



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

**REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511**

January 29, 2019

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 05000528/2018004, 05000529/2018004, AND
05000530/2018004**

Dear Mr. Bement:

On December 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station Units 1, 2, and 3. On January 2, 2019, the NRC inspectors discussed the results of this inspection with Mr. Bruce Rash and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy. Further, inspectors documented a licensee-identified violation which was determined to be Severity Level IV in this report. The NRC is treating this violation as an NCV consistent with Section 2.3.2 of the Enforcement Policy.

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

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the 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 F. O'Keefe, 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 05000528/2018004,
05000529/2018004, 05000530/2018004
w/Attachments:

1. Documents Reviewed
2. Request for Information

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000528, 05000529, 05000530

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

Report Numbers: 05000528/2018004, 05000529/2018004, and 05000530/2018004

Enterprise Identifier: I-2018-004-0013

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station

Location: 5801 South Wintersburg Road, Tonopah, AZ 85354

Inspection Dates: October 1, 2018 to December 31, 2018

Inspectors: C. Peabody, Senior Resident Inspector
D. Reinert, PhD, Resident Inspector
D. You, Resident Inspector
W. Sifre, Senior Reactor Inspector
J. Drake, Senior Reactor Inspector
C. Osterholtz, Senior Operations Engineer
C. Smith, Reactor Inspector
C. Stott, Reactor Inspector
S. Hedger, Emergency Preparedness Inspector
N. Hernandez, Operations Engineer

Approved By: N. O'Keefe, Chief
Project Branch D,
Division of Reactor Projects

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting baseline inspections 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. NRC-identified and self-revealed findings, violations, and additional items are summarized in the table below. Licensee-identified non-cited violations are documented in the Inspection Results at the end of this report.

List of Findings and Violations

Failure to Properly Preplan Corrective Maintenance			
Cornerstone	Significance	Cross-cutting Aspect	Inspection Procedure
Initiating Event	Green NCV 05000529/2018004-001 Closed	[H.5] – Human Performance, Work Management	71111.13 — Maintenance Risk and Emergent Work Control
<p>The inspectors reviewed a Green, self-revealing, non-cited violation of Technical Specification 5.4.1.a for the licensee’s failure to properly preplan maintenance that can affect the performance of safety-related equipment. Specifically, while planning replacement of an automatic control element drive mechanism timer module (ACTM) card, the licensee failed to provide instructions that would prevent unseating the adjacent ACTM card and losing electrical continuity or else plan the work for a plant mode that would not result in a plant transient. This caused a control element assembly to drop to the bottom of the core resulting in an automatic reactor trip.</p>			

Failure to Establish an Adequate Procedure for Control of Potential Tornado Borne Missiles			
Cornerstone	Significance	Cross-cutting Aspect	Inspection Procedure
Mitigating Systems	Green NCV 05000529/2018004-002 Closed	[H.3] – Human Performance, Change Management	71111.20 — Refueling and Other Outage Activities
<p>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 prescribe instructions appropriate to the circumstances for the control and monitoring of transient missile hazards that have the potential to affect the operability of the essential spray ponds.</p>			

PLANT STATUS

Units 1 and 3 operated at or near full power for the entire inspection period.

Unit 2 operated at full power with the exception of a planned refueling outage which lasted from October 6, 2018 – December 3, 2018.

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." [Include for integrated report: 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

71111.04—Equipment Alignment

Partial Walkdown (3 Samples)

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

- (1) Unit 2 shutdown cooling system A, on October 12, 2018
- (2) Unit 3 high pressure injection system A, on November 14, 2018
- (3) Unit 1 Class 1E 480V motor control centers system A, on December 20, 2018

71111.05AQ—Fire Protection Annual/Quarterly

Quarterly Inspection (5 Samples)

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

- (1) Unit 3 electrical penetration rooms, Fire Zones 42 A and 42B, on October 1, 2018
- (2) Unit 2 main steam support structure 140' elevation, Fire Zones 74A and 74B, on October 3, 2018
- (3) Unit 2 containment near steam generator #2 economizer line, Fire Zone 63A, on October 17, 2018
- (4) Unit 3 fuel building, Fire Zones 27, 28, and 29, on October 18, 2018
- (5) Unit 1 main control room, Fire Zone 17 on November 16, 2018

71111.07—Heat Sink Performance

Heat Sink (Triennial) (4 Samples)

The inspectors evaluated exchanger/sink performance on the following components November 6, 2018, to November 9, 2018:

- (1) Unit 2 Essential Cooling Water Heat Exchanger B, Section 02.02b
- (2) Unit 1 Essential Chiller A, Section 02.02c
- (3) Unit 1 Fuel Pool Cooling Heat Exchanger B, Section 02.02c
- (4) Unit 3 Auxiliary Feedwater Pump Turbine Oil Cooler, Section 02.02c

71111.08—Inservice Inspection Activities (Unit 2) (1 Sample)

The inspectors evaluated non-destructive examination activities by observing the following activities:

- (1) Ultrasonic Examinations
 - a) Data Sheet 2-053-013 on steam to auxiliary feedwater system
 - b) Data Sheet 2-054-006A on Steam Generator 1 feedwater system
 - c) Data Sheet 2-054-010A on Steam Generator 1 feedwater system
- (2) Dye Penetrant Examinations
 - a) Data Sheet 2-054-005-NW-1-18-PT-2003 on Steam Generator 1 feedwater system
 - b) Data Sheet 2-054-006A-18-PT-2004 on Steam Generator 1 feedwater system
- (3) Phased Array Ultrasonic Examinations
Data Sheet 2-027-009-011 on Pressurizer Spray 1A
- (4) Radiography Examination
Data Sheet 18-946 on Steam Generator 1 feedwater system

The inspector evaluated non-destructive examination activities by reviewing the following activities:

- (1) Ultrasonic Examinations
 - a) Data Sheet 2-058-001-NW-1 on Steam Generator 1 auxiliary feedwater system
 - b) Data Sheet 2-058-004-NW-1 on Steam Generator 1 auxiliary feedwater system
 - c) Data Sheet 2-058-019 on Steam Generator 1 auxiliary feedwater system
- (2) Dye Penetrant Examinations
 - a) Data Sheet 2-058-001-NW-1-18-PT-2007 on Steam Generator 1 auxiliary feedwater system
 - b) Data Sheet 2-058-004-NW-1-18-PT-2006 on Steam Generator 1 auxiliary feedwater system
 - c) Data Sheet 2-058-019-18-PT-2001 on Steam Generator 1 auxiliary feedwater system

- (3) Magnetic Particle Examinations
 - a) Data Sheet 2-053-013-18-MT-2012 on steam to auxiliary feedwater system
 - b) Data Sheet 2-054-010A-18-MT-2011 on Steam Generator 2 feedwater system

- (4) Phased Array Ultrasonic Examinations
 - a) Data Sheet 2-032-008-018 on Reactor Coolant Loop 1A drain
 - a) Data Sheet 2-033-010-018 on Reactor Coolant Loop 1B drain
 - b) Data Sheet 2-028-011-011 on Pressurizer Spray 1B
 - c) Data Sheet 2-037-013-011 on Charging 2A
 - d) Data Sheet 2-034-012-018 on Reactor Coolant Loop 2A drain
 - e) Data Sheet 2-036-014-018 on Letdown 2B

The inspector evaluated welding activities by reviewing the following records:

Gas Tungsten Arc Welding (GTAW)

- a) Weld Data Sheet 5024637 on Steam Generator 1 feedwater system
- b) Weld Data Sheet 5024646 on Steam Generator 2 feedwater system

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

The licensee did not perform a bare metal head inspection on the Unit 2 reactor vessel upper head penetrations.

The licensee did not perform steam generator tube eddy current examinations on the Unit 2 steam generators.

