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

August 13, 2015

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

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000528/2015002, 05000529/2015002, AND 05000530/2015002

Dear Mr. Edington:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Palo Verde Nuclear Generating Station Units 1, 2, and 3. On July 8, 2014, the NRC inspectors discussed the results of this inspection with Mr. J. Cadogan, Vice President, Nuclear Engineering, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented four findings of very low safety significance (Green) in this report. All 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.a of the NRC Enforcement Policy.

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

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV; and the NRC resident inspector at the Palo Verde Nuclear Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's

Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Geoffrey Miller, 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 05000528/2015002, 05000529/2015002, and 05000530/2015002
w/ Attachments:
1. Supplemental Information
2. Request for Information - Radiation Safety Team
3. Request for Information - Occupational Radiation Safety Inspection

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Letter to R. Edington from G. Miller dated August 13, 2015

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000528/2015002, 05000529/2015002, AND 05000530/2015002

DISTRIBUTION:
Regional Administrator (Marc.Dapas@nrc.gov)
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DRP Deputy Director (Ryan.Lantz@nrc.gov)
DRS Director (Anton.Vegel@nrc.gov)
DRS Deputy Director (Jeff.Clark@nrc.gov)
Senior Resident Inspector (Charles.Peabody@nrc.gov)
Resident Inspector (Dustin.Reinert@nrc.gov)
Resident Inspector (David.You@nrc.gov)
Reactor Inspector, DRS/EB1 (Lindsay.Brandt@nrc.gov)
Branch Chief, DRP/D (Geoffrey.Miller@nrc.gov)
Senior Project Engineer, DRP/D (Bob.Hagar@nrc.gov)
Project Engineer, DRP/D (Jan.Tice@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
Public Affairs Officer (Lara.Uselding@nrc.gov)
Project Manager (Margaret.Watford@nrc.gov)
Acting Team Leader, DRS/TSS (Eric.Ruesch@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
ACES (R4Enforcement.Resource@nrc.gov)
Regional Counsel (Karla.Fuller@nrc.gov)
Technical Support Assistant (Loretta.Williams@nrc.gov)
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000528, 05000529, 05000530
License:	NPF-41, NPF-51, NPF-74
Report:	05000528/2015002, 05000529/2015002, 05000530/2015002
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station
Location:	5801 South Wintersburg Road Tonopah, Arizona 85354
Dates:	April 1 through June 30, 2015
Inspectors:	C. Peabody, Senior Resident Inspector D. Reinert, PhD, Resident Inspector D. You, Resident Inspector L. Brandt, Project Engineer L. Carson II, Senior Health Physicist G. George, Senior Reactor Inspector N. Greene, PhD, Health Physicist P. Hernandez, Health Physicist P. Jayroe, Reactor Inspector J. Reynoso, Resident Inspector A. Sanchez, Senior Resident Inspector G. Replogle, Senior Reactor Analyst
Approved By:	Geoffrey B. Miller Chief, Project Branch D Division of Reactor Projects

SUMMARY

IR 05000528, 529, 530/2015001; 4/1/2015 – 6/30/2015; Palo Verde Nuclear Generating Station Units 1, 2, and 3, Integrated Inspection Report, Operability Determinations and Functionality Assessments; Problem Identification and Resolution; and Follow-up of Events and Notices of Enforcement Discretion.

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

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50 Appendix B, Criterion XVI for the failure to take timely corrective actions associated with failure of the discharge pulsation dampener poppet valves in the positive displacement charging pump. The charging system. is designated as quality related for its function to provide a boration flowpath to the reactor coolant system. Specifically, following the investigation of a degrading discharge dampener bladder on the Unit 2 charging pump E and the discovery that the poppet valve stem was galled and stuck in the poppet valve seat, the licensee incorrectly concluded that routine monthly monitoring and the 5-year bladder replacement maintenance would identify further failures in the other charging system trains. The licensee entered this issue into the corrective action program as Condition Report 15-4230.

