isolation valve to reactor coolant loop 1B motor, 3JSIAUV0645

a) Inspectors reviewed thermal life and post-accident operating time

b) Inspectors reviewed environmental tests performed with associated differences between the component as tested and as installed

c) Inspectors reviewed purchase, storage, and maintenance requirements

d) Inspectors reviewed the applicable vendor technical manual and the environmental qualification package with applicable environmental testing

e) Inspectors reviewed operational experience and generic communications concerning the same and similar components at the site and in the industry

(7) Unit 2 safety injection tank 1B discharge isolation valve position switch, JSIAZSL0644

a) Inspectors reviewed thermal life and post-accident operating time

b) Inspectors reviewed environmental tests performed with associated differences between the component as tested and as installed

c) Inspectors reviewed purchase, storage, and maintenance requirements

(8) Unit 1 train A containment pressure transmitter, JHCAPT0353A

a) Inspectors reviewed thermal life and post-accident operating time

b) Inspectors reviewed environmental tests performed with associated differences between the component as tested and as installed

c) Inspectors reviewed purchase, storage, and maintenance requirements

Component Located within Primary Containment (1 Sample)

(1) Unit 3 A&B containment sump level indicator A, JSIALE0706

a) Inspectors reviewed photographs of the containment sump level indicators since a walkdown of the component was not practical

b) Inspectors reviewed indicator maintenance and testing records

c) Inspectors reviewed indicator equipment qualification data packages

d) Inspectors reviewed storage requirements for the replacement components

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (2 Samples)

(1) Unit 3 train A integrated safeguards testing, on April 9, 2018
(2) Unit 3 low power physics testing, on May 4, 2018

Containment Isolation Valve (1 Sample)

(1) Unit 3 local leak rate test for containment fire water penetration, on April 23, 2018

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls

Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions

Contamination and Radioactive Material Control (1 Sample)

The inspectors evaluated contamination and radioactive material controls

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection (RP) technician proficiency

71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

Engineering Controls (1 Sample)

The inspectors evaluated airborne controls and monitoring

Use of Respiratory Protection Devices (1 Sample)

The inspectors evaluated respiratory protection

Self-Contained Breathing Apparatus for Emergency Use (1 Sample)

The inspectors evaluated the licensee's self-contained breathing apparatus program

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification (7 Samples)

The inspectors verified licensee performance indicators submittals listed below:

(1) MS06: Emergency AC Power Systems (April 1, 2017–March 31, 2018)

(2) MS07: High Pressure Injection Systems (April 1, 2017–March 31, 2018)

(3) MS08: Heat Removal Systems (April 1, 2017–March 31, 2018)

(4) MS09: Residual Heat Removal Systems (April 1, 2017–March 31, 2018)

(5) MS10: Cooling Water Support Systems (April 1, 2017–March 31, 2018)

(6) OR01: Occupational Exposure Control Effectiveness Sample (October 1, 2017–March 31, 2018)

(7) PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual (RETS/ODCM) Sample (October 1, 2017–March 31, 2018)

71152 - Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

The inspectors reviewed the licensee's corrective action program for trends that might be indicative of a more significant safety issue.

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (2 Samples)

(1) The inspectors evaluated a Unit 2 reactor trip caused by an inadvertent dropped control rod (CEA 64) during planned maintenance and licensee's response and recovery, on May 23, 2018.

(2) The inspectors evaluated a Unit 3 reactor trip and main steam isolation actuation caused by operator errors in responding to a steam generator economizer valve hardware failure and the licensee's response and recovery, on June 27–28, 2018.

INSPECTION RESULTS

Observation	71152 - Problem Identification and Resolution

The inspectors reviewed the licensee's program for controlling potential tornado borne missiles (PTBMs) within the vicinity of the essential spray ponds. As described in UFSAR 3.5.1.4, tornado missile protection is not provided for the essential spray ponds nozzles because the licensee demonstrated with a probabilistic analysis that the probability of the loss of the ultimate heat sink safety function was acceptably low. In order to maintain the assumptions used in the probabilistic analysis, the licensee must administratively control the potential tornado borne missiles near the essential spray ponds. Procedure 01DP-0XX01, "Control and Monitoring of Potential Tornado Borne Missiles," provides the requirements and guidance for licensee personnel to identify and control potential missile hazards.

During the inspection period, the inspectors identified multiple non-compliances with the licensee's PTBM control program. These non-compliances included:

- PTBMs not tagged nor tracked within the licensee's database
- PTBM painted exclusion boundary markings missing
- Clusters of multiple PTBMs staged within the PTBM exclusion area
- PTBMs not shielded from the essential spray pond nozzles in accordance with procedure 01DP-0XX01
- Groups of PTBMs not bundled in accordance with Procedure 01DP-0XX01

The inspectors shared their observations with licensee management. The individual non-compliances were entered into the licensee's corrective action program and addressed. In response to the inspectors' observations, the licensee wrote CR 18-05858 that identified another trend of an increase in non-compliances with PTBM requirements during refueling outages. The licensee planned to add a pre-outage challenge board for evaluating what controls will be implemented during the outage to ensure compliance with the PTBM program as part of the outage planning process. The licensee also issued two site wide communications to reinforce the expectations of the PTBM control program and has designated area owners for each of the PTBM monitoring zones.

Failure to Re-baseline Valve Stroke Times as Required by ASME OM Code			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000528/2018002-01 Closed	[H.1] - Human Performance, Avoid Complacency	71111.12 - Maintenance Effectiveness

The inspectors identified a Green, non-cited violation of Palo Verde Technical Specification 5.5.8, "Inservice Testing Program," which requires inservice testing of ASME Code Class 1, 2, and 3 components in accordance with the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code). On October 22, 2017, the licensee failed to establish new

stroke time reference values for Unit 1 safety injection (SI) valve 660 following maintenance which could affect the valve's performance.

Description: During Unit 1 refueling outage 1R20, the valve services group replaced SI valve 660 under work order 3470020. SI valve 660, safety injection combined recirculation to refueling water tank (RWT) isolation valve, is a normally open solenoid-operated valve that performs a passive safety function in the open position to provide a minimum recirculation flow path for the train A high pressure, low pressure, and containment spray pumps. SI valve 660 also performs an active function to close on a recirculation actuation signal to prevent containment sump water from being pumped to the RWT.

Following the valve's replacement, the licensee successfully performed a post-maintenance test on October 22, 2017, using procedure 73ST-9XI53, "Train A HPSI Injection and Miscellaneous SI Valves - Cycle - Inservice Test," Revision 8. The test consisted of stroking the valve closed, then open, and comparing the stroke times to Technical Specification limits. The licensee is committed to requirements of the ASME Operation and Maintenance Code 2012 edition. ASME OM Code section ISTC-3310, "Effects of Valve Repair, Replacement, of Maintenance on Reference Values," requires the following:

> *When a valve or its control system has been replaced, repaired, or has undergone maintenance that could affect the valve's performance, a new reference value shall be determined or the previous value reconfirmed by an inservice test run before the time it is returned to service or immediately if not removed from service. This test is to demonstrate that performance parameters that could be affected by the replacement, repair, or maintenance are within acceptable limits. Deviations between the previous and new reference values shall be identified and analyzed.*

The inspectors identified that the licensee did not establish new stroke time reference values after SI valve 660 was replaced in October 2017. The inservice testing engineering group was unaware that the valve had been replaced until January 2018. During its quarterly inservice test on January 4, 2018, SI valve 660 was tested using procedure 73ST-9XI13, "Train A HPSI Injection and Miscellaneous SI Valves - Quarterly - Inservice Test," Revision 31. The licensee identified a valve position indication issue during this test and valve technicians performed a limit switch adjustment to correct the indication issue. Because the limit switch adjustment was maintenance that could potentially affect the stroke time by changing the length of the measured valve stroke, valve service technicians initiated condition report 18-00197 to request a post-maintenance review by the inservice testing program manager. The IST engineering group then established new reference values based upon the as-left stroke times following the limit switch adjustment.

