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

August 8, 2017

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

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000528/2017002, 05000529/2017002, AND 05000530/2017002

Dear Mr. Bement:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station Units 1, 2, and 3. On July 6, 2017, the NRC inspectors discussed the results of this inspection with Mr. J. Cadogan and other members of your staff. The results of this inspection are documented in the enclosed report.

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

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

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

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

Enclosure:
Inspection Report 05000528/2017002,
05000529/2017002, 05000530/2017002
w/ Attachments:
1. Supplemental Information
2. Information Request for the
Inservice Inspection (ISI) Activities

PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000528/2017002, 05000529/2017002, AND 05000530/2017002 – DATED AUGUST 8, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000528, 05000529, 05000530
License:	NPF-41, NPF-51, NPF-74
Report:	05000528/2017002, 05000529/2017002, and 05000530/2017002
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station
Location:	5801 South Wintersburg Road Tonopah, AZ 85354
Dates:	April 1 through June 30, 2017
Inspectors:	C. Peabody, Senior Resident Inspector D. Reinert, PhD, Resident Inspector D. You, Resident Inspector B. Correll, Senior Project Engineer W. Sifre, Senior Reactor Inspector E. Uribe, Project Engineer
Approved By:	Geoffrey B. Miller Chief, Project Branch D Division of Reactor Projects

SUMMARY

IR 05000528, 529, 530/2017002, 4/1/2017 – 6/30/2017; PALO VERDE NUCLEAR GENERATING STATION INTEGRATED INSPECTION REPORT; Follow Up of Events and Notices of Enforcement Discretion.

The inspection activities described in this report were performed between April 1, 2017, and June 30, 2017, by the resident inspectors at Palo Verde Nuclear Generating Station and inspectors from the NRC's Region IV office and other NRC offices. One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated July 2016.

Cornerstone: Barrier Integrity

- Green. The inspectors reviewed a Green self-revealing non-cited violation of Technical Specification 3.6.3 Condition C for exceeding the allowed outage time of 4 hours to isolate the flow path of an inoperable containment isolation valve. Specifically, Unit 1 containment isolation valve SG-1134 was inoperable from June 28, 2016, to September 21, 2016, due to improper restoration from planned maintenance. The licensee entered this condition in their corrective action program and performed a Level 2 cause analysis under Condition Report 16-14896. The licensee also undertook immediate actions to restore the valve from the neutral position and remotely stroke the valve per procedure.

  The inspectors concluded the failure to restore Unit 1 containment isolation valve SG-1134 from maintenance in accordance with station procedures was a performance deficiency. The performance deficiency was more-than-minor and a finding because it is associated with the configuration control attribute of maintaining functionality of containment under the Barrier Integrity cornerstone which affects the cornerstone objective to provide reasonable assurance that physical design barriers will protect the public from radionuclide releases caused by accidents or events. Specifically, the inoperability of this containment isolation valve allowed the potential of a radioactive release during a design basis accident. The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," Issue Date: 05/06/04. Section 4.1 determined this to be a Type B finding since the degraded condition did not affect the likelihood of core damage. Table 4.1 shows that containment isolation valves in lines connecting reactor coolant systems to environments with small lines would not contribute to large early release frequency. Since valve SG-1134 is a small (one-inch) valve, this finding screened to Green using the flow chart in Figure 4.1 "LERF-based Significance Determination Process." This finding has a cross-cutting aspect in the area of human performance associated with the documentation component. Specifically, the licensee failed to provide a work package that was complete, thorough, accurate, and current in accordance with station procedure 40OP-09OP01, "Operation of Air Operated Valves," when returning SG-1134 to its normal operating condition following

maintenance. As a result, the valve handwheel was left out of neutral, thereby preventing remote operation [H.7]. (Section 4OA3.2)

Licensee-Identified Violations

A violation of very low safety significance was identified by the licensee and has been reviewed by the inspector. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and associated corrective action tracking number are listed in Section 4OA7 of this report.

PLANT STATUS

Units 1 operated at full power for the entire inspection period.

Unit 2 entered the inspection period at full power. Unit 2 shut down for a refueling outage on April 8, 2017. Unit 2 was restarted on May 8, 2017, and returned to full power. On May 30, 2017, a feedwater heating transient resulted in a power increase to 101 percent then decrease to 96 percent for same day repairs. Unit 2 operated for the remainder of inspection period at full power.

Unit 3 entered the inspection period at full power. Unit 3 was shut down for a planned maintenance to replace two leaking steam flow transmitter hoses on May 9, 2017. This outage was extended to clean boric acid from past reactor coolant pump seal leakage. Unit 3 was restarted on May 14, 2017, and returned to full power. On June 19, 2017, Unit 3 main turbine was manually tripped due to loss of main transformer cooling resulting in an automatic reactor cutback and subsequent down-power to 10 percent. Transformer cooling was restored and Unit 3 reconnected to the electrical grid on June 20, 2017, and returned to full power. Unit 3 operated for the remainder of inspection period at full power.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Summer Readiness for Offsite and Alternate AC Power Systems

a. Inspection Scope

On May 12, 2017, the inspectors completed an inspection of the station's off-site and alternate-ac power systems. The inspectors inspected the material condition of these systems, including transformers and other switchyard equipment, to verify that plant features and procedures were appropriate for operation and continued availability of off-site and alternate-ac power systems. The inspectors reviewed outstanding work orders and open condition reports for these systems. The inspectors walked down the switchyard to observe the material condition of equipment providing off-site power sources.

The inspectors verified that the licensee's procedures included appropriate measures to monitor and maintain availability and reliability of the off-site and alternate-ac power systems.

These activities constituted one sample of summer readiness of off-site and alternate-ac power systems, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On April 3, 2017, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for seasonal high temperatures, and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of hot weather, the licensee had corrected weather-related equipment deficiencies identified during the previous summer season.