  Failure to take timely corrective actions to replace the charging pump discharge dampener poppet valve assemblies was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it is associated with the equipment performance attribute and directly affected the Initiating Event 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 failure to correct this condition adverse to quality resulted in a reactor coolant system transient and challenged normal plant operations. Using Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At Power," the inspectors determined the finding was of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding has an evaluation cross-cutting aspect in the area of problem identification and resolution because the organization did not thoroughly evaluate issues to ensure that resolutions address causes and extent of condition commensurate with their safety significance. Specifically, the corrective actions taken in response to the January 2014 poppet galling event included a number of engineering judgements and assumptions regarding both the degradation mechanism, and the internal workings of the sytem components were used to justify not performing additional poppet assembly

inspections. These assumptions were known to be incorrect by uninvolved technical experts inside the licensee and vendor organization. Had those assumptions been properly vetted and verified by vendor or other industry experts at the time, the extent-of-condition inspections likely would have been accelerated [P.2]. (Section 4OA2.3)

- Green. The inspectors reviewed a self-revealing non-cited violation of Technical Specification 5.4.1.a, through Regulatory Guide 1.33, Revision 2, Appendix A, Section 6.t, February 1978 for the licensee's failure to establish adequate procedures for combating emergencies and other significant events regarding a total loss of charging pumps due to gas binding that affected reactor coolant system pressure and level control. On March 20, 2015, after Unit 2 experienced a total loss of charging, operators relied on a normal operating procedure which did not address how to combat a total loss of charging flow due of gas binding from a failed discharge pulsation dampener. The licensee entered this issue into the corrective action program as Condition Report 15-4230.

  The failure to provide adequate procedures for combating emergencies and other significant events regarding a total loss of charging pumps due to gas binding that affected reactor coolant system pressure control was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it is associated with the procedure quality attribute and directly affected the Initiating Event 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 lack of adequate procedural guidance challenged reactor operators during the loss of charging event. In accordance with Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," the performance deficiency was determined to be of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance because the decision to eliminate the abnormal operating procedure and not to train reactor operators was made in 1997. (Section 4OA3.4)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, involving the failure to maintain adequate design control measures associated with the ultimate heat sink. Specifically, the essential spray pond crosstie valves did not meet design requirements established in Regulatory Guide 1.117, "Tornado Design Classification," as described in the Updated Final Safety Analysis Report. Consequently, if the crosstie valves were damaged by a tornado, the licensee would not have enough available water inventory to meet the mission time of the essential spray pond system. The licensee has added steps to their emergency operating procedure to instruct operators to open the crosstie valves to achieve and maintain long-term cooling subsequent to a design-basis tornado event, and is evaluating potential plant modifications. The licensee has entered this issue into the corrective action program as Palo Verde Action Request 4633058.

  The failure to verify the design of the essential spray pond system in accordance with Regulatory Guide 1.117 was a performance deficiency. This performance deficiency was more-than-minor and is a finding because it affected the protection against external factors attribute of the Mitigating Systems Cornerstone objective of ensuring the capability of

systems that respond to initiating events to prevent undesirable consequences. Specifically, if the crosstie valves were damaged by a tornado, the licensee would not have enough available water inventory to meet the mission time for one train of the essential spray pond system during accident conditions. The inspectors performed the initial significance determination for the performance deficiency using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating System Screening Questions," dated July 1, 2012. The finding required a detailed risk evaluation because it involved the potential loss of a safety system, in that after at least 13 days of spray pond operation, operators were required to open the spray pond cross-connect valve to enable one train of the ultimate heat sink to use both trains of spray pond inventory. A Region IV senior reactor analyst performed a detailed risk evaluation. The design basis accident mission time was 30 days. However, the probabilistic risk assessment mission time was only 24 hours. Since the spray ponds could still perform the probabilistic risk assessment function for the probabilistic risk assessment mission time, this finding was of very low safety significance (Green). The change to the core damage frequency was much less than 1E-7/year. The finding did not contribute to the large early release frequency. Because the most likely cause of the finding does not reflect current licensee performance, no cross-cutting aspect is assigned to this finding. (Section 1R15)

- Green. The inspectors reviewed a self-revealing non-cited violation of Technical Specification 3.3.5 condition A.1 for failure to place a failed steam generator differential pressure in bypass or trip. Specifically, on January 11, 2015, after Unit 2 received a steam generator pressure difference setpoint alarm on channel B, operators failed to determine the cause of the alarm. As a result, the auxiliary feedwater actuation signal channel was inoperable for a period of 13 days, which was longer than the technical-specification allowed outage time of one hour, during which time the failed channel would provide a false negative under valid actuation setpoint conditions. The licensee entered this condition in their corrective action program and performed a root cause evaluation under Condition Report Disposition Request 4618033.