The inspectors reviewed the licensee's evaluation that determined the new stroke time reference values and questioned why the valve had not been previously been re-baselined following its replacement in October 2017. The licensee generated CR 2018-07443 to document this concern and initiate an evaluation.

Two different testing procedures were used to perform the two inservice testing activities in October 2017 and January 2018. Test procedure 73ST-9XI13 (an online-only test) includes step 7.2 that directs operators to write a condition report when the procedure is being performed as a post-maintenance test. Procedure 73ST-9XI53 (an outage-only test) lacked this step. Consequently, when SI valve 660 was replaced in October 2017, during refueling outage 1R20, the inservice testing engineering group was not notified to perform the post-maintenance review that would have established new stroke time reference values.

Corrective Action: The licensee revised the test instructions for procedure 73ST-9XI53 to ensure that the inservice testing engineering group receives post-maintenance review requests.

Corrective Action Reference: Condition Report 18-07443

Performance Assessment:

Performance Deficiency: The licensee's failure to establish new stroke time reference values in accordance with ASME OM Code after replacing Unit 1 SI valve 660 is a performance deficiency.

Screening: The performance deficiency is more-than-minor and a finding because if left uncorrected, it could lead to a more significant safety concern. Specifically, the failure to establish new reference values for SI valve 660 stroke time testing could have delayed the identification of a degrading trend in the valve's stroke times due to the continued erroneous use of a wider range of acceptable valve operation.

Significance: The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions" and determined that the finding was of very low safety significance (Green) because the finding did not represent a design or qualification deficiency, a loss of system or function, an actual loss of safety function of a single train for greater that its technical specification allowed outage time, or an actual loss of function for non-Technical Specification equipment.

Cross-cutting Aspect: The finding has a cross-cutting aspect in the area human performance associated with the resources aspect. Specifically, licensee leaders did not ensure that adequate inservice testing procedures were available to support successfully recognizing that new reference values needed to be established for SI valve 660 [H.1].

Enforcement:

Violation: Palo Verde Technical Specification 5.5.8, "Inservice Testing Program," requires the inservice testing of ASME Code Class 1, 2, and 3 components in accordance with the ASME Code for Operations and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition. OM Code section ISTC-3310 requires, in part, that when a valve has undergone maintenance that could affect the valve's performance, a new reference value shall be determined by an inservice test before it is returned to service.

Contrary to the above, prior to February 2, 2018, the licensee did not perform inservice test Unit 1 SI valve 660, an ASME Code Class 2 component, in accordance with the ASME Code for Operations and Maintenance of Nuclear Power Plants 2012 Edition. Specifically, after replacing Unit 1 SI valve 660 on October 18, 2017, a maintenance activity that could affect the valve's performance, the licensee failed to determine a new reference value with which to monitor the valve's performance, as required by ASME OM Code Section ISTC-3310.

Disposition: This violation is being treated as a non-cited violation consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Implement and Maintain Procedures Regarding Breathing Air Quality			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Occupational Radiation Safety	Green NCV 05000528/2018002, 05000529/2018002, 05000530/2018002-02 Closed	[H.4] - Human Performance, Teamwork	71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

The inspectors identified a Green, non-cited violation of 10 CFR 20.1703 for failing to implement and maintain written procedures to ensure that respiratory protection equipment (air compressors and bubble hood suites) supplied respirable air of grade D quality or better to radiation workers.

Description:

From April 19–26, 2016, during the Unit 1 Refueling Outage 19 (1RF19), the Unit 1 service air header was used to supply breathing air to respirators for 10 radiation workers performing steam generator nozzle dam activities in an airborne radioactivity area. The licensee used rented portable compressors to supply air to the service air header. The inspectors determined that, in addition to use during 1RF19, the portable compressor was infrequently used to supply the service air header with breathing air for respiratory protection on all three units in 2017 and 2018. The inspectors requested records associated with breathing air quality analyses from January 2017 through April 2018 and for the 1RF19 timeframe, in order to verify that the breathing air quality was analyzed to ensure that it was at least grade D. However, the licensee could not find any records that demonstrated they had analyzed or otherwise evaluated the breathing air quality.

Licensees are subject to 10 CFR 20.1703 when permitting the use of respiratory protection equipment to limit the intake of radioactive material. According to 10 CFR 20.1703(c)(4), licensees shall implement and maintain a respiratory protection program that includes, among other things, written procedures regarding breathing air quality. Breathing air quality is specified in 10 CFR 20.1703(g), which requires that atmosphere-supplying respirators be supplied with respirable air of grade D quality or better as defined by the Compressed Gas Association in publication G-7.1, "Commodity Specification for Air," 1997. Grade D quality air criteria are specified by this regulation and include: (1) Oxygen content (v/v) of 19.5-23.5%; (2) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less; (3) Carbon monoxide content of 10 ppm or less; (4) Carbon dioxide content of 1,000 ppm or less; and (5) Lack of noticeable odor.

The inspectors reviewed the following licensee procedures used for the respiratory protection program:

- 01DP-0IS10, PVNGS Respiratory Protection Program, Revisions 11 and 12
- 01DP-0IS08, PVNGS Respiratory Protection Equipment Usage, Revisions 20 and 21
- 14FT-9FP79, Compressed Air Cylinder Inspection and Repair, Revision 0

The inspectors determined that the licensee's procedures require the coating facility compressor system and the system for filling SCBA bottles to be tested to ensure grade E quality breathing air (better than grade D). However, the procedures did not require them to verify that portable compressors providing breathing air to workers met the breathing air

quality requirement. Specifically, Procedure 01DP-0IS08, Section 4.2.1.13, states, in part, that portable air compressors supplying breathing air do not have to be tested for air quality as long as the units use in-line filtration and carbon monoxide detection systems. While these measures may address specific components of breathing air quality, the licensee did not establish by testing or evaluation/analysis of the system design that the breathing air quality being provided was grade D or better.

Discussions with licensee personnel determined that the Industrial Health and Safety (IH&S) group had responsibility for administration of the site's respiratory protection program. The IH&S staff believed that OSHA requirements took precedence over NRC requirements with respect to respiratory protection. As a result, Radiation Protection staff were unaware that the air produced by portable compressors and used as breathing air for workers in supplied-air respirators in airborne radioactivity areas was not being tested to demonstrate compliance with NRC requirements.

The inspectors concluded that the licensee's written procedures did not adequately address breathing air quality, as defined in 10 CFR 20.1703(g), in that no guidance was provided to establish that grade D quality air was supplied to the service air header by portable compressors and, thereby, atmosphere-supplying respirators.

Corrective Action(s): Any immediate safety concern was addressed when the inspectors verified that, although the licensee had used the portable compressor to provide air to the service air header, the licensee had not used the system as a source of breathing air since the April 2016 Unit 1 refueling outage. Corrective actions will be determined during evaluation of Condition Report CR-18-07010.

Corrective Action Reference: Condition Report CR-18-07010

Performance Assessment:

Performance Deficiency: The failure to implement and maintain adequate procedures to ensure breathing air quality for compressors supplying air to the breathing air system, and thereby workers using air-supplied respirators, is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Plant Facilities/Equipment and Instrumentation. The performance deficiency adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation or radioactive material, in that, failure to provide acceptable breathing air quality could lead to respiratory distress and/or workers removing their respiratory protection equipment, and the potential inhalation of radioactive material.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008. This finding was not related to as low as reasonably achievable (ALARA) planning, did not involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. For these reasons, the inspectors concluded that the finding is of very low safety significance (Green).

Cross-cutting Aspect: The finding has a cross-cutting aspect in the area of human performance associated with teamwork because individuals and work groups failed to communicate and coordinate their activities within and across organizational boundaries to

ensure nuclear safety is maintained [H.4]. Specifically, staff in Industrial Health and Safety did not communicate and coordinate with Radiation Protection staff regarding the requirements associated with respiratory protection involving radioactive materials.