The inspectors selected two risk-significant systems that were required to be protected from seasonal high temperatures.

- Essential spray pond system
- Control building essential ventilation system

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

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walk-Down

a. Inspection Scope

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

- April 5, 2017, Unit 2 essential cooling water system A
- April 12, 2017, Unit 2 shutdown cooling system B
- April 19, 2017, Unit 2 spent fuel pool cooling systems A and B
- May 11, 2017, Unit 2 essential spray pond system A

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

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

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

- April 10, 2017, Unit 1 control room, fire zone 17
- April 11, 2017, Unit 2 essential switchgear A room, fire zone 5A
- May 12, 2017, Unit 2 diesel generator A room, fire zone 21A
- May 22, 2017, Unit 3 Class 1E battery A and C rooms, fire zones 8A and 9A
- May 22, 2017, Unit 3 Class 1E battery B and D rooms, fire zones 8B and 9B

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

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

b. Findings

No findings were identified.

.2 Annual Inspection

a. Inspection Scope

On April 11, 2017, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of an announced fire drill for training on April 6, 2017.

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

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

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

The activities described in subsections 1 through 4 below constitute completion of one inservice inspection sample, as defined in Inspection Procedure 71111.08.

.1 Non-Destructive Examination Activities and Welding Activities

a. Inspection Scope

The inspector directly observed the following nondestructive examinations:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Main Steam	2-P-SGF-156 Weld 61-17	Ultrasonic
Main Steam	2-P-SGF-156 Weld 61-16	Ultrasonic
Main Steam	2-P-SGF-156 Weld 61-15	Ultrasonic
Main Steam	2-P-SGF-156 Weld 61-14	Ultrasonic
Main Steam	2-P-SGF-155 Weld 50-28	Magnetic Particle
Main Steam	2-P-SGF-155 Weld 50-27	Magnetic Particle
Main Steam	2-P-SGF-155 Weld 50-19	Magnetic Particle
Main Steam	2-P-SGF-155 Weld 50-20	Magnetic Particle
Safety Injection	2-P-SIF-105 Weld 39-53	Ultrasonic
Safety Injection	2-P-SIF-105 Weld 39-29	Ultrasonic
Safety Injection	2-P-SIF-105 Weld 39-28	Ultrasonic
Safety Injection	2-P-SIF-105 Weld 39-12	Ultrasonic

The inspector reviewed records for the following nondestructive examinations:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Main Steam	2-P-SGF-156 Weld 61-17	Magnetic Particle
Main Steam	2-P-SGF-156 Weld 61-16	Magnetic Particle
Main Steam	2-P-SGF-156 Weld 61-15	Magnetic Particle
Main Steam	2-P-SGF-156 Weld 61-14	Magnetic Particle
Main Steam	2-P-SGF-155 Weld 50-25	Magnetic Particle
Main Steam	2-P-SGF-155 Weld 50-24	Magnetic Particle
Main Steam	2-P-SGF-155 Weld 50-16	Magnetic Particle

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Main Steam	2-P-SGF-155 Weld 50-15	Magnetic Particle
Safety Injection	2-P-SIF-105 Weld 39-27	Ultrasonic
Safety Injection	2-P-SIF-105 Weld 39-22	Ultrasonic
Reactor Vessel Head Vent Valve to Reactor Drain Tank	17-0337	Liquid Penetrant
Reactor Vessel Head Vent Valve to Reactor Drain Tank	17-0336	Liquid Penetrant
Pressurizer Vent Valve to Reactor Drain Tank	17-0338	Liquid Penetrant
Pressurizer Vent Valve to Reactor Drain Tank	17-0339	Liquid Penetrant
Chemical and Volume Control – Seal Injection B Inlet Isolation Bypass Valve	17-0284	Liquid Penetrant
Pressurizer Nozzle Weld Overlay	2-P-RCF-101 Weld 5-34-OL	Ultrasonic
Spent Fuel Pool Cooling Sample Valve	17-0447	Radiography
Spent Fuel Pool Cooling Sample Valve	17-0447	Radiography

During the review and observation of each examination, the inspector observed whether activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspector also reviewed the qualifications of all nondestructive examination technicians performing the inspections to determine whether they were current.

The inspector reviewed records for the following welding activities:

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Pressurizer Vent Valve to Reactor Drain Tank	Work Order 4731249, Valve 2JRCBHV0108	Gas Tungsten Arc Weld
Pressurizer Vent Valve to Reactor Drain Tank	Work Order 4731250, Valve 2JRCBHV0109	Gas Tungsten Arc Weld
Reactor Vessel Head Vent Valve to Reactor Drain Tank	Work Order 4731548, Valve 2JRCAHV0101	Gas Tungsten Arc Weld

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Reactor Vessel Head Vent Valve to Reactor Drain Tank	Work Order 4731549, Valve 2JRCAHV0102	Gas Tungsten Arc Weld
Steam Generator 1 Downcomer Blowdown Valve	Work Order 4272281, Valve 2JSGBUV0228	Gas Tungsten Arc Weld
Chemical and Volume Control – Seal Injection B Inlet Isolation Bypass Valve	Work Order 4677309, Valve 2PCHNV1001	Gas Tungsten Arc Weld

The inspector reviewed whether the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX, requirements. The inspector also evaluated whether essential variables were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications.

b. Findings

No findings were identified.