  The failure to provide adequate alarm procedures was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it affected the equipment performance attribute of the Mitigating Systems Cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the control room operators did not have an alarm response procedure for plant monitoring system (RJ) alarm on point SASB22, which resulted in the channel B auxiliary feedwater actuation signal steam generator 2 drifting out of tolerance for a period of 13 days. This exceeded the allowed outage time specified in the technical specifications. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The finding screened to a detailed risk evaluation because it involved the actual loss of function of at least a single train for greater than its technical specification allowed outage time. A Region IV senior reactor analyst performed a detailed risk evaluation and determined that the change in core damage frequency $\Delta CDF < 5E-9$ corresponds to very low (Green) safety significance. This finding has a cross-cutting aspect in the area of human performance associated with the change management component in that the licensee did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, the licensee did not use a systematic process to identify and correct the lack of alarm procedures associated with this parameter along with 76 other alarms that have technical specification implications during the design modification process for the plant computer alarm system [H.3]. (Section 4OA3.2)

PLANT STATUS

Units 1 and 2 operated at full reactor power for the entire inspection period.

Unit 3 began the inspection period at full reactor power, shut down for a planned refueling outage from April 4 through May 3, 2015, then restarted and returned to full reactor power for the remainder of the inspection period. However on May 29, Unit 3 was granted enforcement discretion to avoid a technical specification required shutdown while repairs to an inoperable high pressure safety injection pump motor could be completed (Section 4OA3.3).

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Summer Readiness for Offsite and Alternate AC Power Systems

a. Inspection Scope

On June 30, 2015, 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 assessed corrective actions for identified degraded conditions and verified that the licensee had considered the degraded conditions in its risk evaluations and had established appropriate compensatory measures.

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.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- May 12, 2015, Unit 3 high pressure safety injection system train A
- April 21, 2015 Unit 3 low pressure safety injection system train A
- June 18, 2015 Unit 1 high pressure safety injection system train 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 or trains were correctly aligned for the existing plant configuration.

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

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On April 7 and May 11, 2015, the inspectors performed a complete system walk-down inspection of the Unit 3 containment spray system. The inspectors reviewed the licensee's procedures and system design information to determine the correct containment spray lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

On May 5, 2015, the inspectors performed a complete system walk-down inspection of the Unit 2 reactor coolant system charging system. The inspectors reviewed the licensee's procedures and system design information to determine the correct system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted two complete system walk-down samples, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Inspection

a. Inspection Scope

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

- April 30, 2015, Unit 2 emergency diesel generator B room, fire zone 21B
- April 7, 2015, Unit 2 containment building, 80', 100', and 140' elevations
- June 18, 2015, Unit 1 high pressure safety injection system pump A room, fire zone 31A
- June 18, 2015, Unit 1 low pressure safety injection system pump A room, fire zone 32A

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

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

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On May 13, 2015, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose the Unit 1 auxiliary building, 40' elevation, containing risk-significant structures, systems, and components that were susceptible to flooding.

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

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

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

The activities described in subsections .1 through .4 below constitute completion of one inservice inspection sample for docket number 05000530, as defined in Inspection Procedure 71111.08.

.1 Non-destructive Examination Activities and Welding Activities

a. Inspection Scope

The inspectors directly observed the following nondestructive examinations:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Safety Injection	76-43	Ultrasonic, Liquid Dye Penetrant
Safety Injection	76-44	Ultrasonic, Liquid Dye Penetrant
Safety Injection	76-45	Ultrasonic, Liquid Dye Penetrant
Reactor Coolant System Cold Leg Instrumentation Tap	6-100	Visual Examination, VT-2

The inspectors reviewed records for the following nondestructive examinations:

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Auxiliary Feedwater	59-25	Ultrasonic, Magnetic Particle
Reactor Coolant System Cold Leg Pressure Instrumentation Tap	6-100-6, 6-100-1, 6-100-3, 6-100-7, 6-99-1, 6-99-2, 6-99-3, 6-99-4, 6-99-5, 6-99-6, 6-99-7, 6-99-8, 6-99-9, 6-99-10, 6-99-11, 6-99-12	Visual Examination, VT-2