Enforcement:

Violation: 10 CFR 20.1703(c) requires, in part, that the licensee shall implement and maintain a respiratory protection program that includes written procedures regarding breathing air quality. Contrary to the above, from April 19, 2016, to present, the licensee failed to implement and maintain a respiratory protection program that included written procedures regarding breathing air quality. Specifically, licensee Procedure 01DP-01S10, "PVNGS Respiratory Protection Program," explicitly excluded portable compressors from testing to ensure breathing air quality. As a result, the Unit 1 service air header was used to supply breathing air to respirators for ten individuals working with steam generator nozzle dams in an airborne radioactivity area in April 2016 during 1RF19.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Assess the Operability of a Degraded or Nonconforming Structure, System, or Component			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000530/2018002-03 Closed	[H.13] - Human Performance, Consistent Process	71152 - Problem Identification and Resolution

The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to evaluate conditions adverse to quality for impacts on the operability of the essential spray ponds.

Description: On April 20, 2018, the inspectors performed a walkdown of the Unit 3 essential spray ponds and observed a localized concentration of approximately 150 items that represented potential tornado borne missile (PTBM) hazards per the licensee's program located northwest of the Unit 3 essential spray ponds. The hazards included pieces of metal conduit, wooden pallets, electrical cable spools, metal plates, and other miscellaneous items. The licensee wrote Condition Report (CR) 18-06666 to document and address this condition.

The essential spray ponds function as the ultimate heat sink. Spray nozzles, located above the surface of the essential spray ponds, are used to maintain post-accident design temperatures within safety analysis assumptions. The spray nozzles have no protective features to prevent damage from airborne missiles and, as a result, they are vulnerable to airborne missiles generated during a high wind event. During original plant licensing, the licensee used a probabilistic analysis to justify not providing tornado missile protection for the essential spray pond nozzles. This probabilistic approach is described in UFSAR 3.5.1.4. Two key inputs into this analysis are the maximum average missile density and the maximum localized missile density. Both limits are assumed inputs into the probabilistic analysis. The license basis average density limit for PTBMS is 20 missiles per 10,000 square feet averaged over a defined area around the essential spray pond and a localized limit of 60 missiles in any one 10,000 square foot area. The probabilistic analysis justifies that a tornado event will not

cause the loss of the heat removal function of the essential spray ponds so long as the licensee stays within these transient missile limits. If either PTBM limit is exceeded, the presumption of essential spray pond operability following a tornado event is no longer valid.

The licensee uses an administrative procedure, Procedure 01DP-0XX01, "Control and Monitoring of Potential Tornado Borne Missiles," Revision 4, to maintain the license basis average and local density limits for PTBM hazards. Appendix E of Procedure 01DP-0XX01 identifies the average and localized density limits. Step 4.9.3 states that a non-compliance with the design basis occurs when either the average missile density or a localized missile cluster exceeds the maximum allowable limits.

The licensee uses Procedure 40DP-9OP26, "Operations Condition Reporting Process and Operability Determination/Functional Assessment," Revision 44, for evaluating the operability of structures, systems, or components (SSCs) when a condition is identified that could impact a SSC's safety function. Operations personnel performed an immediate operability determination (IOD) to assess the condition described in CR 18-06666. Appendix J of Procedure 40DP-9OP26 describes the uses of the Not Applicable (N/A) trend code. Per step J.1.1, the use of the N/A trend is appropriate for conditions identified which are clearly not degraded or nonconforming. Appendix J lists several examples of Not Applicable trend coding. A CR written to identify a PTBM not tagged of tracked in an area which has margin to the maximum number of PTBMs is described as an example of an administrative issue that should not be considered a degraded or nonconforming condition.

In the IOD, the shift technical advisor assessed the PTBMs in CR 18-06666 against the average density limit, which was not exceeded, but did not consider the localized limit, which was exceeded. The shift technical advisor erroneously concluded that "Because there is not an identified degraded or nonconforming condition….this CR is trend coded N/A in accordance with Appendix J of 40DP-9OP26." However, the inspectors determined that the condition described in CR 18-0666 should have been considered a degraded or non-conforming because it was outside the limits of the license basis calculation. Because the shift technical advisor did not recognize that the local PTBM limit had been exceed, he did not evaluate whether the Unit 3 essential spray pond would have been able to perform its design basis function in its nonconforming condition.

The inspectors identified two additional recent examples in which operations personnel inappropriately applied the N/A trend code when clusters of PTBMs were identified with the vicinity of the essential spray ponds. CR 18-05094 documented pieces of PVC pipe near the Unit 2 spray ponds on April 1, 2018, and CR 17-17024 documented spray pond filter media bags and pallets near the Unit 3 spray pond on November 27, 2017. The IODs performed for each of these conditions also failed to recognize that the localized PTBM limits had been exceeded and both were trend coded as N/A.

Corrective Action: The licensee took immediate corrective action by removing the transient PTBMs from the vicinity of the essential spray ponds.

Corrective Action Reference: Condition Report 18-06666

Performance Assessment:

Performance Deficiency: The failure to evaluate all license basis limits when assessing the operability of the essential spray ponds is a performance deficiency.

Screening: The performance deficiency is more-than-minor and a finding because it is associated with the protection against external factors attribute of the mitigating systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the ultimate heat sink to respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to recognize that they were outside the analyzed limits for which the essential spray ponds would be presumed to remain operable following a tornado event.

Significance: The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings at Power," Exhibit 4, "External Events Screening Questions." Step 1.a. which required a senior reactor analyst to perform a detailed risk evaluation because if the equipment or safety function is assumed to be completely failed or unavailable, it would degrade one or more trains of a system that supports a risk significant system or function.

A regional senior reactor analyst performed a detailed risk evaluation and determined that the finding was of very low safety significance (Green). The analyst used the tornado missile frequency of 1.74E-6 tornados per year for the Palo Verde site developed from tornado data from January 1, 1950 - December 31, 2006, within 100 kilometers of the plant and reviewed per "Review of Methods for Estimation of High Wind and Tornado Hazard Frequencies," dated December 2012.

A postulated tornado at this frequency was assumed to cause a switchyard-centered loss of offsite power which could not be recovered within a 24-hour probabilistic risk assessment mission time. The analyst then set the failure to start basic events for both essential spray pond motor driven pumps to TRUE, thereby totaling failing both essential service water spray ponds in the Palo Verde SPAR model, Version 8.50, run on SAPHIRE, Version 8.1.8. This failure resulted in an increase in the conditional core damage probability of 7.1E-2 during the postulated tornado event.

The analyst then applied the assumed exposure time of three months to the tornado frequency and the increase in the conditional core damage probability to obtain a bounding estimate of the increase in core damage frequency from the performance deficiency of 3.1E-8 per year. This estimate made the significance Green or of very low safety significance for core damage frequency. Because not all of the spray nozzles would be damaged and some heat exchange capability would likely remain, the actual increase in core damage frequency would be expected to be less than this estimated value. Since the increase in core damage frequency was less than 1.0E-7, increase in large early release frequency was not analyzed. Losses of offsite power initiated by tornados were the dominant core damage sequences which were mitigated by the remaining auxiliary feedwater system and diesel generators.

Cross-cutting Aspect: The finding has a cross-cutting aspect in the area human performance associated with the consistent process aspect. Specifically, operations personnel did not demonstrate an understanding of the decision-making process regarding the identification and evaluation of non-compliances with the control of potential tornado borne missile programs [H.13].

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," requires that activities affecting quality be prescribed by instruction, procedures, or drawings, and be accomplished in accordance with those instructions, procedures, or drawings. The assessment of operability of the Unit 3 essential spray pond was an activity affecting quality

and implemented by Procedure 40DP-9OP26, Revision 44. Procedure 40DP-9OP26, Step E.5 requires that operators identify current licensing basis requirements that may be impacted.

Contrary to the above, on April 20, 2018, licensee operators failed to identify current licensing basis requirements that may be impacted. Specifically, when assessing a potential tornado borne missile cluster, operators did not identify the localized density limit, a current license basis limit, had been exceeded. Therefore, the licensee did not fully evaluate whether the Unit 3 essential spray pond would have been able to perform its design basis function.