.2 Vessel Upper Head and Bottom Mounted Instrument Nozzle Penetration Inspection Activities

a. Inspection Scope

The inspector reviewed the results of the licensee's bare metal visual inspection of the reactor vessel upper head and bottom mounted instrument nozzle penetrations to determine whether the licensee identified any evidence of boric acid challenging the structural integrity of the reactor head components, bottom mounted instrument nozzles, and attachments. The inspector also verified that the required inspection coverage was achieved and limitations were properly recorded. The inspector reviewed whether the personnel performing the inspection were certified examiners to their respective nondestructive examination method.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities

a. Inspection Scope

The inspector reviewed the licensee's implementation of its boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspector reviewed the documentation associated with the boric acid corrosion control walk-down as specified in Procedures 73DP-9ZC01, "Boric Acid Corrosion Control Program," Revision 7 and 70TI-9ZC01, "Boric Acid

Walkdown Leak Detection," Revision 19. The inspector reviewed whether the visual inspections emphasized locations where boric acid leaks could cause degradation of safety-significant components and whether engineering evaluation used corrosion rates applicable to the affected components and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity. The inspector observed whether corrective actions taken were consistent with the ASME Code and 10 CFR Part 50, Appendix B, requirements.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

The inspector reviewed the steam generator tube eddy current examination scope and expansion criteria to determine whether these criteria met technical specification requirements, EPRI guidelines, and commitments made to the NRC. The inspector also reviewed whether the eddy current examination inspection scope included areas of degradations that were known to represent potential eddy current test challenges, such as the top of tube sheet, tube support plates, and U-bends. The inspector confirmed that no repairs were required at the time of the inspection.

Steam Generator Inspection

- The inspector verified that the number and sizes of steam generator tube flaws/degradation identified were consistent with the licensee's previous outage operational assessment predictions.

- The inspector verified that steam generator eddy current examination scope and expansion criteria met technical specification requirements.

- The inspector verified that eddy current probes and equipment configurations used to acquire data from the steam generator tubes were qualified to detect the known/expected types of steam generator tube degradation in accordance with Appendix H, "Performance Demonstration for Eddy Current Examination of EPRI Document 1013706."

The inspector reviewed the licensee's identification of the following tube degradation mechanisms:

- Tube support plate wear
- Foreign object wear

Secondary Side Inspections

- The inspector reviewed secondary side inspection results and verified the licensee took corrective actions in response to the observed degradation.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspector reviewed 47 condition reports that dealt with inservice inspection activities and determined the licensee implemented appropriate corrective actions for inservice inspection issues. From this review, the inspector concluded that the licensee has an appropriate threshold for entering inservice inspection issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying industry inservice inspection operating experience. Specific documents reviewed during this inspection are listed in the attachment.

b. Findings

No findings were identified.

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

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On June 13, 2017, the inspectors observed simulator training for an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

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

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On April 7, 2017, the inspectors observed the performance of on-shift licensed operators in the plant's Unit 2 main control room. At the time of the observations, the plant was in a period of heightened activity due to a planned reactor shutdown for a refueling outage. The inspectors observed the operators' performance of the following activities:

- Pre-job Brief
- Reactivity control, including boration and control element assembly insertion
- Controlling of main turbine load to maintain reactor temperature

- Manual reactor trip from 20 percent power
- Completion of standard post trip review actions

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

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

Routine Maintenance Effectiveness

a. Inspection Scope

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

- June 19, 2017, Unit 2 high pressure safety injection valve 660 inservice testing failure

- June 20, 2017, Unit 2 high pressure safety injection pump B high vibrations during inservice testing

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

These activities constituted completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- April 11, 2017, Unit 2 daily shutdown risk assessment during reactor coolant system reduced time to boil conditions

- May 2, 2017, Unit 2 daily shutdown risk assessment during restoration of the reactor coolant system

- June 2, 2017, Unit 3 weekly risk assessment with yellow risk condition for train A engineered safeguards features actuation system relay testing

- June 15, 2017, Unit 2 weekly risk assessment for high pressure safety injection pump B motor testing

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

The inspectors also observed portions of two emergent work activities that had the potential to cause an initiating event, to affect the functional capability of mitigating systems, or to impact barrier integrity:

- May 5, 2017, Unit 2 applying Technical Specification 3.0.4.b risk assessment for transitioning from Mode 5 to Mode 3 with atmospheric dump valves 178 and 185 inoperable

- June 1, 2017, Unit 3 unplanned inoperability of main steam isolation valve 170 and plant protection system steam generator low level channel A inoperable

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

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

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

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

- April 25, 2017, Unit 2 operability determination of auxiliary feedwater pump A valve body crack

- May 1, 2017, Unit 2 operability determination of safety injection tank vent hand switch

- May 3, 2017, Unit 2 operability determination of high pressure safety injection pump B high vibrations during inservice testing

- May 11, 2017, Unit 3 operability determination of reactor coolant pump 1A seal inactive boric acid leakage

- May 17, 2017, Unit 3 operability determination of condensate storage tank during temporary system alteration to clean up sodium using portable equipment

- May 25, 2017, Unit 1 operability determination of diesel generator A after engine did not complete automatic cooldown cycle

- June 22, 2017, Unit 3 operability determination of atmospheric dump valve 178 failing to go fully closed during surveillance testing

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

These activities constituted completion of seven operability and functionality review samples as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

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

- April 12, 2017, Unit 2 reactor coolant system temporary diesel driven pump for secondary injection defense in depth during refueling outage

- May 17, 2017, Unit 3 condensate storage tank temporary modification to clean up sodium contamination

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

These activities constituted completion of two samples of temporary modifications, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- April 28, 2017, Unit 2 high pressure safety injection pump B high vibrations on outboard bearing
- May 2, 2017, Unit 2 containment spray pump A testing following impeller replacement
- May 3, 2017, Unit 2 pressurizer main spray valve 100E functional stroke test following actuator replacement
- June 8, 2017, station blackout generator 1 start and load testing following ignition system solenoid replacement
- June 14, 2017, Unit 2 safety related battery charger testing following preventive maintenance
- June 15, 2017, Unit 2 high pressure safety injection pump B mini-flow testing following motor preventive maintenance