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

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

SYSTEM	WELD IDENTIFICATION	EXAMINATION TYPE
Auxiliary Feedwater System	4404044-11	Radiographic
Auxiliary Feedwater System	4404044-13	Radiographic
Auxiliary Feedwater System	4404044-15	Radiographic

The inspectors reviewed whether the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code Section IX requirements. The inspectors also verified 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 Penetration Inspection Activities

a. Inspection Scope

The inspectors reviewed the results of the licensee's bare metal visual inspection of the reactor vessel upper head penetrations to determine whether the licensee identified any evidence of boric acid challenging the structural integrity of the reactor head components and attachments. The inspectors also verified that the required inspection coverage was achieved and limitations were properly recorded. The inspectors also reviewed whether the required inspection coverage was achieved and whether limitations were properly recorded. The inspectors 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 inspectors 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 inspectors verified the documentation associated with the licensee's boric acid corrosion control walk-down as specified in Procedure 70TI-9ZC01, "Boric Acid Leak Detection," Revision 17. The inspectors reviewed whether the visual inspections emphasized locations where boric acid leaks could cause degradation of safety significant components, and whether engineering evaluations used corrosion rates applicable to the affected components and properly assessed the effects of

corrosion induced wastage on structural or pressure boundary integrity. The inspectors 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 inspectors reviewed the steam generator tube eddy current examination scope and expansion criteria to determine whether the criteria met technical specification requirements, EPRI guidelines, and commitments made to the NRC. The inspectors also reviewed whether the eddy current inspection scope included areas of degradation that were known to represent potential eddy current test challenges such as the top of tube sheet, tube support plates, and U-bends. The inspectors observed portions of tube inspection eddy current testing activities including data acquisition and analysis. Inspectors also observed portions of tube repair activities. The scope of the licensee's eddy current examinations included:

- 100 percent full length bobbin testing using a 0.610 inch diameter bobbin probe in rows 5 and higher
- 100 percent full length bobbin testing in rows 1 through 4 using a 0.590 inch diameter bobbin probe
- 100 percent +Point inspection of bobbin flaw-like signals at tube support structures with bobbin indicated depth >15 percent through wall.
- Rotating coil "boxing" of confirmed possible loose part and observed loose part wear signals
- Special interest +Point testing of non-resolved freespan bobbin signals plus:
    - Metallic foreign object locations identified by foreign object search and retrieval
    - Newly reported possible loose part signals
    - Previously reported possible loose part signals
    - Rotating coil "boxing" of tube locations previously plugged due to foreign object wear
- 100 percent +Point inspection of dent signals >2 volts at tube
- 100 percent +Point inspection of freespan ding signals >5 volts

- 100 percent +Point inspection of peripheral tube freespan ding signals >2 volts, located within 2 inches of the top of the tube sheet
- 100 percent +Point inspection of no-tubesheet expansion sites (tube end to top of the tube sheet +3 inches) and over-expansion sites
- 10 percent of any previously unidentified dents >2 volts
- 100 percent tube plug visual inspection in all steam generators
- Foreign object search and retrieval in all steam generators
- Steam drum upper internals visual inspection of all steam generators
- Visual inspection in all steam generators of channel head primary side hot leg and cold leg

At the conclusion of the eddy current inspections, the results were as follows:

The eddy current inspections of both steam generators indicated wear at some batwing and vertical support structures in the bend region of the tubes. The licensee completed plugging repairs on 11 tubes in steam generator 31 and on 27 tubes in steam generator 32. The licensee also installed a stake in one tube in steam generator 31. The licensee did not identify any new degradation mechanisms during steam generator testing this outage.

The inspectors observed portions of the eddy current testing being performed to determine whether inspections were performed in accordance with procedural requirements. The inspectors performed a review of the site-specific techniques being used to determine whether eddy current test data analyses were adequately performed per EPRI and site-specific guidelines. The inspectors reviewed past and present eddy current test data of degraded tubes to verify degradation rates were within analytical estimations.

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 May 5 and 6, 2015, the inspectors reviewed simulator training for a licensed crew. The inspectors assessed the performance of the operators as they simulated a complete loss of charging flow and tested various strategies to handle the event and utilized normal, abnormal, and emergency operating procedures. The inspectors also assessed modeling performance of the simulator during the event scenarios.