The Inspector evaluated a sample of condition reports associated with inservice inspection activities.

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated licensed operator continuing training simulator scenario on November 28, 2018. The inspectors assessed the performance of the operators and control room simulator.

Operator Performance (1 Sample)

The inspectors observed and evaluated operators performing a planned reactor coolant system cooldown for a refueling outage on October 6, 2018, and synchronizing the main generator to the grid following a stator rewind on December 3, 2018.

Operator Exams (1 Sample)

The inspectors reviewed and evaluated requalification examination results on December 27, 2018.

Operator Requalification Program (1 Sample)

The inspectors evaluated the operator requalification program from September 24, 2018, to December 27, 2018.

71111.12—Maintenance Effectiveness

Quality Control (1 Sample)

The inspectors evaluated maintenance and quality control activities associated with the following equipment performance issues:

- (1) Unit 2 polar crane replacement parts acceptance review, on October 30, 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 1 emergent risk assessment due to the failure of safety injection system valve 660, on October 4, 2018
- (2) Units 1, 2, and 3, emergent risk due to unplanned loss of the west switchyard bus, on October 4, 2018
- (3) Unit 2 outage risk assessment during reactor coolant system lowered inventory, on October 12, 2018
- (4) Unit 2 reactor trip due to dropped control element assembly, on May 23, 2018

71111.15—Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 2 high pressure safety injection pump B operability during refueling water tank recirculation, on October 16, 2018
- (2) Unit 2 reactor coolant system operability following the identification of reactor head O-ring groove indication, on November 15, 2018
- (3) Unit 2 control room envelope allowable open area during maintenance/modification on the control room envelope boundary, on November 16, 2018
- (4) Unit 2 evaluation of visual indications on fuel assemblies, on November 16, 2018

71111.18—Plant Modifications (1 Sample)

The inspectors evaluated the permanent modification DMWO 3282819 Polar Crane Upgrade on November 5, 2018

71111.19—Post Maintenance Testing (4 Samples)

The inspectors evaluated the following post-maintenance tests:

- (1) 73ST-9ZZ25, Unit 2 boration flow path check valve testing following disassembly and inspection, on October 29, 2018
- (2) 73ST-9XI33, Unit 2 high pressure safety injection pump B full flow test and vibration readings, on October 30, 2018
- (3) 40ST-9DG01, Unit 3 diesel generator A surveillance test following spray pond pump A failure to start and spray pond pump breaker replacement, on November 2, 2018
- (4) 36ST-9SB04, Unit 3 plant protection system test of the main steam isolation signal channel B following an erroneous half-leg trip, on December 11, 2018

71111.20—Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated refueling outage 2R21 activities from October 6, 2018, to December 3, 2018.

71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (1 Sample)

- (1) 73ST-9SI06, Unit 1 B train containment spray pump, on December 20, 2018

In-service (1 Sample)

- (1) Unit 2 low pressure safety injection system A check valve 134 inservice test, on October 9, 2018

Containment Isolation Valve (1 Sample)

- (1) Unit 2 local leak rate testing of electrical and mechanical penetrations, on October 23, 2018

71114.04—Emergency Action Level and Emergency Plan Changes (2 Samples)

The inspector evaluated Palo Verde Nuclear Generating Station Emergency Plan, Revision 62, submitted on September 25, 2018; and Revision 63, submitted on December 6, 2018. Associated 10 CFR 50.54(q) emergency plan change process documentation was reviewed as well. The evaluation was performed in-office from December 3, 2018, to December 14, 2018. This evaluation does not constitute NRC approval.

OTHER ACTIVITIES – BASELINE

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.

Annual Follow-up of Selected Issues (2 Samples)

The inspectors reviewed the licensee’s implementation of its corrective action program related to the following issues:

- (1) Unit 2 containment liner punch marks
- (2) Units 1 and 2 excore nuclear instruments missing O-rings at preamplifier-filter connections

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

Licensee Event Reports (4 Samples)

The inspectors evaluated the following licensee event reports which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) Licensee Event Report 05000528/2018-001-00, automatic actuation of the reactor protection system resulting from a loss of reactor coolant pumps, on February 15, 2018
- (2) Licensee Event Report 05000528/2018-003-00, condition prohibited by technical specification 3.7.4 due to inoperable atmospheric dump valve, on May 14, 2018
- (3) Licensee Event Report 05000528/2018-004-00 and 05000528/2018-004-01, engineered safety feature pump room exhaust air cleanup system failure resulting in a condition prohibited by technical specifications, on May 17, 2018
- (4) Licensee Event Report 05000529/2018-001-00, Unit 2 reactor trip due to dropped control element assembly, on May 23, 2018

INSPECTION RESULTS

Observation	71152 — Problem Identification and Resolution
The inspectors reviewed the licensee’s response to a negative trend noted on their reactor vessel O-ring, specifically, the inner O-ring. The reactor vessel closure head interfaces with the reactor vessel by a raised face flanged design containing two metallic O-ring seals. Between the inner and outer O-rings on the reactor vessel mating surface is a port that is piped to the reactor drain tank. This small pipe is also connected to a pressure instrument which is used to determine if a leak past the inner O-ring exists.	

On November 5, 2017, Unit 1 had indication of rising pressure in the area between the inner and outer reactor vessel O-rings (CR 17-16139). On May 4, 2018, Unit 3 had a similar indication of rising pressure (CR 18-07701). Both of these cases indicate that there is leakage past the inner O-ring. However, there has yet to be indication of any leakage past the outer O-ring. It should be noted that in both cases, the leakage was observed shortly after coming out of a planned refueling outage.

Noting these two adverse trends, the licensee elected to perform an evaluation on the handling and installation of the metallic O-rings during the Unit 2 refueling outage which took place from October 6, 2018, to December 3, 2018. The licensee had the O-ring vendor Technetics onsite to perform the evaluation. Although the vendor did not observe any gross errors with the handling and installation, they did recommend the following actions:

- Placing the O-ring in a transportation crate from the warehouse to the head stand
- Use of tygon tubing for protecting the seals
- Maintain protective covering on the new O-ring seals until the old O-ring has been removed and the new O-ring is ready to install
- Consider repairing any defects greater than 0.0001” on the sealing surface
- A significant factor in sealing performance is percent of compression of the seal. Currently, Palo Verde is seeing about 9 percent compression. The vendor is recommending 16 percent compression. This would entail using a thicker O-rings (from 0.5” cross section O-ring to 0.525”)

The licensee’s engineering group is using the vendor report as an input to a final engineering evaluation of all the actions they plan on implementing to enhance their handling and installation of the reactor vessel O-rings. The licensee is aiming for these recommendations to be put into action prior to their next refueling outage (Unit 1, April 2019). These enhancement actions will be documented under CR 18-07701.

Observation	71111.18 — Plant Modifications
<p>The inspector discussed with licensee staff discrepancies noted in the vendor quality assurance paperwork that the licensee accepted deviations of the as-delivered components from NUREG-0554, ASME NOG-1, and Palo Verde Nuclear Generating Station design specification 13-CN-0390, “Technical Requirements for Upgrading the Containment Building Polar Crane to Single Failure Proof,” that was provided to Konecranes. The inspector noted the following exceptions listed below:</p>	
<p>Licensee Design Document: 13-CN-0390, “Technical Requirements for Upgrading the Containment Building Polar Crane to Single Failure Proof”</p>	
Requirement	Observation
Section 7.5.1, stated in part, “The girders, end trucks, and trolleys shall be of basically welded construction. All bolted connections shall be in accordance with American	Not all weldments and castings that could collect moisture have drainage holes.