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 Refueling Outage

a. Inspection Scope

During the station's Unit 2 refueling outage that concluded on May 8, 2017, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan prior to the outage
- Review and verification of the licensee's fatigue management activities
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities
- Monitoring of outage control center activities
- Walkdown of plant areas inside containment
- Observation and review of fuel handling activities
- Monitoring of heat-up and startup activities

These activities constituted completion of one refueling outage sample as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

.2 Elective Maintenance Outage

a. Inspection Scope

Between November 2016 and April 2017, Unit 3 required isolation of multiple steam flow transmitters used in the reactor feedwater control system. The feedwater control system is a power generation system that is independent of and completely separate from the plant protection system which automatically shuts down the reactor when accident conditions are detected. The braided hoses that connect the instrument to the transmitter had developed significant leakage requiring at power containment entries to isolate the transmitters. Normally the feedwater control system runs in the three element control mode where it monitors steam generator water level, steam flow from the steam generators, and feedwater flow to the steam generators. The system then calculates the correct amount of feedwater flow to maintain the steam generators at the desired steady state water level. However, with two of the four steam flow transmitters isolated the remaining two transmitters became single point vulnerabilities to plant level events. If either of the remaining transmitters failed, the system would transfer to single element feedwater control using only steam generator level inputs. This control mode is slower to respond and less reliable at maintaining steam generator level control during anticipated transients or changing plant conditions. Most likely operating the reactor in single element mode for an extended period of time would result in a Reactor Trip on Low or High Steam Generator Water Level. The licensee took prudent action to shut down on May 9, 2017, to repair the condition by replacing all four of the affected

instrument hoses.

When shutdown for the repairs, operators inspecting containment for indications of boric acid leakage found inactive, but apparent former leakage from the reactor coolant pump 1A seal package. The boric acid cleanup activities, and engineering evaluation of the seal package extended the outage. Operators held the unit in Mode 3 to allow direct visual monitoring of the seal at normal operating pressure and temperature in order to verify that there was no active leakage across the seal before the reactor was restarted. A monitoring plan to detect any recurrence of leakage in a timely manner was also developed prior to restart on May 14, 2017.

The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately monitored critical shutdown safety functions, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan prior to the outage
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities
- Monitoring of outage control center activities
- Walkdown of plant areas inside containment
- Observation of Plant Review Board seal acceptance and restart considerations
- Monitoring of heat-up and startup activities

These activities constituted completion of one outage activities sample, as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

In-service tests:

- April 30, 2017, Unit 2 high pressure safety injection pump B full flow test
- June 15, 2017, Unit 1 low pressure safety injection pump B test

Containment isolation valve surveillance tests:

- April 19, 2017, Unit 2 local leak rate test of penetration 31 (Instrument Air Containment Isolation Valve)

Other surveillance tests:

- April 11, 2017, Unit 2 engineered safeguards features actuation system integrated safeguards functional testing

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

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

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on June 27, 2017, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the technical support center, and attended the post-drill critique. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

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

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (MS05)

a. Inspection Scope

For the period of January 1, 2016, through March 31, 2017, the inspectors reviewed licensee event reports (LERs), maintenance rule evaluations, and other records that could indicate whether safety system functional failures had occurred. The inspectors

used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73," Revision 3, to determine the accuracy of the data reported.

These activities constituted verification of the safety system functional failures performance indicator Units 1, 2, and 3, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Emergency AC Power Systems (MS06) High Pressure Injection Systems (MS07), Heat Removal Systems (MS08), Residual Heat Removal Systems (MS09), and Cooling Water Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of April 1, 2016, through March 31, 2017, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for emergency ac power systems, high pressure injection systems, heat removal systems, residual heat removal systems, and cooling water systems for Units 1, 2, and 3, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

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

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

b. Observations and Assessments

The licensee is taking actions to address equipment reliability concerns following a number of consequential events in 2016 and 2017. The following impactful events have caused major equipment outages and/or unplanned down power events:

- September 7, 2016, Unit 1 pressurizer spray valve fails open resulting in a reactor trip
- September 19, 2016, a failed control element motor generator set speed sensor diode failure causes Unit 3 turbine trip followed by a reactor cutback and discretionary reactor trip
- December 12, 2016, Unit 3 diesel generator B catastrophic failure requiring two license amendments to continue operating and two months to affect repairs
- January 11, 2017, station blackout generator 2 fails to start due to incorrectly configured ignition system fuel boost settings
- May 9, 2017, Unit 3 multiple failures of steam generator flow transmitter braided hoses requires a short notice outage to repair; this leakage also obscured a leaking RCP seal
- May 16, 2017, Units 1, 2, and 3 condensate storage tanks affected by a sodium intrusion in the demineralized water supply
- June 6, 2017, station blackout generator 1 fails to start due to a failed solenoid valve in the ignition system
- June 19, 2017, Unit 3 faulty power supply termination results in loss of main transformer cooling, a turbine trip, reactor cutback, and subsequent down power to 10 percent power

- June 29, 2017, Unit 3 normal chillers A, B, and C secured or tripped results in total loss of HVAC abnormal operating procedure entry and monitoring of technical specification limits for containment temperature; Unit 2 also lost two of three normal chillers on June 20, 2017, under similar circumstances

The inspectors concluded the station has taken or is in the process of taking appropriate corrective actions in a timely manner. The station is developing an "Excellence Plan for Equipment Reliability." The inspectors will continue to monitor the licensee's efforts at addressing equipment reliability issues.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

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

- June 19, 2017, station blackout system program health

  The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to address the conditions.

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

b. Findings

No findings were identified.