Disposition: This violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

On April 19, 2018, the inspectors presented the inservice inspection results to Ms. M. Lacal, Senior Vice President, Regulatory and Oversight, and other members of the licensee staff. The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On April 27, 2018, the inspectors presented the radiation safety inspection results to Ms. M. Lacal, Senior Vice President, Regulatory and Oversight, and other members of the licensee staff. The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On May 24, 2018, the inspectors presented the Design Bases Assurance (Programs) inspection results to Mr. B. Rash, Vice President Nuclear Engineering, and other members of the licensee staff. The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On July 12, 2018, the inspectors presented the quarterly resident inspector inspection results to Ms. M. Lacal, Senior Vice President, Regulatory and Oversight, and other members of the licensee staff. The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
40OP-9ZZ19	Hot Weather Protection	7
40AO-9ZZ21	Acts of Nature	37
40AL-9RK1B	Panel B01B Alarm Responses	4
40DP-9OP34	Switchyard Administrative Control	21
40AO-9ZZ12	Degraded Electrical Power	72
40ST-9ZZ37	Inoperable Power Sources Action Statement	1

Condition Reports (CRs)

2879765 2873519

Work Orders (WOs)

3050186

Miscellaneous

Number	Title	Revision
ODP 10	Operations Department External Communications Practices	5

Section 1R04: Equipment Alignment

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Number	Title	Revision
40OP-9SF01	Control Element Drive Mechanism Control System (CEDMCS) Operation	30
40AL-9SF01	Local Alarm Panel J-SFN-C01D Responses	10
40OP-9SP02	Essential Spray Pond (SP) B	52
40ST-9AF08	Auxiliary Feedwater Pump AFB-P01 Monthly Valve Alignment	6

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01-M-EWP-001	P&I Diagram Essential Cooling Water System	32
01-P-EWF-201	Auxiliary Bldg. Isometric Essential Cooling Water System ECWS Pump Loop – Train A	4
01-P-EWF-202	Auxiliary Bldg. Isometric Essential Cooling Water System ECWS Pump Loop – Train B	5
01-P-EWF-301	Control Building Isometric Essential Cooling Water System	3
01-M-SPP-001	P&I Essential Spray Pond System	63
01-M-AFP-001	P&I Diagram Auxiliary Feedwater System	43

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18-06844 16-20392

Section 1R05: Fire Protection

Procedures

Number	Title	Revision
18FT-9FP38	Functional Test of Appendix R Fire/HELB Doors	1
14DP-0FP33	Control of Transient Combustibles	30

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18-05400 18-05170

Miscellaneous

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	PVNGS Pre-Fire Strategies Manual	26

Section 1R07: Heat Sink Performance

Procedures

Number	Title	Revision
70DP-0MR01	Maintenance Rule	44

Miscellaneous

Number	Title	Date
18-0252	Eddy Current Examination Report: U3 Shutdown Cooling A	April 18, 2018

Section 1R08: Inservice Inspection Activities

Procedures

Number	Title	Revision
30DP09MP23	Foreign Material Exclusion Controls	5
70TI-9ZC01	Boric Acid Walkdown Leak Detection	20
73DP-9WP04	Welding and Brazing Control	19
73DP-9WP05	Weld Filler Material Control	10
73DP-9ZC01	Boric Acid Corrosion Control Program	8
73TI-0EE01	Ultrasonic Instrument Calibration	5
73TI-0ZZ02	Ultrasonic Thickness Measurement	13
73TI-0ZZ13	Radiographic Examination	19
73TI-9RC01	Steam Generator Eddy Current Examinations	32
73TI-9ZZ05	Dry Magnetic Particle Examination	18
73TI-9ZZ06	Wet Magnetic Particle Examination	18
73TI-9ZZ07	Liquid Penetrant Examination	18
73TI-9ZZ09	Ultrasonic Examination of Pipe and Vessel Welds	17
73TI-9ZZ10	Ultrasonic Examination of Welds in Ferritic Components	14
73TI-9ZZ17	Visual Examination of Welds, Bolting, and Components	14
73TI-9ZZ18	Visual Examination of Component Supports	14
73TI-9ZZ22	Visual Examination for Leakage	12
73WP-0ZZ05	Welding of Ferritic and Martensitic Steels	15
81DP-0CC28	Classification of Structures, Systems, and Components	15
81DP-0CC28	Classification of Structures, Systems, and Components	0
81DP-9RC01	Palo Verde Nuclear Generating Station Steam Generator Management Program	18
NS-FS-FSO-WI-0006	Palo Verde Nuclear Generating Station Steam Generator Visual Examination (Rolls-Royce Proprietary)	6.1
PDI-UT-1	Performance Demonstration Initiative (PDI) Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds	1

Procedures

Number	Title	Revision
PDI-UT-10	PDI Generic Procedure for the Ultrasonic Examination of Dissimilar Metal Welds	1
PDI-UT-11	PDI Generic Procedure for the Ultrasonic Examination of Reactor Pressure Vessel Nozzle-to-Shell Welds and the Nozzle Inner Corner Radius	0
PDI-UT-2	PDI Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	2
PDI-UT-3	PDI Generic Procedure for Ultrasonic Through-Wall Sizing in Pipe Welds	2
PDI-UT-8	PDI Generic Procedure for the Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	2

Drawings

Number	Title	Revision/Date
03-M-PCP-00, Sheet 1 of 2	Piping and Instrumentation Diagram (P&ID) Fuel Pool Cooling and Cleanup System	32
03-M-PCP-00, Sheet 2 of 2	P&ID Fuel Pool Cooling and Cleanup System	32
03-M-PCP-0001	P&ID Fuel Pool Cooling and Cleanup System	32
03-P-SGF-120	Containment Building Isometric Main Steam System Feedwater Lines	4
13-C-ZCS-504	Containment Internals Refueling Pool Liner, Sheet 5	16
13-C-ZCS-504	Containment Internals Refueling Pool Stainless Steel Liner, Sheet 5	16
13-C-ZFS-0422	Fuel Building Liner Plate, Sections and Details, Sheet 3	14
13-C-ZFS-422	Fuel Building Liner Plate, Sections and Details, Sheet 3	14
C-113-4046	48 Inch Double Non-Equalizing Expansion Joint with Weld Ends	March 26, 1979
D-SYS80-630-054	Transfer Tube Weldment and Flange	1
E-SYS80-630-055, Sheet 1 of 2	Fuel Transfer Tube Assembly	6

Condition Reports (CRs)

14-00265	15-00956	16-03169	16-16086	16-16502
16-16768	16-17216	16-18718	16-19536	16-19841

Condition Reports (CRs)

17-01511	17-01923	17-02845	17-03101	17-03169
17-03539	17-04004	17-07081	17-07127	17-07234
17-07340	17-07341	17-07345	17-10119	17-13749
17-13750	17-14594	17-14620	17-14621	17-16352
17-16534	17-16929	17-17070	17-18467	18-00088
18-00090	18-00547	18-03285	18-05569	18-05816
18-05835	18-06064	18-06274	18-06277	18-06350

Work Orders (WOs)

4304410	4664172	466713

Miscellaneous

Number	Title	Revision/Date
EPRI 1000975	Boric Acid Corrosion Guidebook, Revision 1	November 2001
03-MS-A146	Steam Generator Condition Monitoring Evaluation, Unit 3, Cycle 18	April 12, 2015
03-MS-A155	U3R19 Steam Generator Degradation Assessment/Operational Assessment Review	October 1, 2016
17-09564	Welding Program Self-Assessment	June 30, 2017
N001-5.03-00052-1	Transfer Tube Weldment and Flange	1
N001-5.03-00399-	General Engineering Specification for Fuel Transfer Tube	June 6, 1984
SDOC N001-0503-00053(2)	Fuel Transfer Tube Assembly	6