Institute of Steel Construction specifications for structural joints using American Society for Testing and Materials specifications A325 or A490 bolts. All castings and weldments that may collect moisture shall have drain holes 1/2-inch minimum. . .”	
Section 7.5.2.1, stated in part, “All welding and welding criteria shall be in accordance with the following codes and standards: All structural steel welding shall be performed in accordance with American Welding Society (AWS) specification D1.1. . .”	Some of the vendors used AWS Specification D14.1, “Specification for Welding of Industrial and Mill Cranes and other Material Handling Equipment” versus AWS specification D1.1, “Structural Welding Code – Steel.”
Section 7.9.1, required the crane to be able to operate at a minimum temperature of 60°F.	Konecranes NUREG 0612, Appendix C, “Compliance Matrix,” stated in part, “Impact testing was not performed on the bridge when initially built, so Palo Verde Nuclear Generating Station has elected to perform critical lifts only when Containment Building temperatures are >70°F.”
Section 7.11.3.4, stated in part, “All threaded fasteners which have the potential to fall into the fuel or equipment pools shall be installed utilizing thread locking fluid, lock wire, or staking to prevent loosening during crane operation. Lock washers shall not be utilized. . .”	A number of fasteners used lock washers while the majority of the fasteners inspected had no lock washer, lock wire, staking, or apparent Locking fluid.
Section 7.11.4.1, did not permit aluminum components to be used inside containment, unless contained within a sealed terminal box or waterproof housing.	The terminal blocks in the new cabinets appear to be aluminum. Several of these cabinets are open to the containment atmosphere via cooling vents or conduits.
Vendor Document: CN390-A00359, “Polar Crane Unit 2 Factory Acceptance Test”	
Requirement	Observation
Step 7.46 a. auxiliary hoist micro speed test specification of 3 ft/min (+/- 10 percent)	Recorded values of 2.6 ft/min raise and 2.4 ft/min lower, outside the required range of 2.7 to 3.3 ft/min
Step 7.46 b. hoist micro speed specification of 1.5 ft/min (+/- 10 percent)	Recorded values of 34.4 ft/min raise and 34.2 ft/min lower, outside the required range of 1.35 to 1.65 ft/min
Step 7.46 c. auxiliary hoist electrical current specification limit not to exceed 66 amps	No value recorded
Step 8.48 calculated main hoist speed specification of 4.0 ft/min (+/- 10 percent)	Recorded main hoist drum speed not converted to main hoist speed
Step 8.50 calculated main hoist micro speed specification of 3 in/min (+/-10 percent)	Recorded values of 23.6 raise and 22.9 lower with no units
Step 8.50 b. main hoist electrical current specification limit not to exceed 84 amps	No value recorded

NUREG 0554, “Single-Failure-Proof Cranes For Nuclear Power Plants”	
Requirement	Observation
Section 2.3, “Operating Environment,” stated in part, “The operating environment, including maximum and minimum pressure, maximum rate of pressure increase, temperature, humidity, and emergency corrosive or hazardous conditions, should be specified for the crane and lifting fixtures. . .”	Vendor Document 13-CN-0390, “Technical Requirements for Upgrading the Containment Building Polar Crane to Single Failure Proof,” does not provide values for minimum pressure, maximum rate of pressure increase, and emergency corrosive or hazardous conditions. The licensee was unable to provide these values to the inspector.
Section 2.3, “Operating Environment,” stated in part, “For cranes inside the containment structure, the closed box sections of the crane structure should be vented to avoid collapse during containment pressurization. Drainage should be provided to avoid standing water in the crane structure.”	There were a number of closed box sections of crane supports without the recommended vent and/or drain valves.
Section 2.8, “Welding Procedures,” stated in part, “. . . Welds described in the recommendations of Section 2.6 should be post-weld heat treated in accordance with Subarticle 3.9 of AWS D1.1 . . .”	Some of the vendors used American Welding Society (AWS) specification D14.1, “Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment,” versus AWS specification D1.1.
ASME NOG-1, 2004, “Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)”	
Section 5427.1, specifically requires steel sheaves.	Konecranes August 23, 2017, letter stated, in part, “. . . Since NOG-1-2004, Section 5427.1, specifically requires steel sheaves, we have taken an exception to NOG-1. Sections 5.3.5 of references 3 and 4 provide the technical justification on why the sheaves are acceptable.”
Other Observations	
The proposed update to the updated final safety analysis report (UFSAR) stated, “The containment polar cranes have been upgraded to meet the guidelines for single-failure-proof cranes contained in NUREG 0554.”	The proposed update was not accurate for all of the “as received” polar crane components, as described in the above table for NUREG 0554.
Guidelines state that the crane meets ASME NOG-1 requirements.	Konecranes August 23, 2017, letter, states: “Since NOG-1-2004, Section 5427.1, specifically requires steel sheaves, we have taken an exception to NOG-1. Sections 5.3.5 of references 3 and 4 provide the technical justification on why the sheaves are acceptable.”
The inspector identified additional discrepancies and verified that the licensee documented all discrepancies in Condition Report CR-18-17888.	

Licensee-Identified Non-Cited Violation	71111.11 — Licensed Operator Requalification Program
<p>This violation of very low safety-significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.</p> <p>Violation: Title 10 CFR Part 50.74 requires licensees to notify the NRC within 30 days of a change in medical condition of a licensed operator.</p> <p>Contrary to the above, from May 18, 2018, to October 30, 2018, the licensee failed to notify the NRC of a change in medical condition of a licensed operator.</p> <p>Significance/Severity Level: Severity Level IV. The performance deficiency was evaluated in accordance with the reactor oversight process and was determined to be minor because a licensing decision was not made due to the absence of this medical information, the individual was not on shift during the period of May 18, 2018, to December 12, 2018, and has used this therapeutic device and taken the medications as prescribed. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to deter noncompliance. The inspectors determined the violation to be a Severity Level IV violation similar to Example 6.4.d.1(b) in the NRC Enforcement Policy and because it impacted the ability of the NRC to perform its regulatory oversight function. Specifically, by failing to inform the NRC of a change in an operator's medical condition, the licensee prevented the NRC from performing the regulatory reviews associated with that process.</p> <p>Corrective Action Reference: Condition Report 18-17047</p>	

Failure to Properly Preplan Corrective Maintenance			
Cornerstone	Significance	Cross-cutting Aspect	Inspection Procedure
Initiating Event	Green NCV 05000529/2018004-001 Closed	[H.5] – Human Performance, Work Management	71111.13 — Maintenance Risk and Emergent Work Control
<p>The inspectors reviewed a Green, self-revealing, non-cited violation of Technical Specification 5.4.1.a for the licensee's failure to properly preplan maintenance that can affect the performance of safety-related equipment. Specifically, while planning replacement of an automatic control element drive mechanism (CEDM) timer module (ACTM) card, the licensee failed to provide instructions that would prevent unseating the adjacent ACTM card and losing electrical continuity or else plan the work for a plant mode that would not result in a plant transient. This caused a control element assembly to drop to the bottom of the core resulting in an automatic reactor trip.</p>			

Description: On May 23, 2018, I&C technicians were performing planned maintenance on Unit 2. The activity was intended to replace control element drive mechanism control system (CEDMCS) logic power fuses and fuse holder caps in subgroups 15 and 16 with components of a newer design. With Unit 2 at 100 percent power, the licensee began the activity by placing subgroup 15 control element assemblies (CEAs) on the hold bus to allow the technicians to begin the fuse replacements without causing a loss of power to the subgroup 15 CEAs. As part of the maintenance activity, the technicians were to remove subgroup 15 ACTM cards one at a time. Once each set of fuses were replaced, the associated ACTM card would then be reseated. Three of the ACTM cards for subgroup 15 were reinstalled with no issues. However when attempting to reseat the ACTM card for CEA 62, the technicians encountered alignment issues. During their attempts to reseat the card, Unit 2 reactor tripped due to low departure from nucleate boiling ratio (DNBR) trip signals. There were no issues with the standard post trip actions.