On May 20, 2015, the inspectors observed simulator training for an operating crew during a full-scale emergency drill. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

These activities constitute completion of two 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 3, 2015, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to a plant shutdown for a refueling outage. The inspectors observed the operators' performance of the following activities:

- Shift turnover and shutdown plan reactivity briefs
- Boration and charging adjustments
- Control rod manipulations
- Turbine load reductions

In addition, the inspectors assessed the operators' adherence to plant procedures, including Procedure 40DP9-OP02, "Conduct of Shift Operations," and other operations department policies.

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed four instances of degraded performance or condition of safety-related structures, systems, and components:

- March 20, 2015, Unit 2 total loss of reactor coolant system charging due to gas binding all charging pumps

- April 22, 2015, auxiliary feedwater system ability to provide feedwater on auxiliary feedwater actuation signal

- May 14, 2015, reactor coolant system, Unit 3 reactor coolant pump 2A maintenance rule functional failure evaluation

- June 29, 2014, high pressure safety injection system availability and to provide reactor coolant inventory on a safety injection actuation signal

The inspectors performed a detailed review of the chemical volume control system with emphasis on the charging pumps. The inspectors evaluated the role of work practices and root cause evaluation to determine if degraded performance was due to work control or activities.

The inspectors reviewed the extent of condition of possible common cause structure, system and component 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 structures, systems, and components. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- April 9, 2015 Unit 3 entering yellow risk during Refueling Outage 18
- April 15, 2015, Unit 3 spent fuel pool makeup temporary alteration
- June 11, 2015, Unit 2 entering yellow risk for limit switch adjustment on safety injection system motor operated valve 676

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

The inspectors also observed portions of five 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:

- March 20, 2015, Unit 2 failed charging pump B pulsation dampener bladder, loss of charging and the restoration of the charging system

- May 7, Unit 3 emergent work to repair atmospheric discharge valve 178
- April 30, 2015, Unit 3 emergent work to repair reactor coolant pump 1A
- May 13, 2015, Unit 2 emergent work to repair class 1E battery inverter D
- May 28, 2015, Unit 3 emergent work to repair high pressure safety injection pump A motor bearing

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.

These activities constitute completion of eight 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 and functionality assessments that the licensee performed for degraded or nonconforming structures, systems, or components:

- March 20, 2015, functionality assessment of the Unit 2 charging pump bladder failure and subsequent total loss of reactor coolant system charging
- April 21, 2015, operability determination of Unit 3 safety injection valve 654 following identification of boric acid deposits
- May 2, 2014, operability determination of main pressurizer spray valve 100E being isolated to control body-to-bonnet leakage
- May 27, functionality assessment of control element drive mechanism coil temperatures greater than 350°F
- June 9, 2015, operability determination of essential spray pond crosstie valve tornado missile protection
- June 22, 2015, operability determination of containment sump with missed surveillance tests of level indicators
- June 24, 2015, operability determination of diesel generator B magnetic speed transmitter oil leak

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded structure, system, or

component 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 structure, system, or component.

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

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, involving the failure to maintain adequate design control measures associated with the ultimate heat sink. Specifically, the essential spray pond crosstie valves did not meet design requirements established in Regulatory Guide 1.117, "Tornado Design Classification," as described in the Updated Final Safety Analysis Report. Consequently, if the crosstie valves were damaged by a tornado, the licensee would not have enough available water inventory to meet the mission time of the essential spray pond system during accident conditions.

Description. The Palo Verde Nuclear Generating Station essential spray pond system provides the heat dissipation capability for the reactor and its essential auxiliary systems during normal shutdown, refueling, and accident conditions. The essential spray pond system consists of two adjacent seismic Category I concrete ponds and associated piping, valves, and pumps. Cooling water from the ponds is pumped to the diesel and auxiliary buildings where it picks up heat from safety related equipment. The heated water returns to the spray ponds where it is dissipated by evaporation to the atmosphere through the spray nozzles. The nonessential domestic water system or the nonessential cooling tower makeup system supply makeup water to the ponds. Neither of these systems are credited to function during a design basis accident.

One train of the essential spray pond equipment plus the combined water volume in both ponds provides the capability to dissipate 100 percent of the plant heat load under accident conditions. The combined water inventory of both spray ponds is required to meet the 26-day mission time of the essential spray pond system. Two manual crosstie valves are provided in the common wall between the ponds. These crosstie valves are normally closed during plant operation to maintain the essential spray ponds independent of one another. During a post-accident shutdown, if makeup water is lost, one essential spray system train must be stopped and at least one of the crosstie valves must be opened to make available the entire combined water inventory.