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

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40DP-9OP02	Conduct of Operations	72
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	Standard Maneuver Plan: 150 EFPD 100 to 40%	0

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18-05261	18-05886	17-17403

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	Unit 1A Inspection Video	
16-13764-002	MRFF Evaluation for 3JEWALC0091	September 14, 2016
17-17403-003	MRFF Determination for Unit 2 NC Leakage into EW-A	January 2, 2018
18-05261-002	Engineering Evaluation	April 11, 2018
01-M-SPP-001	P&I Diagram: Essential Spray Pond System	63
	Essential Cooling Water System Health Report	2nd Quarter 2018

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

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40DP-9OP02	Conduct of Operations	72

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1021010-9	Solenoid Operated Valve Soft Seated Energize to Open Sizes 3/8” through 2”	B
03-M-SIP-002	P&I Diagram Safety Injection and Shutdown Cooling System	36

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Number	Title	Date
	Scheduler's Evaluation for PV Unit 3	May 7, 2018
	Palo Verde EOOS software	
	Scheduler's Evaluation for PV Unit 2	May 25, 2018
	Shutdown Safety Function Assessment for Unit 2	May 25, 2018

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision
40AO-9ZZ19	Control Room Fire	35

Condition Reports (CRs)

18-05906	18-03664	18-05232	18-02334	18-07701
18-07751				

Work Orders (WOs)

4980753

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Number	Title	Revision/Date
2018-R002	Licensing Document Change Request: TRM Component Lists T7.0.100 and T7.0.200	March 30, 2018
18-00619-008	Engineering Evaluation	May 3, 2018
18-00619-007	Engineering Evaluation	May 2, 2018
	Palo Verde Technical Specifications	April 6, 2018
18-05906-002	Engineering Evaluation	April 17, 2018
18-03664-003	Level 3 Evaluation Report	March 28, 2018
31227427	Engineering Evaluation of EDG fluid leakage and potential operability concerns	2

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Procedures

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40OP-9SA01	BOP-ESFAS Modules Operation	32

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4989102	4690453	4728616	4544651	

Section 1R19: Post-Maintenance Testing

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73ST-9DF01	Diesel Fuel Oil Transfer Pumps – Inservice Test	34
32MT-9ZZ21	4.16kV Motor Operational Testing	6
73ST-9SI37	Safety Injection Tank Nitrogen Vent Valves- Inservice Test	8

Condition Reports (CRs)

18-05813	18-08963

Work Orders (WOs)

4326942	4381898	4981134	4850125	4852867
4852923	5007848			

Miscellaneous

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78MT-9RI01	Withdrawal, Cutup, Installation and Insertion of Incore Instrument (ICI) Assemblies	25

Section 1R20: Refueling and Other Outage Activities

Condition Reports (CRs)

18-05402

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Number	Title	Revision/Date
4467778	Engineering Evaluation	October 30, 2013
Outage Plan	Unit 3 20th Refueling Outage	C
13-CN-0380	Scaffold Specification	24
388046	Clearance for SIT 2A outage	

Section 1R21N: Design Bases Assurance Inspection (Programs)

Procedures

Number	Title	Revision
12DP-0MC25	Stores	34
87DP-0MC39	Commercial Grade Dedication (CGD) Process	0

Drawings

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03-P-SGF-155	M.S.S.S. Isometric Main Steam	4
03-E-SGF-023, Sh. 2	Control Wiring Diagram Main Steam System Main Steam Isolation Valve 3J-SGE-UV-170	11
F-5160	Logic Diagram for Anchor/Darling Hydraulic Actuator F-5157 and F-5160	B

Condition Reports (CRs)

14-01293	14-01510	14-01552	14-01798	14-03626
14-02193	15-05733	15-00467	15-01120	15-12438
15-02141	15-03049	16-00209	16-07016	16-14037
17-01524	17-01674	17-07867	17-09374	17-00175
17-12722	17-15592	18-02412	18-04544	18-08729
18-07966	18-07967	18-07972	18-08049	18-08669
18-08136	18-08556			

Work Orders (WOs)

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4678231	4678228	4495917	4489944	4474094
4198033	4813518	4784920	4779316	2981517
4680630	4657058	4537000	4537003	4474107
4416771	4416747	4181331	4177198	4062583
4698710	4661775	4634826	4535185	4495917
4813306	4795912	4795833	4775518	4151394
4785792	4769854	4616096	4612918	4498447
4537801	4495917	4709169	4678884	4474084
4678409	4678124	4641446	4490438	4652465

Work Orders (WOs)

4489937	4198697	4198071	3576632	4836432
3535238	4836464			

Miscellaneous

Number	Title	Revision/ Date
EEQ-B389-001	Qualification Tests of Electrical Cables in a Simulated Steam Line Break (SLB) and Loss-of-Coolant Accident (LOCA) Environment	0
EEQ-T020-002	Electrical Equipment Qualification Data File - Target Rock - 82EE-001 & 76HH Series with Soft Seats and 98F-002 with Hard Seats - Solenoid Valves	13
EEQ-B389-001	Electrical Equipment Qualification Data File - Brand-Rex Corporation - 600 Volt, XLPE (Ultrol) Insulation, Hypalon or Neoprene Jacket - Power and Control Cable and SIS Wire	9
EEQ-I206-001	Electrical Equipment Qualification Data File - ITT General Controls - NH-95 - Hydramotor Actuator	8
EEQ-A385-001	Electrical Equipment Qualification Data File - Anaconda Company, Wire and Cable Division - 600 Control Cable with FREP Insulation, CPE Jacket – Cable	10
EEQ-R369-002	Electrical Equipment Qualification Data File – Rosemount - 1153 Series B – Transmitter	19
	Equipment Qualification Program Manual	26
SWMS No. 17-01524	Assessment of the Environmental Qualification Program IP 71111.21N Readiness Inspection Self-Assessment	March 2, 2018
	PVNGS Operations Quality Assurance Program Description	0
EEQ-W120-003	Electrical Equipment Qualification Data File – Westinghouse - WL-24202 and WL-24279 - PAMI EX-CORE Neutron Flux Detector and Preamplifier Filter	12
EEQ-W120-004	Electrical Equipment Qualification Data File – Westinghouse Motor Company - Life Line D (LLD) - Large AC Motors	8
EEQ-R098-002	Electrical Equipment Qualification Data File – Raychem - NMCK8-1L, NMCK8-2L, NMCK8-1Y and NHVT - 5-8kV In-Line and Wye Motor Connection Kit and 5kV Nuclear High Voltage Termination	12
EEQ-S124-001	Electrical Equipment Qualification Data File – Skinner Valve Division, Honeywell, Inc. - V5H Series - Solenoid Valves	13

Miscellaneous

Number	Title	Revision/ Date
EEQ-R098-004	Electrical Equipment Qualification Data File – Raychem Corporation - WCSF-N - In-Line Splice	10
EEQ-D089-001	Electrical Equipment Qualification Data File – Transamerica Delaval, Inc. Gems Sensor Division - XM-54852 and XM-54853 - Liquid Level Transmitter	17
EEQ-R352-001	Electrical Equipment Qualification Data File – Rockbestos - Firewall III Irradiation and Chemically XLPE - 600 Volt Power, Control and Instrumentation Cables and SIS Wire	11
EEQ-L200-001	Limitorque Valve Actuator Qualification for Nuclear Power Station Service – Report 80058 – Tests Conducted Per IEEE 382-197Z, 323-1974, 344-1975	0
EEQ-C515-004	Electrical Equipment Qualification Data File – CONAX - 7371-11000 Series - ECSA (Electric Conductor Seal Assembly)	20
EEQ-N007-001	Electrical Equipment Qualification Data File – Namco Controls - EA180-Series - Limit Switches	21
MEE-00266	Shelf Life for Elastomers, Capacitors, Lubricants and other limited shelf-life items	13
MEE-02212	Commodity Substitution Evaluation	3
MEE-00267	Shelf Life Extension Guidelines	7
VTD-R369-00012	Rosemount Model 1153 Series B Alphaline Pressure Transmitters for Nuclear Service	5
13-NC-MS-0007	MSSS Equipment Qualification Thermal Lag Analysis	5
VTD-SI24-0009	Skinner Valve Options	0
VTD-I204-00036	ASCO General Controls (Formerly ITT Barton, Formerly ITT General Controls) Installation and Maintenance Instructions for NH90 Series Hydramotor Actuators, Model B & Model B1	5
EEQ-B389-001	Qualification Tests of Electrical Cables in a Simulated Steam Line Break (SLB) and Loss-of-Coolant Accident (LOCA) Environment	0
EEQ-T020-002	Electrical Equipment Qualification Data File - Target Rock - 82EE-001 & 76HH Series with Soft Seats and 98F-002 with Hard Seats - Solenoid Valves	13
EEQ-B389-001	Electrical Equipment Qualification Data File - Brand-Rex Corporation - 600 Volt, XLPE (Ultrol) Insulation, Hypalon or Neoprene Jacket - Power and Control Cable and SIS Wire	9
EEQ-I206-001	Electrical Equipment Qualification Data File - ITT General Controls - NH-95 - Hydramotor Actuator	8