The licensee's post trip investigation determined that the automatic trip was the result of CEA 64 dropping to the bottom of the core causing the core protection calculators to generate a low DNBR and a high local power density trip signal. The technicians also determined that the ACTM card for CEA 64, located next to the CEA 62 card the technicians were trying to reseat and powered from a different subgroup, had become unseated and lost power. The licensee entered the event into their corrective action program as CR 18-08748 and performed a root cause evaluation.

The root cause evaluation revealed the following items:

- The alignment issue when trying to reseat an ACTM card caused the lower logic card, located behind and at right angles to the ACTM cards, to flex away from the row of ACTM cards causing adjacent ACTM cards to slowly unseat.
- The card alignment issue was a known equipment deficiency in Unit 2. Specifically, CR 17-09075, written on June 20, 2017, identified the issue that when manipulating a card, an adjacent card could be unseated.
- The card alignment issue was discussed in work planning meetings for this activity, but action to prevent the possibility affecting adjacent cards (especially in another subgroup) was not considered.

As a result the licensee did not establish any additional controls to mitigate the possibility that the known card alignment deficiency could cause unseating of adjacent cards. Alternatively, the inspectors noted that the licensee could have considered performing the fuse replacement activity during a plant mode when the card alignment deficiency would not have caused a plant transient, such as during a refueling outage.

Corrective Action: Unit 2 corrected the alignment issues during refueling outage 2R21. An extent of condition found that the alignment issue was only present in Unit 2.

Corrective Action Reference: CR 18-08748

Performance Assessment:

Performance Deficiency: The station failed to properly preplan maintenance such that the manipulation of one ACTM card would not affect the seating of another ACTM card due to the

misalignment of the cards during work planning meetings. The misalignment was a known deficiency that was documented in their corrective action program.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the procedure quality attribute of the Initiating Events Cornerstone and affected the associated cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the station failed to consider the adverse consequences due to the ACTM card misalignments when generating work instructions to manipulate those cards. This ultimately caused a control rod to drop to the bottom of the core resulting in an automatic reactor trip.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. The inspectors determined that the finding had a very low safety significance (Green) because the finding resulted in a reactor trip, but did not involve a loss of mitigating equipment relied upon to transition the plant to a stable shutdown condition.

Cross-cutting Aspect: The finding has a cross-cutting aspect in the area of human performance associated with the work management component because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority. Specifically, the work was not effectively planned and executed by incorporating risk insights and controlling job site conditions, and the work process did not incorporate contingency plans, compensatory actions, or abort criteria as needed to prevent potential adverse consequences of known alignment problems with ACTM cards. [H.5]

Enforcement:

Violation: Technical Specification 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures listed in Appendix A to Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Section 9.a, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly planned and performed in accordance with written procedures appropriate to the circumstances.

Contrary to the above, on May 23, 2018, the licensee performed maintenance that can affect the performance of safety-related equipment which was not properly planned and performed in accordance with written work instructions that were appropriate to the circumstances. Specifically, work instructions in Work Order 5006012 were not appropriate because they failed to address how to prevent unseating an ACTM card while seating another card, causing a loss of electrical continuity to an unaffected control element assembly.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy because of its very low safety significance (Green) and was entered in to the licensee's corrective action program as CR 18-08748.

Failure to Establish an Adequate Procedure for Control of Potential Tornado Borne Missiles			
Cornerstone	Significance	Cross-cutting Aspect	Inspection Procedure
Mitigating Systems	Green NCV 05000529/2018004-002 Closed	[H.3] – Human Performance, Change Management	71111.20 — Refueling and Other Outage Activities
<p>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 prescribe instructions appropriate to the circumstances for the control and monitoring of transient missile hazards that have the potential to affect the operability of the essential spray ponds.</p>			
<p><u>Description:</u> On September 28, 2018, the inspectors performed a walkdown of the yard area around Unit 2 and identified a large number of unsecured potential tornado borne missile (PTBM) hazards within 400 feet of the Unit 2 essential spray ponds. A PTBM is defined as an object that could become airborne during a tornado and be transported to the essential spray ponds. In addition, the object could damage the spray pond nozzles when it impacts the exposed spray nozzles or nozzle piping. The unsecured PTBMs included piping spool pieces, rubber hoses, large toolboxes, wire material storage baskets, wooden pallets, piping storage racks, and metal stanchions. The materials had been staged in preparation for draining a portion of the essential spray pond system to facilitate piping inspections during the October 2018 refueling outage. The inspectors noted that many of the PTBMs were not labelled with PTBM permit tags as required. The inspectors notified the Unit 2 shift manager of the potentially nonconforming condition.</p> <p>On October 12, 2018, the inspectors were performing walkdowns near the Unit 2 essential spray ponds and noted several hundred scaffolding poles, wooden boards, and miscellaneous scaffolding components staged near the essential spray pond pump house. The inspectors observed that many of the scaffolding materials were bound together with a lightweight nylon rope that would be insufficient to restrain the materials from becoming airborne during a design basis tornado event. The inspectors informed the licensee’s outage control center of this potentially nonconforming condition.</p> <p>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, Section 3.5.1.4. The key input into this analysis is the maximum missile density near each of the station’s essential spray ponds. Higher missile densities lead to an increase in the probability that the essential spray pond will not be able to perform its function to provide cooling following a tornado. The probabilistic analysis concluded that a tornado event will not cause the loss of the heat removal function of the essential spray ponds so long as the licensee manages the storage of loose materials within the transient missile density limit. If the PTBM density limit is exceeded, however, the presumption of essential spray pond operability following a tornado event is lost.</p>			

The licensee uses Procedure 01DP-0XX01, "Control and Monitoring of Potential Tornado Borne Missiles," Revision 4, to maintain the license basis density limits for PTBM hazards. This procedure contains guidance for licensee personnel to be able to identify and control PTBM hazards. Transient items that meet the definition of a PTBM must be identified and tagged with a permit and entered into the licensee's database for tracking PTBMs to ensure the operability limits are not exceeded.

For the piping spool pieces and other components identified on September 28, 2018, licensee maintenance personnel had not accurately accounted for all PTBMs. PTBM permit tags were found on only a few of the items. The number of items that had been entered into the licensee's tracking database was 12. However, after questioning from the inspectors, the licensee evaluated the staged material and identified that at least 64 items met the definition of a PTBM. The operability limit defined in Procedure 01DP-0XX01 is 30 PTBMs within any 10,000 square foot area. The licensee determined that maintenance personnel had been unclear of how to identify PTBMs and establish accurate quantities when creating a PTBM permit and had obtained permits for groups of material rather than individual items that could become separate missile hazards.

For the scaffolding materials identified on October 12, 2018, a PTBM permit had been generated for the materials, but included only seven racks and five equipment bins. The many scaffolding poles, boards, and other equipment were not recognized as separate PTBMs and were not included in quantity of materials entered into the PTBM database. Thus, for both examples identified by the inspectors, the licensee had unknowingly exceeded the analyzed PTBM density limits for which the essential spray ponds could be presumed to remain operable following a tornado event.

Operations personnel use the PTBM database to monitor the margin to the PTBM density limits and ensure the essential spray ponds remain operable. Without an accurate number of PTBM items entered into the database, the licensee had not questioned the operability of the essential spray ponds until challenged by the inspectors.

The licensee evaluated these conditions under Condition Reports 18-14363, 18-15171, and 18-16311. The licensee concluded that Procedure 01DP-0XX01, "Control and Monitoring of PTBMs," is poorly written and confusing to follow. The procedure was first issued as an engineering procedure in 2010 and the procedure formatting and structure has remained technical in nature rather than providing explicit instructions for how to implement a defined process. The licensee also concluded that despite its title of "Control and Monitoring of PTBMs," the procedure is not structured to facilitate control or monitoring. The procedure did not contain directions for controlling PTBMs to minimize high density clusters and did not facilitate monitoring localized densities within the PTBM tracking database. The inspectors verified that the licensee generated action item 18-14363-015 to revise Procedure 01DP-0XX01 to address these deficiencies.