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

.1 (Closed) Licensee Event Report (LER) 05000530/2016-001-00, 05000530/2016-001-01, Control Room Essential Filtration System Air Filtration Unit Failure Resulting in a Condition Prohibited by Technical Specifications

On July 20, 2016, the licensee received carbon sample results for the Unit 3 control room essential air filtration unit (AFU) B that exceeded the acceptance criteria of the Technical Specification (TS) Ventilation Testing Program. Unit 3 control room operators declared the AFU inoperable and entered TS Limiting Condition for Operation (LCO) 3.7.11 Condition A. The licensee replaced the carbon filter and following testing, declared the AFU operable on July 24, 2016. The licensee conducted an engineering evaluation and determined that the AFU had been inoperable since December 17, 2015, which exceed TS 3.7.11 required action completion time for LCO Conditions A and C on December 24, 2015 and LCO Condition E during the movement of irradiated fuel.

The licensee's investigation concluded that the direct cause of the AFU failure was exposure to a high amount of volatile organic compounds (VOCs) during a control room renovation project. The apparent cause was a lack of knowledge and recognition by licensee personnel to identify and mitigate all potential sources of VOCs. The licensee revised their design change procedures to ensure that replacement flooring and furniture are evaluated as potential sources of VOCs prior to their introduction into the control room. The inspectors reviewed the licensee event report and supplement, cause evaluation 16-11650-005, and other corrective action documentation, including the licensee's extent of condition investigation and test records for the replacement carbon filter. No findings or violations of NRC requirements were identified.
LERs 05000530/2016-001-00 and 05000530/2016-001-01 are closed.

.2 (Closed) LER 05000528/2016-003-00, Inoperable Containment Isolation Valve SGA-UV-1134 Due to Failure to Close during Testing

a. Event Summary

On September 21, 2016, steam trap inlet containment isolation valve SGA-UV-1134 failed to stroke closed from the control room during testing. The failure resulted in an unplanned entry into TS LCO 3.6.3, Containment Isolation Valves, Condition C. On September 22, 2016, it was concluded the valve was in a configuration that rendered the pneumatic operator incapable of operating the valve. The valve had been in this configuration since last operated on June 28, 2016. An evaluation concluded that the valve was inoperable for longer than the required 4-hour completion time of LCO 3.6.3 Condition C. The same day, the valve was properly closed, declared operable and the LCO was exited. The inspectors reviewed the licensee event report, cause evaluation 16-14896, and other corrective action documentation and reviewed the below self-revealed finding associated with valve SG-1134. LER 05000528/2016-003-00 is closed.

b. Findings

Inoperable Containment Isolation Valve Due to Not Operating Valve in Accordance with Station Procedures

Introduction. The inspectors reviewed a Green, self-revealed, non-cited violation of Technical Specification 3.6.3, LCO Condition C, for exceeding the allowed outage time of 4 hours to isolate the flow path of an inoperable containment isolation valve. Specifically, Unit 1 steam trap inlet containment isolation valve SG-1134 was inoperable from June 28, 2016, to September 21, 2016, due to improper restoration from planned maintenance.

Description. On June 28, 2016, Unit 1 performed a pressure drop test on air operated valve SG-1134, steam trap inlet containment isolation valve. Work order TD 210323 directed the valve to be unlocked before being cycled open and shut. After successful completion of the pressure drop test, restoration work order TD 211249 directed operators to lock the valve in the open position. The operator fully opened the valve to the backseat and installed the locking device. This left the valve in a condition that prevented remote operation from the control room, rendering the valve inoperable.

Proper restoration of this type of air operated valve (Valtek Mark One Actuator) is

specified in station procedure 40OP-09OP01, “Operation of Air Operated Valves,” Revision 2. Section M.1.5.1 of this procedure provides steps to properly position the handwheel to prevent manual disarming of the actuator. Step M.1.5.1.2 directs the operator to “fully close the valve, then rotate the handwheel counterclockwise (open) to ¼ to ½ of a turn.” This action prevents the valve from being backseated and ensures the valve handwheel is in a neutral position, allowing for remote operation of the valve.

Valve SG-1134 was backseated and incapable of remote operation until September 21, 2016, when a routine surveillance test to stroke the valve remotely resulted in a failure to close. Operators declared the valve inoperable. Licensee troubleshooting efforts identified that the valve handwheel was not in the neutral position. Operators manually re-positioned the valve handwheel to the neutral setting, and the valve stroked successfully.

The licensee’s apparent cause analysis report 16-14896-004 found that the operators had not used station procedure 40OP-09OP01, “Operation of Air Operated Valves,” to restore valve SG-1134 to operation following the pressure drop test. The restoration work order TD 211249 did not reference the station procedure when directing the operators to open and lock the valve. The licensee’s past operability evaluation concluded that valve SG-1134 was inoperable from June 28, 2016, to September 21, 2016.

Analysis. The failure to restore containment isolation valve SG-1134 from maintenance in accordance with station procedure 40OP-09OP01 was a performance deficiency. The performance deficiency was more-than-minor and a finding because it is associated with the configuration control attribute of maintaining functionality of containment under the Barrier Integrity cornerstone, and it adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers will protect the public from radionuclide releases caused by accidents or events. Specifically, the inoperability of containment isolation valve SG-1134 allowed the potential for a radioactive release during a design basis accident. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix H, “Containment Integrity Significance Determination Process,” Issued May 6, 2004. Section 4.1 determined this to be a Type B finding since the degraded condition did not affect the likelihood of core damage. Table 4.1 shows that containment isolation valves in lines connecting the reactor coolant system to the environment with small lines would not contribute to LERF [large early release frequency]. Since valve SG-1134 is a small (one-inch) valve, this finding screened to Green using the flow chart in Figure 4.1 “LERF-based Significance Determination Process.” The finding has a cross-cutting aspect in the area of human performance associated with the documentation component. Specifically, the licensee failed to provide a work package that was complete, thorough, accurate, and current when it failed to ensure operators used station procedure 40OP-09OP01, “Operation of Air Operated Valves,” when returning valve SG-1134 to its normal operating condition following maintenance. As a result, the valve handwheel was left out of neutral, thereby preventing remote operation [H.7]