Miscellaneous

Number	Title	Revision/ Date
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EEQ-R369-002	Electrical Equipment Qualification Data File – Rosemount - 1153 Series B – Transmitter	19
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EEQ-R098-002	Electrical Equipment Qualification Data File – Raychem - NMCK8-1L, NMCK8-2L, NMCK8-1Y and NHVT - 5-8kV In-Line and Wye Motor Connection Kit and 5kV Nuclear High Voltage Termination	12
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EEQ-D089-001	Electrical Equipment Qualification Data File – Transamerica Delaval, Inc. Gems Sensor Division - XM-54852 and XM-54853 - Liquid Level Transmitter	17
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EEQ-L200-001	Limitorque Valve Actuator Qualification for Nuclear Power Station Service – Report 80058 – Tests Conducted Per IEEE 382-197Z, 323-1974, 344-1975	0
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EEQ-N007-001	Electrical Equipment Qualification Data File – Namco Controls - EA180-Series - Limit Switches	21

Miscellaneous

Number	Title	Revision/ Date
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MEE-02212	Commodity Substitution Evaluation	3
MEE-00267	Shelf Life Extension Guidelines	7
VTD-R369-00012	Rosemount Model 1153 Series B Alphaline Pressure Transmitters for Nuclear Service	5
13-NC-MS-0007	MSSS Equipment Qualification Thermal Lag Analysis	5
VTD-SI24-0009	Skinner Valve Options	0
VTD-I204-00036	ASCO General Controls (Formerly ITT Barton, Formerly ITT General Controls) Installation and Maintenance Instructions for NH90 Series Hydramotor Actuators, Model B & Model B1	5

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
73ST-9CL01	Containment Leakage Type B and C Testing	45
73ST-9DG01	Class 1E Diesel Generator and Integrated Safeguards Test Train A	29
72PY-9RX06	Low Power Physics Testing Using STAR	5
40OP-9ZZ02	Initial Reactor Startup Following Refuelings	61

Work Orders (WOs)

4852735	4972486	4847637

Section 2RS01: Radiological Hazard Assessment and Exposure Controls

Procedures

Number	Title	Revision
75DP-0RP01	Radiation Protection (RP) Program Overview	12
75DP-0RP02	Radioactive Contamination Control	23
75DP-0RP08	Managing Radiological Risk	03
75DP-9RP01	Radiation Exposure and Access Control	21
75RP-0RP01	Radiological Posting and Labeling	35

Procedures

Number	Title	Revision
75RP-9RP02	Radiation Work Permits	32
75RP-9RP07	Radiological Surveys and Air Sampling	30
75RP-9RP10	Conduct of RP Operations	36
75RP-9RP26	Radioactive Source Control	17
75RP-9OP02	Control of High Radiation Areas, Locked High Radiation Areas, and Very High Radiation Areas	31

Condition Reports (CRs)

17-15529	17-15451	17-15162	17-14592	17-15529
17-14592				

Audits, Self-Assessments, and Surveillances

Title	Date
2016 Annual ALARA Report	June 23, 2017
Final 2016 Annual RP Program Summary Report	July 27, 2018

Radiation Work Permits

Number	Title	Revision
3-1004	General Tours, Inspections, and Job Planning Walkdowns.	00
1-1523	Temp Mat Insulation Fiber Inspection	00
3-3306	Primary Side Steam Generator Maintenance	00
3-3319	Reactor Coolant Pump Maintenance	00
3-3521	Inboard Loop Discharge Check Valve Work	00

Miscellaneous

Title	Date
Daily Plant Status Package	April 23, 2018
Radioactive Source Inventory: Units 1, 2, and 3 (Source TRAX)	January 18, 2018
LHRA/VHRA Key Control Inventory for Unit 3	April 23, 2018

Section 2RS03: In-Plant Airborne Radioactivity Control and Mitigation

Procedures

Number	Title	Revision
01DP-0IS08	Basis: PVNGS Respiratory Protection Equipment Usage	21a
01DP-0IS08	PVNGS Respiratory Protection Equipment Usage	20, 21
01DP-0IS10	Basis: PVNGS Respiratory Protection Program	12a
01DP-0IS10	PVNGS Respiratory Protection Program	11,12
75DP-9RP20	Control of Ventilation Units and HEPA Vacuums	4
75RP-0RP05	Control of Portable Air Filtration Systems	6
14FT-9FP79	Compressed Air Cylinder Inspection and Repair	0
14FT-9FP78	Respiratory Protection Equipment Inspection and Repair	3
75RP-9EE07	Operation of the AMS-4 CAM	23
75RP-9RP07	Radiological Surveys and Air Sampling	30
40OP-9CP01	Containment Purge System	27
40OP-9HA01	Auxiliary Building HVAC	32
40OP-9HF01	Fuel Building HVAC	34

Condition Reports (CRs)

16-06099	16-06578	17-01573	17-12846	17-15387
17-15451	18-01854			

Audits, Self-Assessments, and Surveillances

Number	Title	Date
16-06578-008 SA	Self-Assessment: Portable Air Filtration	July 19, 2016
	2016 Annual ALARA Report	June 23, 2017
	Final 2016 Annual RP Program Summary Report	July 27, 2017

Ventilation System HEPA Filter Test

Work Orders	Title	Date
4609100	U3 Aux. Bldg. Normal Exhaust Ventilation	May 17, 2017
4679401	U1 Aux. Bldg. Normal Exhaust Ventilation	November 16, 2016
4682902	U1 Aux. Bldg. Normal Exhaust Ventilation	October 25, 2016

Ventilation System HEPA Filter Test

Work Orders	Title	Date
4643239	U2 Aux. Bldg. Normal Exhaust Ventilation	July 11, 2016
4715991	U2 Aux. Bldg. Normal Exhaust Ventilation	February 6, 2017
4676166	U3 Aux. Bldg. Normal Exhaust Ventilation	July 10, 2017

Miscellaneous

Number	Title
WO 4845756	Supply Temporary Breathing Air
	Nantel: Generic Respiratory Protection Training Student Guide

Section 4OA1: Performance Indicator Verification

Miscellaneous

Number	Title	Revision
13-NS-C075	MSPI Basis Document	9

Section 4OA2: Problem Identification and Resolution

Procedures

Number	Title	Revision
01DP-0XX01	Control and Monitoring of Potential Tornado Borne Missiles	4
40DP-9OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment	44

Condition Reports (CRs)

18-06666	18-06827	18-08278	18-05192	18-07882
18-05427	18-07882	18-09032	18-05858	

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

Procedures

Number	Title	Revision
72OP-9RX01	Calculation of Estimated Critical Condition	31
40AO-9ZZ11	CEA Malfunctions	26

Condition Reports (CRs)

18-08965	18-08963	18-08952	18-08955	18-08909
18-08762	18-08748	18-10686		

Miscellaneous

Title	Date
CEAC1 data printout	May 23, 2018
Event History Report	May 23, 2018

PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, Control Number 31500011. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

This letter and its enclosure will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding.”
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Information Request
February 12, 2018
Notification of Inspection and Request for Information
Palo Verde Nuclear Generating Station Unit 3
NRC Inspection Report 05000530/2018002

INSERVICE INSPECTION DOCUMENT REQUEST

Inspection Dates: April 9–20, 2018
Inspector: James Melfi

A. Information Requested for the In-Office Preparation Week

The following information should be sent to the Region IV office in hard copy or electronic format (ims.certrec.com preferred), in care of James Melfi, by March 26, 2018, to facilitate the selection of specific items that will be reviewed during the onsite inspection week. The inspectors will select specific items from the information requested below and then request from your staff additional documents needed during the onsite inspection week (Section B of this enclosure). We ask that the specific items selected from the lists be available and ready for review on the first day of inspection. Please provide requested documentation electronically if possible. If requested documents are large and only hard copy formats are available, please inform the inspector, and provide subject documentation during the first day of the onsite inspection.