Corrective Action: The licensee took immediate corrective action by removing the transient PTBMs from the vicinity of the Unit 2 essential spray ponds.

Corrective Action References: Condition Reports 18-14363, 18-15171, and 18-16311

Performance Assessment:

Performance Deficiency: The licensee's failure to establish an adequate procedure for the control and monitoring of potential tornado borne missiles 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, as a result of unclear instructions, the licensee failed to control the storage of loose material that constituted potential tornado borne missile hazards in the vicinity of the Unit 2 spray ponds, and as a result exceeded 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. 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, to 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 six days 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 $2.1E-9$ 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 $1.0E-7$, the 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 emergency diesel generators.

Cross-cutting Aspect: The finding has a cross-cutting aspect in the area of human performance associated with the change management component because licensee leaders

failed to use a systematic process for implementing change so that nuclear safety remains the overriding priority. Specifically, when Procedure 01DP-0XX01 was initially issued in 2010, it was accompanied by several other program elements designed to raise awareness of the potential tornado borne missile program. These other program elements included issuance of a communications plan, site-wide news releases, periodic mandatory employee training, designated area owners, and operations department PTBM performance indicators. Since 2010, the licensee has terminated most of these other elements of the PTBM program. The licensee failed to re-evaluate and reinforce Procedure 01DP-0XX01 to compensate for removing the other program elements that were designed to ensure the PTBM program standards were met. [H.3]

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," requires that activities affecting quality shall be prescribed by instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with those instructions, procedures, or drawings. Updated Final Safety Analysis Report, Section 3.5.1.4, "Missiles Generated by Natural Phenomena (Tornados)," provided probabilistic criteria to ensure essential spray pond operability. Study 13-NS-A106, "Probabilistic Risk Assessment of Potential Tornado Missile Damage to the Station Ultimate Heat Sink," Revision 0, provided the missile density requirements to ensure the probabilistic criteria in the UFSAR, Section 3.5.1.4, are met. Procedure 01DP-0XX01, "Control and Monitoring of Potential Tornado Borne Missiles," Revision 4, implemented the control of transient missile hazards, an activity affecting quality, to ensure the missile density requirements of Calculation 13-NS-A106 and, therefore, the operability requirements for spray pond nozzles are met.

Contrary to the above, since 2010, Procedure 01DP-0XX01, intended to implement the control and monitoring of transient missiles that could have an effect on the operability of the essential spray ponds, an activity affecting quality, was not appropriate to the circumstances. Specifically, licensee personnel failed to establish instructions to ensure that potential tornado missile density criteria are understood and controlled within limits.

Enforcement Action: This violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy because of its very low safety significance (Green) and was entered in to the licensee's corrective action program as CR 18-14363.

EXIT MEETINGS AND DEBRIEFS

On October 19, 2018, the inspectors presented the inservice inspection activities inspection results to Mr. B. Rash, Vice President, Engineering, and other members of the licensee staff. The inspector confirmed that proprietary information was controlled to protect from public disclosure.

On November 5, 2018, the inspector presented the Unit 2 Polar Crane inspection results to Mr. M. McLaughlin, Vice President, Operations Support, and other members of the licensee staff. The inspector verified no proprietary information was retained or documented in this report.

On November 9, 2018, the inspectors presented the triennial heat sink performance inspection results to Ms. M. Lacal, Senior Vice President, and other members of the licensee staff. The inspectors verified no proprietary information was retained or documented in this report.

On December 14, 2018, the inspector communicated the emergency action level and emergency plan changes inspection results telephonically to Ms. C. Shields, Manager, Emergency Preparedness, and other members of the licensee staff. Unless otherwise noted, no proprietary information was retained by the inspector or documented in this report.

On December 27, 2018, the inspector presented the licensed operator requalification inspection results to Mr. D. Elkinton, Section Leader Compliance, and other members of the licensee staff. The inspectors verified no proprietary information was retained or documented in this report.

On January 2, 2019, the inspectors presented the quarterly resident inspector inspection results to Mr. B. Rash, Vice President, Engineering, and other members of the licensee staff. The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

THIRD PARTY REVIEWS

The inspectors reviewed a World Association of Nuclear Operator reports that was issued during the inspection period.

DOCUMENTS REVIEWED

71111.04—Equipment Alignment

Procedures Number	Title	Revision
40OP-9SI01	Shutdown Cooling Initiation	56
40ST-9SI12	Shutdown Cooling Flow Verification	8
40ST-9SI07	High Pressure Safety Injection System Alignment Verification	21

Drawings Number	Title	Revision
01-M-SIP-001	P&I Diagram Safety Injection and Shutdown Cooling System	43
01-M-SIP-001	P&I Diagram Safety Injection & Shutdown Cooling System	57
01-E-PHA-001	Single Line Diagram 480V Class 1E Power System Motor Control Center M31	21
01-E-PHA-003	Single Line Diagram 480V Class 1E Power System Motor Control Center M33	30
01-E-PHA-005	Single Line Diagram 480V Class 1E Power System Motor Control Center M35	15

71111.05AQ—Fire Protection Annual/Quarterly

Work Orders

5024637 5033525 4850349

Miscellaneous

Documents

Number	Title	Revision
	PVNGS Pre-Fire Strategies Manual	26

71111.07—Heat Sink Performance

Condition Reports

16-03487 16-02624 17-04346 16-18445 16-02413

Condition Reports Generated During the Inspection

18-18022	18-18023	18-18087	18-18088	18-18142
----------	----------	----------	----------	----------

Work Orders

4752012	4264546	4414212	4210815	4210816	4403647	4396131
---------	---------	---------	---------	---------	---------	---------

Procedures Number	Title	Revision
73DP-9ZZ11	Heat Exchanger Program	15
40DP-0OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment	45
74DP-9CY04	Systems Chemistry Specifications	96
40OP-9AF01	Essential Auxiliary Feedwater System	66
40OP-9PC01	Fuel Pool Cooling	16

Drawings Number	Title	Revision
M021-00207	Oil Cooler Whitlock Type 1-R-4	F
13-C-SPS-375	Nuclear Service Spray Ponds Plan	14

Miscellaneous Documents Number	Title	Revision or Date
	1PCB Heat Exchanger Thermal Performance Analysis for 1R16	October 29, 2011
	1PCB Heat Exchanger Thermal Performance Analysis for 1R15	April 13, 2010
	1PCB Heat Exchanger Thermal Performance Analysis for 1R14	October 16, 2008
	1PCB Heat Exchanger Thermal Performance Analysis for 1R13	June 8, 2007
VTD-S445-0002	Installation, Operation & Maintenance For Struthers Wells Corp. Fuel Pool Heat Exchangers	0
VTD-S445-0006	Specifications, Spare Parts, Special Tools, and Torque Requirements for Struthers Wells Corp. Fuel Pool Heat Exchangers	0
VTD-S445-0007	Specifications, Spare Parts, Special Tools, and Torque Requirements for Struthers Sells Corp. Essential Cooling Water Heat Exchangers	0