Enforcement. Technical Specification 3.6.3 LCO Condition C states, for an inoperable containment isolation valve, the containment penetration flow path for a penetration requiring one containment isolation valve must be isolated within four hours. Contrary to the above, from June 28, 2016, to September 21, 2016, the licensee did not isolate a containment penetration flow path for a penetration requiring one containment isolation

valve within 4 hours for an inoperable containment isolation valve. Specifically, Unit 1 valve SG-1134 was inoperable and operators did not isolate the flow path through the associated containment penetration during that time. The inoperability of valve SG-1134 was the result of a failure by operators to use station procedure 40OP-09OP01 when returning the valve to service following maintenance. The licensee's immediate corrective action was to shut the upstream valve (SGE-V092) to comply with Technical Specifications. Operations then restored valve SG-1134 to its normal operating state per procedure. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report 16-14896, this violation is being treated as a non-cited violation in accordance with Section 2.3.2.a of the Enforcement Policy: NCV 05000528/2017002-01, "Inoperable Containment Isolation Valve Due to Not Operating Valve in Accordance with Station Procedures."

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

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 25, 2017, the inspector presented the inspection results to Mr. J. Cadogan, Senior Vice President, Site Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspector had been returned or destroyed.

On July 6, 2017, the inspectors presented the inspection results to Mr. J. Cadogan, Senior Vice President, Site Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation.

- Title 10 CFR 50.55a(g)(4), "Inservice Inspection Standards Requirement for Operating Plants," states, in part, "Throughout the service life of a pressurized water-cooled nuclear power facility, components that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements set forth in Section XI of the ASME Code." The ASME Code, Section XI, Article IWA-2610, requires that a reference system be established for all welds and areas subject to a surface or volumetric examination. This includes identifying each weld that is subject to ASME Section XI requirements. Contrary to the above, prior to April 12, 2017, the licensee failed to establish a reference system for all welds and areas subject to a surface or volumetric examination. Specifically, five welds located in an ASME Code, Section XI, Class 2, train A and train B refuel water suction lines were not identified as applicable ASME Section XI welds. The licensee restored compliance by correctly reclassifying the subject welds and entering them in the ASME Section XI program. The finding was of very low safety significance (Green) because the finding did not represent an actual loss of safety function of a system or train and did not result in the loss of a single train for greater than technical

specification allowed outage time. This issue was entered into the licensee's corrective action program as Condition Report 17-05607.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Cadogan, Senior Vice President, Site Operations
M. Lacal, Senior Vice President, Regulatory and Oversite
B. Rash, Vice President, Engineering
G. Andrews, Director, Nuclear Regulatory Affairs
A. Bassett, Steam Generator Engineer, System Engineering
M. Brannen, ISI Program Owner, ISI Engineering
R. Chu, Senior Engineer, Regulatory Affairs
J. Cox, ISI Program Owner, ISI Engineering
D. Elkinton, Section Leader, Nuclear Regulatory Affairs
T. Gaffney, Department Leader, Program Engineering
K. Graham, Director, Plant Engineering
D. Hansen, Senior Consulting Engineer, Engineering
R. Harley, Engineer, Program Engineering
M. Kura, Section Manager, Nuclear Regulatory Affairs
D. Leech, Section Leader, Program engineering
M. Meyer, Auditor, Program Engineering
M. McGhee, Department Leader, Nuclear Regulatory Affairs
H. Nelson, Director, Nuclear Promise
K. Schrecker, Section Leader, Program Engineering
D. Van Allen, Senior Engineer, Program Engineering/ISI

NRC Personnel

R. Deese, Senior Reactor Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000528/2017002-01	NCV	Inoperable Containment Isolation Valve Due to Not Operating Valve in Accordance with Station Procedures (Section 4OA3)

Closed

05000530/2016-001-00 05000530/2016-001-01	LER	Control Room Essential Filtration System Air Filtration Unit Failure Resulting in a Condition Prohibited by Technical Specifications (Section 4OA3)
05000528/2016-003-00	LER	Inoperable Containment Isolation Valve SGA-UV-1134 Due to Failure to Close During Testing (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
51DP-0OM03	Site Scheduling	35
40OP-9ZZ19	Hot Weather Protection	6
40AP-9ZZ21	Acts of Nature	37

Condition Reports (CRs)

16-12020

Section 1R04: Equipment Alignment

Procedures

Number	Title	Revision
40OP-9EW01	Essential Cooling Water System (EW) Train A	29
40OP-9SI01	Shutdown Cooling Initiation	56
40EP-9EO03	Loss of Coolant Accident	42

Miscellaneous

Number	Title	Revision
01-M-SIP-001	P&I Diagram: Safety Injection & Shutdown Cooling System	55
01-M-SPP-0001	P&I Diagram: Essential Spray Pond System	62
01-M-PCP-0001	P&I Diagram: Fuel Pool Cooling & Cleanup System	31

Section 1R05: Fire Protection

Procedures

Number	Title	Revision
14DP-0FP09-10	Firefighter Annual Physical Ability Evaluation	0
14DP-0TR05	Fire Department Operations Drill Process	1

Miscellaneous

Number	Title	Revision/Date
	Pre-Fire Strategies Manual	25
	Updated Final Analysis Report	18C
	Fire Drill Schedule	January 5, 2017

Miscellaneous

Number	Title	Revision/Date
	U3 Active FSCCR Listing	May 22, 2017
13-MM-0650	Fire Protection Sprinkler & Spray System Sub	October 26, 1995
13-MS-A083	NFPA Code Applicability and Conformance Review	July 22, 1999