If you have any questions regarding this information request, please call the inspector as soon as possible.

On April 9–20, 2018, a reactor inspector from the Nuclear Regulatory Commission’s (NRC) Region IV office will perform the baseline inservice inspection at Palo Verde Nuclear Generating Station, Unit 3, using NRC Inspection Procedure 71111.08, "Inservice Inspection Activities.” Experience has shown that this inspection is a resource intensive inspection both for the NRC inspector and your staff. The date of this inspection may change dependent on the outage schedule you provide. In order to minimize the impact to your onsite resources and to ensure a productive

inspection, we have enclosed a request for documents needed for this inspection. These documents have been divided into two groups. The first group (Section A of the enclosure) identified information to be provided prior to the inspection to ensure that the inspector is adequately prepared. The second group (Section B of the enclosure) identifies the information the inspector will need upon arrival at the site. It is important that all of these documents are up to date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection.

We have discussed the schedule for these inspection activities with your staff and understand that our regulatory contact for this inspection will be Ms. Lorraine Weaver of your licensing organization. The tentative inspection schedule is as follows:

Preparation week: April 2–6, 2017
Onsite weeks: April 9–20, 2017

Our inspection dates are subject to change based on your updated schedule of outage activities. If there are any questions about this inspection or the material requested, please contact the lead inspector James Melfi at (817) 200-1523. (email to: Jim.Melfi@nrc.gov).

A.1 ISI/Welding Programs and Schedule Information

1. A detailed schedule (including preliminary dates) of:

   1.1. Nondestructive examinations planned for ASME Code Class Components performed as part of your ASME Section XI, risk informed (if applicable), and augmented inservice inspection programs during the upcoming outage.

   1.2. Examinations planned for Alloy 82/182/600 components that are not included in the Section XI scope (If applicable)

   1.3. Examinations planned as part of your boric acid corrosion control program (Mode 3 walkdowns, bolted connection walkdowns, etc.)

   1.4. Welding activities that are scheduled to be completed during the upcoming outage (ASME Class 1, 2, or 3 structures, systems, or components)

2. A copy of ASME Section XI Code Relief Requests and associated NRC safety evaluations applicable to the examinations identified above.

   2.1. A list of ASME Code Cases currently being used to include the system and/or component the Code Case is being applied to.

3. A list of nondestructive examination reports which have identified recordable or rejectable indications on any ASME Code Class components since the beginning of the last refueling outage. This should include the previous Section XI pressure test(s) conducted during start up and any evaluations associated with the results of the pressure tests.

4. A list including a brief description (e.g., system, code class, weld category, nondestructive examination performed) associated with the repair/replacement activities of any ASME Code Class component since the beginning of the last outage and/or planned this refueling outage.

5. If reactor vessel weld examinations required by the ASME Code are scheduled to occur during the upcoming outage, provide a detailed description of the welds to be examined and the extent of the planned examination. Please also provide reference numbers for applicable procedures that will be used to conduct these examinations.

6. Copy of any 10 CFR Part 21 reports applicable to structures, systems, or components within the scope of Section XI of the ASME Code that have been identified since the beginning of the last refueling outage.

7. A list of any temporary non-code repairs in service (e.g., pinhole leaks).

8. Please provide copies of the most recent self-assessments for the inservice inspection, welding, and Alloy 600 programs.

9. Copy of the procedures for welding techniques, and NDE that will be used during the outage.

A.2 Boric Acid Corrosion Control Program

1. Copy of the procedures that govern the scope, equipment and implementation of the inspections required to identify boric acid leakage and the procedures for boric acid leakage/corrosion evaluation.

2. Please provide a list of leaks (including code class of the components) that have been identified since the last refueling outage and associated corrective action documentation. If during the last cycle, the unit was shut down, please provide documentation of containment walkdown inspections performed as part of the boric acid corrosion control program.

A.3 Steam Generator Tube Inspections

1. A detailed schedule of:

   - Steam generator tube inspection, data analyses, and repair activities for the upcoming outage (if occurring).

   - Steam generator secondary side inspection activities for the upcoming outage (if occurring).

2. Copy of SG history documentation given to vendors performing eddy current (ET) testing of the SGs during the upcoming outage.

3. Copy of procedure containing screening criteria used for selecting tubes for in-situ pressure testing and the procedure to be used for in-situ pressure testing.

4. Copy of previous outage SG tube operational assessment. Also include a copy of the following documents as they become available:

   - Degradation assessment
   - Condition monitoring assessment

5. Copy of the document defining the planned SG ET scope (e.g., 100 percent of unrepaired tubes with bobbin probe and 20 percent sample of hot leg expansion transition regions with rotating probe) and identify the scope expansion criteria, which will be applied. Also identify and describe any deviations in this scope or expansion criteria from the EPRI Guidelines.

6. Copy of the document describing the ET acquisition equipment to be applied including ET probe types. Also identify the extent of planned tube examination coverage with each probe type (e.g., rotating probe -0.080 inches, 0.115 inches pancake coils and mid-range +point coil applied at the top-of-tube-sheet plus 3 inches to minus 12 inches).

7. Identify and quantify any SG tube leakage experienced during the previous operating cycle. Also provide documentation identifying which SG was leaking and corrective actions completed and planned for this condition.

8. Copy of steam generator eddy current data analyst guidelines and site validated eddy current technique specification sheets. Additionally, please provide a copy of EPRI Appendix H, “Examination Technique Specification Sheets,” qualification records.

9. Provide past history of the condition and issues pertaining to the secondary side of the steam generators (including items such as loose parts, fouling, top of tube sheet condition, crud removal amounts, etc.).

10. Indicate where the primary, secondary, and resolution analyses are scheduled to take place.

A.4 <u>Additional Information Related to all Inservice Inspection Activities</u>

1. A list with a brief description of inservice inspection, and boric acid corrosion control program related issues (e.g., PVAR) entered into your corrective action program since the beginning of the last refueling outage. For example, a list based upon data base searches using key words related to piping such as inservice inspection, ASME Code, Section XI, NDE, cracks, wear, thinning, leakage, rust, corrosion, boric acid, or errors in piping examinations.

2. Provide training (e.g., Scaffolding, Fall Protection, FME, Confined Space) if they are required for the activities described in A.1 through A.3.

3. Please provide names and phone numbers for the following program leads:

   Inservice inspection (examination, planning)
   Containment exams
   Reactor pressure vessel head exams
   Snubbers and supports
   Repair and replacement program
   Licensing
   Site welding engineer
   Boric acid corrosion control program
   Steam generator inspection activities (site lead and vendor contact)

B. Information to be Provided Onsite to the Inspector(s) at the Entrance Meeting (April 9, 2017):

B.1 Inservice Inspection / Welding Programs and Schedule Information

1. Updated schedules for inservice inspection/nondestructive examination activities, including planned welding activities, and schedule showing contingency repair plans, if available.