Miscellaneous Documents Number	Title	Revision or Date
VTD-C150-00014	Carrier Application Data for the Condenser and Economizer (Essential Chiller)	2
	Revised Response to NRC Generic Letter (GL) 89-13 Recommended Actions	October 1, 1993
	Annual 10 CFR 50.59, 10 CFR 72.48 and Commitment Change Report (January – December 2005)	December 22, 2006
1MPCAE01	Eddy Current Inspection Summary – Fuel Pool Cooler PCAE01	February 2016
1MPCBE01	Eddy Current Inspection Summary – Fuel Pool Cooler PCBE01	February 2016
2MPCAE01	Eddy Current Inspection Summary – Fuel Pool Cooler PCAE01	February 2015
2MPCBE01	Eddy Current Inspection Summary – Fuel Pool Cooler PCBE01	February 2015
3MPCAE01	Eddy Current Inspection Summary – Fuel Pool Cooler PCAE01	January 2015
3MPCBE01	Eddy Current Inspection Summary – Fuel Pool Cooler PCBE01	February 2015
	Essential Cooling Water Heat Exchanger Thermal Performance Test Report	October 31, 2012
	Essential Cooling Water Heat Exchanger Thermal Performance Test Report	April 23, 2014
	Essential Cooling Water Heat Exchanger Thermal Performance Test Report	May 1, 2017
FAI 13-0471	Evaluation of Acceptance Criteria Based on Waterhammer Phenomena in the AF Piping for APS Nuclear Generating Station, Units 1, 2 and 3	0
FAI 14-0364	Evaluation of Acceptance Criteria Based on Waterhammer Phenomena in the PC Piping for APS Nuclear Generating Station, Units 1, 2 and 3	0
13-MM-0021	Material Requisition for Auxiliary Feedwater Pumps	13
DMWO 4011490	Engineering Disposition for Spray Pond Wall Refurbishment	1
13-CN-0365	Specification for Forming, Placing, Finishing, and Curing of Grout and Concrete	11

Calculations Number	Title	Revision
RE-01-C19-2014	U1R18 As-Left Spent Fuel Pool Decay Heat Projections	0
13-NC-PC-0203	Loss of Spent Fuel Pool Cooling Evaluations	3
13-MC-PC-0217	Spent Fuel Cooling System – Shutdown Cooling and Pool Cooling Heat Transfer Evaluation	5
13-MC-SP-0306	MINET Hydraulic Analysis of SP System	5
13-MC-SP-0307	SP/EW System Thermal Performance Design Bases Analysis	9
SDOC 02-MN950-A00003	EW Heat Exchanger Replacement - B&W Essential Cooling Water Heat Exchanger Thermal-Hydraulic Performance & Flow-Induced Vibration Report	0

71111.08—Inservice Inspection Activities

Condition Reports

17-04807	17-06872	17-07462	17-08423	17-08521
17-08756	17-09718	17-1114	17-12329	17-13114
17-15464	18-00733	18-00942	18-02177	18-02487

Work Orders

4704651	4791185	4595676	4718617	5024637
---------	---------	---------	---------	---------

Procedures Number	Title	Revision
73DP-9WP04	Welding and Brazing Control	20
73DP-9WP05	Weld Filler Material Control	10
73TI-0ZZ13	Radiographic Examination	20
73TI-9ZZ05	Dry Magnetic Particle Examination	19
73TI-9ZZ07	Liquid Penetrant Examination	18
73TI-9ZZ09	Ultrasonic Examination of Pipe and Vessel Welds	17
73WP-0ZZ04	Welding of Carbon and Low Alloy Steels to Stainless and Nickel Alloys	19
73WP-0ZZ05	Welding of Ferritic and Martensitic Steels	15
73WP-0ZZ20	Visual Inspection of Code Welds	9
75RP-9RP30	Radiation Protection Oversight of Radiography	2

Procedures Number	Title	Revision
70TI-9ZC01	Boric Acid Walkdown Leak Detection	21
73DP-9ZC01	Boric Acid Corrosion Control Program	8
EPRI-PIPE-MPA-1	Procedure for Manual Phased Array Examination of Austenitic and Ferritic Pipe Welds	2
PDI-UT-5	PDI Generic Procedure for the Straight Beam Ultrasonic Examination of Bolts and Studs,	2
PDI-UT-8	PDI Generic Procedure for the Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	2
PDI-UT-11	PDI Generic Procedure for the Ultrasonic Examination of Reactor Pressure Vessel Nozzle-to-Shell Welds and the Nozzle Inner Corner Radius	1
PDI-UT-10	PDI Generic Procedure for the Ultrasonic Examination of Dissimilar Metal Welds	2
PDI-UT-1	PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds	2
PDI-UT-2	PDI Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	3
PDI-UT-3	PDI Generic Procedure for the Ultrasonic Through-Wall Sizing of Planar Flaws in Similar Metal Piping Welds	1

Miscellaneous Documents

Number	Title	Date
Audit 2017-003	Engineering Programs	December 6, 2017
102-07657-MLL/TNW	Palo Verde Nuclear Generating Station Units 1, 2, and 3, Docket Nos. STN 50-528/529/530 Supplement to Relief Request 56 - Unit 2, Third 10-Year Inservice Inspection (ISI) Interval Extension	March 2, 2018
SWMS No. 4362861	Formal Self-Assessment of the Inservice Inspection Program	August 16, 2013
SWIMS No.17-09564	Welding Program Self-Assessment	June 30, 2017

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports

18-19310	18-19315	18-05351	18-06620	18-17047
17-01597	17-00651	17-02134	16-20182	16-19366

Condition Reports

17-00284	17-06366	17-03722	17-02671	17-08110
17-10495	17-10434	17-00092	17-00521	17-01060
17-01076	17-01439	17-01470	17-02201	17-02378
17-02541	18-00450	18-02315	18-02693	18-04454

Work Orders

4928401

Procedures Number	Title	Revision
73TI-9MB05	Main Turbine Operations to Support Validation Testing of the EX2100E Main Generator Excitation System Post Generator Stator Rewind	0
40ST-9RC01	RCS and Pressurizer Heat-up and Cooldown Rates	19
15DP-00T02	LOCT Annual and Biennial Operating Exam Sample Plan Development	5
15DP-00T03	LOCT Biennial Written Exam Development and Sample Plan	5
15DP-00T04	LOCT Annual and Biennial Exam Administration	6
15DP-00T05	NRC Examination Security	8
15DP-00T06	LOCT Scenario and JPM Development	4
	LOCT Training Program Description	70
15DP-0CC01	Simulator Operator Feedback	2
5DP-0CC02	Simulator Design Control	2
15DP-0CC03	Simulator Loadout Control	3
15DP-0CC04	Simulator Performance Testing	3
15DP-0TR70	Simulator Configuration	4
PV-1281	Exam Security Briefing Checklist	5
PV-1282	Pre-Exam Activities Security Checklist	2
PV-1283	Simulator Pre-Exam Activities Security Checklist	9
PV-1286	Initial License Exam Security Checklist for Admin JPMs	5
PV-1822	Initial License Exam Security Checklist for Written Examinations	1
PV-1824	Initial License Exam Security for Simulator Scenarios	2

Procedures Number	Title	Revision
01DP-0EM13	Licensed Operator Medical Examinations	11
40DP-0OP09	Operator Licensing and Requalification Process	1

Miscellaneous Documents Number	Title	Revision or Date
	2018 LOCT Operations Test Sample Plan	0
	Operations Training Critical Task List	12
	Written Exam Remediation December 2017	
	Written Exam Remediation #1 December 2018	
	Written Exam Remediation #2 December 2018	