Section 1R08: Inservice Inspection Activities

Procedures

Number	Title	Revision
73TI-0ZZ13	Radiographic Examination	19
73TI-9RC09	Bare Metal Visual Examination of Reactor Vessel Upper Head	4
73TI-9ZZ22	Visual Examination For Leakage - Interval 3	10
73DP-9WP04	Welding and Brazing Control	18
73WP-0ZZ02	Internal Gas Purging	6
73WP-0ZZ07	Welding of Stainless and Nickel Alloys	18
73WP-0ZZ05	Welding of Ferritic and Martensitic Steels	14
73WP-0ZZ04	Welding of Carbon and Low Alloy Steels to Stainless and Nickel Alloys	19
73TI-9ZZ09	Ultrasonic Examination of Pipe and Vessel Welds	17
73TI-9ZZ07	Liquid Penetrant Examination	17
73TI-9ZZ05	Dry Magnetic Particle Examination	18
73DP-9ZC01	Boric Acid Corrosion Control Program	7
70TI-9ZC01	Boric Acid Walkdown Leak Detection	19
73TI-9RC01	Steam Generator Eddy Current Examinations	32
81DP-9RC01	PVNGS Steam Generator Management Program	17
73DP-9XI03	ASME Section XI Inservice Inspection	19

Miscellaneous Documents

Number	Title	Revision/Date
4301930	2013 Welding Program Self-Assessment	March 3, 2013
4362861	Formal Self-Assessment of the Inservice Inspection Program	August 16, 2013

Miscellaneous Documents

Number	Title	Revision/Date
U2R20 SG DA	"Replacement" Steam Generators Analysts Guidelines Training Manual	20
SG-SGMP-17-5	Palo Verde U2R20 Steam Generator Degradation Assessment	0
SGP-REP-INS-FP-GEN	Standard In-Situ Pressure Test Using the Computerized Data Acquisition System	3
02-MS-A139	U2R18 SG Condition Monitoring Evaluation	0
1000975	EPRI Boric Acid Corrosion Guidebook	1

Condition Reports (CRs)

17-05797	17-05740	17-05607	17-05584	17-05581
17-05522	17-05513	17-05384	17-05368	17-05120
17-04781	17-04235	17-02870	16-18605	16-17246
16-08853	16-05402	15-12565	17-04843	16-16820
16-16502	17-04781	16-17017	16-16877	16-16768
16-16739	16-16195	16-16086		

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

Procedures

Number	Title	Revision
40DP-9OP02	Conduct of Shift Operations	69
40OP-9ZZ05	Power Operations	147
EP-0901	Classifications	9

Condition Reports (CRs)

17-04808

Miscellaneous

Number	Title	Revision
	Specific Maneuver Plan: EOC Shutdown 96.7% to 20%	0
SES-0-09-AN-06	Slipped CEA/ Loss of PNB/FRP	0

Section 1R12: Maintenance Effectiveness

Procedures

Number	Title	Revision
70DP-0MR01	Maintenance Rule	43

Condition Reports (CRs)

16-09113	17-05413	17-06471	16-04251

Miscellaneous

Number	Title	Date
4783759	Engineering Evaluation	June 2, 2016
CBDR-0011	High Pressure Safety Injection Pump 1MSIAP02	
	PVNGS: System Health Reports (Nov 1, 2016 to Jan 31, 2017)	
	Palo Verde Maintenance Rule Database	
	Unit 2 Maintenance Rule SSC Unavailability Report	June 9, 2017

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
70DP-0RA01	Shutdown Risk Assessment	54
93DP-0LC07-01	10 CFR 50.59 and 72.48 Administrative Guideline	3
02DP-9RS01	Operational Risk Management	1
40DP-9AP21	Protected Equipment	7

Condition Reports (CRs)

17-06085	16-15545	17-06842

Miscellaneous

Number	Title	Date
	Shutdown Safety Function Assessment	April 11, 2017
	Shutdown Safety Function Assessment	May 2, 2017
16-15545-033	Engineering Evaluation	May 5, 2017
	Scheduler’s Evaluation for PV Unit 3	June 1, 2017

Miscellaneous

Number	Title	Date
4899849	Active Component Condition Record	June 1, 2017
4899151	Active Component Condition Record	June 1, 2017
4899591	Troubleshooting Game Plan	June 1, 2017
4898912	Troubleshooting Game Plan	June 1, 2017
4755204	Unit 2, B High Pressure Safety Injection Pump Motor	June 15, 2017

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision/Date
	ASME OM Code-2001	November 2, 2001
40MT-9ZZ01	Operations Maintenance Activities	5
74DP-9CY04	Systems Chemistry Specifications	92
73ST-9XI33	HPSI Pump and Check Valve Full Flow Test	61
73ST-9SI10	HPSI Pumps Mini-Flow – Inservice Test	51
37MT-9ZZ01	Vibration Survey	15

Condition Reports (CRs)

17-06022	17-06373	17-07600	17-07589	17-07579
17-07432	17-07457	17-07937	17-06480	16-04251
17-06531				

Work Orders (WOs)

4755693	4590041	4755588	4886937

Miscellaneous

Number	Title	Date
17-06373-002	Engineering Evaluation	April 28, 2017
17-07937	Engineering Evaluation	May 27, 2017
M018-119	Control Diagram Shutdown System	April 14, 1977
Plant Review Board Presentation	U3 RCP 1B Seal Leakage	May 11, 2017

Miscellaneous

Number	Title	Date
	U3 RCP 1B Boric Acid Leakage Inspection Plan Phase 1	May 10, 2017
Operations Decision Making Instrument	Evaluation/Action Plan: Leakage on (Unit 3) Reactor Coolant Pump (1A) Seal Housing	May 13, 2017

Section 1R18: Plant Modifications

Procedures

Number	Title	Revision/Date
	ASME OM Code-2001	November 2, 2001
40MT-9ZZ01	Operations Maintenance Activities	5A
74DP-9CY04	Systems Chemistry Specifications	92
70DP-0RA01	Shutdown Risk Assessments	54
14DP-0BD01-17	Fuel Delivery Leader Guideline	0
14DP-0FP33	Control of Transient Combustibles	28