2. For ASME Code Class welds selected by the inspector from the lists provided from section A of this enclosure, please provide copies of the following documentation for each subject weld:

   - Weld data sheet (traveler).
   - Weld configuration and system location.
   - Applicable Code Edition and Addenda for weldment.
   - Applicable Code Edition and Addenda for welding procedures.
   - Applicable welding procedures used to fabricate the welds.
   - Copies of procedure qualification records (PQRs) supporting the weld procedures from B.1.b.v.
   - Copies of welder's performance qualification records (WPQ).
   - Copies of the nonconformance reports for the selected welds (If applicable).
   - Radiographs of the selected welds and access to equipment to allow viewing radiographs (if radiographic testing was performed).
   - Copies of the preservice examination records for the selected welds.

- Readily accessible copies of nondestructive examination personnel qualifications records for reviewing.

3. For the inservice inspection related corrective action issues selected by the inspector from section A of this enclosure, provide a copy of the corrective actions and supporting documentation.

4. For the nondestructive examination reports with relevant conditions on ASME Code Class components selected by the inspector from Section A above, provide a copy of the examination records, examiner qualification records, and associated corrective action documents.

5. A copy of (or ready access to) most current revision of the inservice inspection program manual and plan for the current interval.

6. For the nondestructive examinations selected by the inspector from section A of this enclosure, provide a copy of the nondestructive examination procedures used to perform the examinations (including calibration and flaw characterization/sizing procedures). For ultrasonic examination procedures qualified in accordance with ASME Code, Section XI, Appendix VIII, provide documentation supporting the procedure qualification (e.g., the EPRI performance demonstration qualification summary sheets). Also, include qualification documentation of the specific equipment to be used (e.g., ultrasonic unit, cables, and transducers including serial numbers) and nondestructive examination personnel qualification records.

B.2 Boric Acid Corrosion Control Program

1. Please provide boric acid walk down inspection results, an updated list of boric acid leaks identified so far this outage, associated corrective action documentation, and overall status of planned boric acid inspections.

2. Please provide any engineering evaluations completed for boric acid leaks identified since the end of the last refueling outage. Please include a status of corrective actions to repair and/or clean these boric acid leaks. Please identify specifically which known leaks, if any, have remained in service or will remain in service as active leaks.

B.3 Steam Generator Tube Inspections

1. Copies of the Examination Technique Specification Sheets and associated justification for any revisions.

2. Please provide a copy of the eddy current testing procedures used to perform the steam generator tube inspections (specifically calibration and flaw characterization/sizing procedures, etc.).

3. Copy of the guidance to be followed if a loose part or foreign material is identified in the steam generators.

4. Identify the types of SG tube repair processes which will be implemented for defective SG tubes (including any NRC reviews/evaluations/approvals of this repair process). Provide the flaw depth sizing criteria to be applied for ET indications identified in the SG tubes.

5. Copy of documents describing actions to be taken if a new SG tube degradation mechanism is identified.

6. Provide procedures with guidance/instructions for identifying (e.g. physically locating the tubes that require plugging) and plugging SG tubes.

7. List of corrective action documents generated by the vendor and/or site with respect to steam generator inspection activities.

B.4 Codes and Standards

1. Ready access to (i.e., copies provided to the inspector(s) for use during the inspection at the onsite inspection location, or room number and location where available):

   - Applicable Editions of the ASME Code (Sections V, IX, and XI) for the inservice inspection program and the repair/replacement program.

2. Copy of the performance demonstration initiative (PDI) generic procedures with the latest applicable revisions that support site qualified ultrasonic examinations of piping welds and components (e.g., PDI-UT-1, PDI-UT-2, PDI-UT-3, PDI-UT-10, etc.).

3. Boric Acid Corrosion Guidebook Revision 1 – EPRI Technical Report 1000975.

The following items are requested for the
Occupational Radiation Safety Inspection
at Palo Verde Nuclear Generating Station
April 23–27, 2018
Integrated Report 2018002

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **April 17, 2018**

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.0**1** should be in a file/folder titled "**1**- A," applicable organization charts in file/folder "**1**- B," etc.

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

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

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

If you have any questions or comments, please contact Louis Carson at (817)200-1221, Louis.Carson@nrc.gov or Shawn Money at (817) 200-1466, Shawn.Money@nrc.gov

1. Radiological Hazard Assessment and Exposure Controls (71124.01) and Performance Indicator Verification (71151)
Date of Last Inspection: **October 16, 2017**

A. List of contacts and telephone numbers for the Radiation Protection Organization Staff and Technicians

B. Applicable organization charts

C. Audits, self-assessments, and LERs written since date of last inspection, related to this inspection area

D. Procedure indexes for the radiation protection procedures

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
1. Radiation Protection Program Description
2. Radiation Protection Conduct of Operations
3. Personnel Dosimetry Program
4. Posting of Radiological Areas
5. High Radiation Area Controls
6. RCA Access Controls and Radworker Instructions
7. Conduct of Radiological Surveys
8. Radioactive Source Inventory and Control
9. Declared Pregnant Worker Program

F. List of corrective action documents (including corporate and subtiered systems) since date of last inspection
a. Initiated by the radiation protection organization
b. Assigned to the radiation protection organization

NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

If not covered above, a summary of corrective action documents since date of last inspection involving unmonitored releases, unplanned releases, or releases in which any dose limit or administrative dose limit was exceeded (for Public Radiation Safety Performance Indicator verification in accordance with IP 71151)

G. List of radiologically significant work activities scheduled to be conducted during the inspection period (If the inspection is scheduled during an outage, please also include a list of work activities greater than 1 rem, scheduled during the outage with the dose estimate for the work activity.)

H. List of active radiation work permits

I. Radioactive source inventory list
a. All radioactive sources that are required to be leak tested
b. All radioactive sources that meet the 10 CFR Part 20, Appendix E, Category 2 and above threshold. Please indicate the radioisotope, initial and current activity (w/assay date), and storage location for each applicable source.

J. The last two leak test results for the radioactive sources inventoried and required to be leak tested. If applicable, specifically provide a list of all radioactive source(s) that have failed its leak test within the last two years

K. A current listing of any non-fuel items stored within your pools, and if available, their appropriate dose rates (Contact / @ 30cm)

L. Computer printout of radiological controlled area entries greater than 100 millirems since the previous inspection to the current inspection entrance date. The printout should include the date of entry, some form of worker identification, the radiation work permit used by the worker, dose accrued by the worker, and the electronic dosimeter dose alarm setpoint used during the entry (for Occupational Radiation Safety Performance Indicator verification in accordance with IP 71151).

3. In-Plant Airborne Radioactivity Control and Mitigation (71124.03)
Date of Last Inspection: **April 22, 2016**

A. List of contacts and telephone numbers for the following areas:
   1. Respiratory Protection Program
   2. Self-contained breathing apparatus

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support (SCBA), and LERs, written since date of last inspection related to:
   1. Installed air filtration systems
   2. Self-contained breathing apparatuses

D. Procedure index for:
   1. Use and operation of continuous air monitors
   2. Use and operation of temporary air filtration units
   3. Respiratory protection

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
   1. Respiratory protection program
   2. Use of self-contained breathing apparatuses
   3. Air quality testing for SCBAs
   4. Use of installed plant systems, such as containment purge, spent fuel pool ventilation, and auxiliary building ventilation

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the Airborne Monitoring program including:
   1. Continuous air monitors
   2. Self-contained breathing apparatuses
   3. Respiratory protection program

   NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

G. List of SCBA qualified personnel - reactor operators and emergency response personnel

H. Inspection records for self-contained breathing apparatuses (SCBAs) staged in the plant for use since date of last inspection.

I. SCBA training and qualification records for control room operators, shift supervisors, STAs, and OSC personnel for the last year.

A selection of personnel may be asked to demonstrate proficiency in donning, doffing, and performance of functionality check for respiratory devices

J. List of respirators (available for use) by type (APR, SCBA, PAPR, etc.), manufacturer, and model.

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