71111.12—Maintenance Effectiveness

Condition Reports

18-01796	VC-MMH1-18-001
----------	----------------

Quality Records

54214832	54214833	54214834	54214835	54214837	54214840	54214864
54214865	54215151	54215457	54215458	54215467	54215477	54215481
54215489	54215490	54215713	54215715	54215716	54215717	54215718
54215720	54216789	54216795	54216801	54216803	54216804	54216837
54216849	54216850	54216855	54216856	54217047	54217048	54217049
54217050	54217051	54217052	54217251	54217256	54217777	54217820
54217821	54217845	54217849	54217850	54217898	54218089	54218220
54218226	54218227	54218228	54218229	54218230	54218232	54218234
54218236	54218237	54218238	54218240	54218242	54218243	54218244
54218245	54218246	54218541	54218548	54218551	54218552	54218553
54218560	54218565	54218566	54218567	54218568	54219237	54219250
54219506	54219568	54219603	54220093	54220096	54220099	54220128
54220180	54220221	54220340	54220963	54221321	54221403	54222066
54222273	54222274	54227399	54232514	54232515	54238523	54238524
54241230	54241706	54241707	54273380	54300927	54357112	52596991
52596992	52596993	52596989	52596994	52596996	52410653	

Work Orders

4151870-24

71111.13—Maintenance Risk Assessments and Emergent Work Control

Condition Reports

18-15424	18-05353	16-12956	10-00150	15-08614
18-08748	17-09075	15-11063	18-05303	18-06515

Work Orders

4822983 5006012

Procedures

Number	Title	Revision
--------	-------	----------

40DP-9AP21	Protected Equipment	7
02DP-0RS01	Online Integrated Risk	7
30DP-9MP01	Conduct of Maintenance	78

Miscellaneous

Documents

Number	Title	Date
	Unit 2 Shutdown Safety Function Assessment	October 12, 2018
	Scheduler's Evaluation for PV Units 1, 2, and 3	October 4, 2018

71111.15—Operability Determinations and Functionality Assessments

Condition Reports

16-15545	14-00406	17-003961	18-15424	18-18407
17-16139	18-07701	17-16139	18-18549	18-15398
18-18548	18-18551			

Work Orders

49005003 4911770

Procedures

Number	Title	Revision
--------	-------	----------

40OP-9CH12	Refueling Water Tank (RWT) Operations	41
------------	---------------------------------------	----

Procedures Number	Title	Revision
73ST-9SI10	HPSI Pumps Miniflow – Inservice Test	52
40DP-9OP19	Locked Valve, Breaker, and Component Tracking	139

Drawings Number	Title	Revision
01-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	57

71111.18—Plant Modifications

Condition Reports

17-14312	18-08540	18-17888
----------	----------	----------

Procedures Number	Title	Revision
CN390-A00193	APS 225/35 Ton Single Failure Proof Trolley and Controls Upgrade Installation Procedure (Vendor)	1
31MT-9RC30	Reactor Vessel Head Removal and Installation	58

Drawings Number	Title	Revision or Date
54219237	Main Hoist Gearcase - Structural Welds	0
54217521	Main Hoist Equalizer - Structural Welds	0
54215467	Main Hoist Bottom Block - Structural Welds	0
54220963	Main Hoist Drum - Structural Welds	0
54219237	Main/Auxiliary Hoist Brake Base - Structural Welds	0
54214833	Trolley Truck Right - Structural Welds	0
54241707	Trolley Seismic Restraints - Structural Welds	0
54222274	Auxiliary Hoist Drum - Structural Welds	0
54216795	Auxiliary Hoist Upper Block - Structural Welds	0
CN390-A00055	SRI-Trolley Frame, Trolley Frame Weldment	0

Miscellaneous Documents

Number	Title	Revision
13-CN-390	Technical Requirements for Upgrading the Containment Building Polar Crane to Single Failure Proof	1
	Engineering Disposition for ENG-DMWO 3282819 (ZC-1311) Polar Crane Upgrade Modification	1

Miscellaneous Documents		
Number	Title	Revision
484-09275-MM/ac	APS Palo Verde Nuclear Generating Station Acceptance of the use of Nylatron for Sheaves on the Replacement Trolley Assemblies	0
	Various NDE Records for Crane System Critical Welds	
S-16-0014	10 CFR 50.59 Screening / Evaluation	3
17-F026	Final LDCR for DMWO 3282819	

Vendor Documents		
Number	Title	Revision
KNES 36676-80	Tripod Bail Load Test Procedure	2
CN-36676-21	NUREG 0612, Appendix C, Compliance Matrix for Konecranes/Konecranes Supersafe™ Single Failure Proof Trolley	1
CN-36676-22	Konecranes Nuclear Equipment and Services Supersafe™ Single Failure Proof Upgrade for Palo Verde Nuclear Generating Station Polar Crane	2
36676-23	Palo Verde Nuclear Generating Station Polar Crane Compliance Matrix	0
13-CN390-A00183	Safety Analysis Report for Konecranes Supersafe™ Single Failure Proof Trolley Palo Verde Nuclear Generating Station Polar Crane	0
2018-00899	Polar Crane QA Document folder	0
CN390-A00359	Polar Crane Unit 2 Factory Acceptance Test	0
13-CN-0390	Technical Requirements for Upgrading the Containment Building Polar Crane to Single Failure Proof (Vendor document with same document number and title as licensee document above)	0

Modification		
Number	Title	Revision
DMWO 3282819 (ZC-1311)	Polar Crane Upgrade Modification	0

Vendor Calculation		
Number	Title	Revision
CN390-A00181	Palo Verde Nuclear Generating Station – APS Main	0

Vendor Calculation Number	Title	Revision
---------------------------	-------	----------

Hoist Reeving Calculation

71111.19—Post-Maintenance Testing

Condition Reports

18-17331	3157405	18-17372	18-17577	18-17740
----------	---------	----------	----------	----------

Work Orders

4922458	4909877	4911663	5065857	5079029	4922458
---------	---------	---------	---------	---------	---------

Procedures Number	Title	Revision
-------------------	-------	----------

73DP-0XI03	Check Valve Predictive Maintenance and Monitoring Program	27
73ST-9ZZ25	Check Valve Disassembly, Inspection, and Manual Exercise	13
73ST-9XI33	HPSI Pump and Check Valve Full Flow Test	63
40ST-9DG01	Diesel Generator A Test	49
36ST-9SB04	PPS Function Test – RPS/ESFAS Logic	26

Miscellaneous Documents Number	Title	Date
--------------------------------	-------	------

Last Measurement Deviation Report October 30, 2018

71111.20—Refueling and Other Outage Activities

Condition Reports

18-18582	18-18066	18-16233	18-16164	18-14363
18-15171	18-16311			

Procedures Number	Title	Revision
-------------------	-------	----------

31MT-9ZC07	Miscellaneous Containment Building Heavy Loads	40
40MT-9ZZ01	Operations Maintenance Activities	6
78OP-9FX02	Fuel Transfer Machine	26A
40OP-9ZZ23	Outage GOP	79
01DP-0XX01	Control and Monitoring of PTBMs	4

Drawings Number	Title	Revision
54241707	SRI-Bracket, Seismic Restraint Weldment	1

Miscellaneous Documents Number	Title	Revision
3282819	Engineering Disposition for Polar Crane Upgrade Modification	0
18-18582-009	Engineering Evaluation	
53702	Event Notification Worksheet: Personnel Medical Condition	0
13-NS-A106	Missiles Generated by Natural Phenomena (Tornados)	0

Engineering Reports Number	Title	Revision
2016-00631	Engineering Document Change	2

71111.22—Surveillance Testing

Work Orders		
4909840	4928971	4932057

Procedures Number	Title	Revision
73ST-9ZZ26	Check Valve Non-intrusive Testing or Examination – Inservice Test	6
73ST-9SI06	Containment Spray Pumps and Check Valves – Inservice Test	44
73ST-9CL01	Containment Leakage Type B and C Testing	46

71114.04—Emergency Action Level and Emergency Plan Changes

Procedures Number	Title	Revision
EP-900	Emergency Response Organization (ERO) Position Checklists	17