Condition Reports (CRs)

17-07600	17-07589	17-07579	17-04720	17-04728

Work Orders (WOs)

4747903	4643565

Miscellaneous

Title	Revision
Decision Making Basis Summary	0

Section 1R19: Post-Maintenance Testing

Procedures

Number	Title	Revision
40OP-9CH12	Refueling Water Tank (RWT) Operations	40
73ST-9SI10	HPSI Pumps Miniflow – Inservice Test	51
32MT-9ZZ52	Battery Charger Preventive Maintenance	32
36MT-9RC01	Pressurizer Pressure Control System Calibration	21

Procedures

Number	Title	Revision
73ST-9SI06	Containment Spray Pumps and Check Valves – Inservice Test	42
73ST-9SI15	Containment Spray Pumps Comprehensive Pump Test	34
40ST-9GT07	Station Blackout Generator 2 Timed Test	5
40DP-9GT02	Station Blackout Generator Testing Program	2
40ST-9GT05	Station Blackout Generator 2 Quarterly Test	5

Condition Reports (CRs)

17-06480	17-05248	17-05541	17-06536	17-06196
17-06200	17-05488	17-09081	17-09729	

Work Orders (WOs)

4754126	4649047	4603587	4696107	4705484
4629472	4643458	4609282	4584037	4653610
4608043	4684835	4594817	4592362	4543188
4565096	4690303	4569340	4730886	3118138

Miscellaneous

Title

2B HPSI Pump – Vibration Data Summary (ips)

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
73ST-9CL01	Containment Leakage Type B and C Testing	44
73ST-9SI11	Low Pressure Safety Injection Pumps Miniflow – Inservice Test	35
73ST-9DG01	Class 1E Diesel Generator and Integrated Safeguards Test Train A	28
36ST-9SA03	ESPAS Train A Subgroup Relay Shutdown Functional Test	31
73ST-9XI33	HPSI Pump and Check Valve Full Flow Test	61
73ST-9SI10	HPSI Pumps Mini-Flow – Inservice Test	51

Procedures

Number	Title	Revision
37MT-9ZZ01	Vibration Survey	15

Condition Reports (CRs)

17-05945	17-08909	17-06480	16-04251	

Work Orders (WOs)

4730764	4886937	4590041	4755588	4755693

Miscellaneous

Number	Title	Date
White Paper	2MSIBP02 HPSI Pump B Vibe Trends	March 14, 2016

Section 1EP6: Drill Evaluation

Procedures

Number	Title	Revision
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	7
EP-0902	Notifications	8
EP-0904	ERO/ERF Activation and Operation	5

Condition Reports (CRs)

17-09473	17-09490	17-09491	17-09519

Miscellaneous

Number	Title
Form 361	NRC Reactor Plant Event Notification Worksheet
	Timeline for 1704 – ERO Mini Drill
	PVNGS Scenario Synopsis (Major Drill Events)

Section 4OA1: Performance Indicator Verification

Miscellaneous

Number	Title	Revision/Date
13-NS-C075	Palo Verde MSPI Basis Document	9

Miscellaneous

Number	Title	Revision/Date
	1Q/2017 Performance Indicators – Palo Verde 1	May 19, 2017
	1Q/2017 Performance Indicators – Palo Verde 2	May 19, 2017
	1Q/2017 Performance Indicators – Palo Verde 3	May 19, 2017
	MSPI Indicator Margin Reports	April 2017
	Consolidated Data Entry 4.0: MSPI Derivation Reports	March 2017

Section 4OA2: Problem Identification and Resolution

Procedures

Number	Title	Revision
70DP-0MR01	Maintenance Rule	43
73TD-0ZZ03	System Engineering Handbook	24

Condition Reports (CRs)

15-07271	16-00589	16-01261	17-00543	17-01550
17-01713	17-08542	16-09075		

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

Procedures

Number	Title	Revision
70DP-0EE10	Control of Welding, Painting, and the Use of Solvents	5
81DP-0EE10	Design Change Process	42

Condition Reports (CRs)

16-11650-005	16-16060

Engineering Evaluations

4688748

PAPERWORK REDUCTION ACT STATEMENT

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Information Request
March 7, 2017
Notification of Inspection and Request for Information
Palo Verde Nuclear Generating Station Unit 2
NRC Inspection Report 05000529/2017002

INSERVICE INSPECTION DOCUMENT REQUEST

Inspection Dates: April 10 - 26, 2017

Inspection Procedures: IP 71111.08 "Inservice Inspection (ISI) Activities"

Inspector: Wayne Sifre, Senior Reactor Inspector

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 Wayne Sifre, by March 27, 2017, to facilitate the selection of specific items that will be reviewed during the onsite inspection weeks. The inspector 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 10, 2017, 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 2, using NRC Inspection Procedure 71111.08, "Inservice Inspection Activities." Experience has shown that this inspection is a resource intensive inspection both for the NRC inspectors 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 Mr. David Heckman of your licensing organization. The tentative inspection schedule is as follows:

Preparation week: April 3, 2017
Onsite weeks: April 10 - 26, 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 Wayne Sifre at (817) 200-1193. (mailto:Wayne.Sifre@NRC.GOV).

A.1 ISI/Welding Programs and Schedule Information

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

   - 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.

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

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

   - 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.

   - 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 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 noncode 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.).

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

A.4 Additional Information Related to all Inservice Inspection Activities

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. Provide copies of the applicable editions of the ASME Code (Sections V, VIII, IX, and XI) for the inservice inspection program and the repair/replacement program.

4. 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 at the Entrance Meeting (April 10, 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 inspectors 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 inspectors 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 inspectors 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 (If Being Inspected, otherwise N/A)

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.

    - 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.).

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