Miscellaneous Documents

Number	Title	Date
102-7799-CS/WP	Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 and Independent Spent Fuel Storage Installation; Docket Nos. 50-528, 50-529, 50-530, and 72-44; License Nos. NPF-41, NPF-51, and NPF-74; PVNGS Emergency Plan, Revision 62	September 25, 2018
Evaluation Tracking Number 2018-002E	Effectiveness Evaluation Form, Revision 62, Palo Verde Nuclear Generating Station Emergency Plan	August 29, 2018
102-07839-CS/MA	Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 and Independent Spent Fuel Storage Installation; Docket Nos. 50-528, 50-529, 50-530, and 72-44; License Nos. NPF-41, NPF-51, and NPF-74; PVNGS Emergency Plan, Revision 63	December 6, 2018

71152—Problem Identification and Resolution

Condition Reports

18-18408	18-16091	18-07701	17-16139	18-18420
18-02569	18-16928	18-12217		

Work Orders

2891465	3326510	3490456	3250774	3374818	3374819
---------	---------	---------	---------	---------	---------

Procedures

Number	Title	Revision
31MT-9RC31	Reactor Vessel O-Ring Replacement	13
40DP-9OP26	Operations Condition Reporting Process and Operability Determination/Functional Assessment	45

Miscellaneous Documents

Number	Title	Revision or Date
	ODMI: Unit 1 Reactor Vessel Flange Indication of Leakage from Inner O-ring	1
	ODMI: Unit 3 Reactor Vessel Flange Indication of Leakage from Inner O-ring	May 22, 2018
17-16139-004	Engineering Evaluation	November 17, 2017

Vendor Documents

Number	Title	Date
	Technetics: Customer Contact Report	November 20,

Vendor Documents Number	Title	Date
		2018

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

Condition Reports

18-02605	18-08466	18-00202
----------	----------	----------

Miscellaneous Documents Number	Title	Revision or Date
18-02605-009	Unit 1 Main Turbine Excitation Trip Root Cause Evaluation	0
18-00202-027	Engineering Evaluation	July 3, 2018
CRDR 4531542	Inability of ADV 2JSGAHV0184 to Stroke Open from the Control Room and Remote Shutdown Panel	July 31, 2014

Information Request August 21, 2018
Notification of Inspection and Request for Information
Palo Verde Nuclear Generating Station, Unit 2
NRC Inspection Report 05000529/2018004

INSERVICE INSPECTION DOCUMENT REQUEST

Inspection Dates: October 11 - 18, 2018

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 October 3, 2018, 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.

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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

On October 11, 2018, a reactor inspector from the Nuclear Regulatory Commission's 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) identifies 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. Del Elkinton of your licensing organization. The tentative inspection schedule is as follows:

Preparation week: October 3 - 10, 2018

Onsite weeks: October 11 - 18, 2018

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.

[\(mail to: Wayne.Sifre@nrc.gov\)](mailto:Wayne.Sifre@nrc.gov) .

A.1 ISI/Welding Programs and Schedule Information

- a) A detailed schedule (including preliminary dates) of:
 - i. Nondestructive examinations planned for ASME Code Class Components including containment, performed as part of your ASME Section XI, risk informed (if applicable), and augmented inservice inspection programs during the upcoming outage.
 - ii. Examinations planned for Alloy 82/182/600 components that are not included in the Section XI scope (if applicable).
 - iii. Examinations planned as part of your boric acid corrosion control program (mode 3 walk downs, bolted connection walk downs, etc.)
 - iv. Welding activities that are scheduled to be completed during the upcoming outage (ASME Class 1, 2, or 3 structures, systems, or components). Include the weld identification number, description of weld, category, class, type of exam and procedure number, and date of examination.
- b) 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.

- c) 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.
- d) 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.
- e) 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.
- f) 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.
- g) A list of any temporary non-code repairs in service (e.g., pinhole leaks).
- h) Please provide copies of the most recent self-assessments for the inservice inspection, welding, and Alloy 600 programs.
- i) Copy of the procedures for NDE and welding techniques that will be used during the outage.

A.2 Boric Acid Corrosion Control Program

- a) 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.
- b) 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 walk down inspections performed as part of the boric acid corrosion control program.

A.3 Additional Information Related to all Inservice Inspection Activities

- a) A list with a brief description of inservice inspection, and boric acid corrosion control program (e.g., condition reports) 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.
- b) Provide training (e.g., Scaffolding, Fall Protection, FME, Confined Space) if they are required for the activities described in A.1 through A.4.

- c) Please provide names and phone numbers for the following program leads:
- Inservice inspection (examination, planning)
 - Containment examinations
 - Snubbers and supports
 - Site welding engineer
 - Boric acid corrosion control program

B. Information to be Provided Onsite to the Inspector at the Entrance Meeting (October 11, 2018):

B.1 Inservice Inspection / Welding Programs and Schedule Information

- a) Updated schedules for inservice inspection/nondestructive examination activities, including steam generator tube inspections, planned welding activities, and schedule showing contingency repair plans, if available.
- b) 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:
- i. Weld data sheet (traveler).
 - ii. Weld configuration and system location.
 - iii. Applicable Code Edition and Addenda for weldment.
 - iv. Applicable Code Edition and Addenda for welding procedures.
 - v. Applicable welding procedures used to fabricate the welds.
 - vi. Copies of procedure qualification records (PQRs) supporting the weld procedures from B.1.b.v.
 - vii. Copies of welder's performance qualification records (WPQ).
 - viii. Copies of the nonconformance reports for the selected welds (If applicable)
 - ix. Radiographs of the selected welds and access to equipment to allow viewing radiographs (if radiographic testing was performed).
 - x. Copies of the preservice examination records for the selected welds.
 - xi. Readily accessible copies of nondestructive examination personnel qualifications records for reviewing.
- c) 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.
- d) 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.
- e) A copy of (or ready access to) most current revision of the inservice inspection program manual and plan for the current interval.
- f) 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

- a) 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.
- b) 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 Codes and Standards

- a) 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.
- b) 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.).
- c) Boric Acid Corrosion Guidebook Revision 1 – EPRI Technical Report 1000975.

PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED
 INSPECTION REPORT 05000528/2018004, 05000529/2018004, AND 05000530/2018004 –
 January 29, 2019

DISTRIBUTION

SMorris, RA
 MShaffer, DRA
 AVegel, DRP
 MHay, DRP
 RLantz, DRS
 GMiller, DRS
 DCylkowski, RC
 ARivera-Varona, RIV/OEDO
 VDricks, ORA
 JWeil, OCA
 SLingam, NRR
 AMoreno, RIV/CAO
 BMaier, RSLO
 RKellar, IPAT
 NO'Keefe, DRP
 JDixon, DRP
 CPeabody, DRP
 DYou, DRP
 DReinert, DRP
 RBywater, DRP
 YDubay, DRP
 PJayroe, IPAT
 MHerrera, DRMA
 JVera, DRP
 R4Enforcement

Electronic Distribution for Palo Verde Nuclear Generating Station

ADAMS ACCESSION NUMBER: ML19031B145

SUNSI Review: ADAMS: Non-Publicly Available Non-Sensitive Keyword:
 By: JDixon Yes No Publicly Available Sensitive

OFFICE	DRP/SRI	DRP/RI	DRP/RI	C:DRS/EB1	C:DRS/EB2	C:DRS/OB
NAME	CPeabody	DReinert	DYou	VGaddy	FRamirez	GWerner
SIGNATURE	CAP	DRR	DDY	vgg	FCR	GEW
DATE	1/14/2019	1/11/2019	1/15/2019	1/24/19	1/25/2019	01/28/2019
OFFICE	C:DRS/PS2	TL:IPAT	C:DRP/D			
NAME	HGepford	RKellar	NOKeefe			
SIGNATURE	hfg	RLK	NFO			
DATE	1/24/2019	1/23/2019	1/29/19			

OFFICIAL RECORD COPY