General Design Criterion 2 of Appendix A to 10 CFR Part 50 states that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. Regulatory Guide 1.117, "Tornado Design Classification," Revision 1, describes a method acceptable to NRC staff for identifying those structures, systems, and components that should be protected from the effects of the design basis tornado, including tornado missiles. Regulatory Guide 1.117 states that "equipment used to provide long-term core cooling following a LOCA should be protected." The essential spray pond crosstie valves are credited in licensee emergency Procedures 40EP-9EO03, "Loss of Coolant,"

and 40EP-9EO09, “Functional Recovery,” to make water inventory from both ponds available for long-term core cooling in the event that makeup is lost and not recoverable.

During a plant walkdown, the inspectors identified that the spray pond crosstie valve hand wheels and valve extension shafts were not protected from potential tornado-borne missile impacts. The inspectors informed the licensee of their concern that the valve handwheels and extension shafts may not be robust enough to withstand the impacts from all design basis tornado missiles.

In response to the inspectors' concern, the licensee initiated Palo Verde Action Request 4633058. The licensee performed a prompt operability determination to assess the unprotected essential spray pond crosstie valves. The licensee confirmed that in the event of a tornado, potential damage to both of the crosstie valves could occur. The licensee’s evaluation concluded that following a tornado event which rendered the crosstie valves unavailable to open, the available water inventory would be reduced to approximately 13 days of operation. The licensee’s immediate corrective action was to revise their adverse weather abnormal operating procedure to inspect the spray pond crosstie valves for functionality in the event a tornado was sighted near the protected area. The licensee has also added steps to their emergency operating procedure to instruct operators to open the crosstie valves to achieve and maintain long-term cooling subsequent to a design basis tornado event. The licensee is also evaluating potential plant modifications to further address General Design Criterion 2 and Regulatory Guide 1.117 requirements for the crosstie valves.

The inspectors reviewed NRC Enforcement Guidance Memorandum 15-002, “Enforcement Discretion for Tornado-Generated Missile Protection Non-Compliance” dated June 10, 2015. Because the licensee had successfully restored operability using compensatory measures, the inspectors determined that while the licensee addresses this finding within their corrective-action program, enforcement discretion is not required in this instance.

Because the most likely cause of this finding was not representative of current licensee performance, the inspectors did not assign a cross-cutting aspect to this finding.

Analysis. The failure to verify the design of the essential spray pond system in accordance with Regulatory Guide 1.117 was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it affected the protection against external factors attribute of the Mitigating Systems Cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, if the crosstie valves were damaged by a tornado, the licensee would not have enough available water inventory to meet the mission time for one train of the essential spray pond system during accident conditions. The inspectors performed the initial significance determination for the performance deficiency using NRC Inspection Manual 0609, Appendix A, Exhibit 2 "Mitigating System Screening Questions," dated July 1, 2012. The finding required a detailed risk evaluation because it involved the potential loss of a safety system, in that after at least 13 days of spray pond operation, operators were required to open the spray pond cross-connect valve to enable one train of the ultimate heat sink to use both trains of spray pond inventory. A Region IV senior reactor analyst performed a detailed risk evaluation. The design-basis accident mission time was 30 days. However, the probabilistic risk assessment mission time was only 24 hours. Since the spray ponds could still perform

the probabilistic risk assessment function for the probabilistic risk assessment mission time, this finding was of very low safety significance (Green). The change to the core damage frequency was much less than 1E-7/year. The finding did not contribute to the large early release frequency. Because the most likely cause of the finding does not reflect current licensee performance, no cross-cutting aspect is assigned to this finding.

Enforcement. Title 10 of the *Code of Federal Regulations* Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. The Updated Final Safety Analysis Report, Revision 17, Section 1.8 states that the licensee is committed to Regulatory Guide 1.117, "Tornado Design Classification," Revision 1. Regulatory Guide 1.117 states that equipment used to provide long-term core cooling following a loss of coolant accident should be protected from the effects of the design basis tornado and tornado missiles. Contrary to the above, prior to June 17, 2015, the essential spray pond system crosstie valves, equipment used to provide long-term cooling following a loss of coolant accident, were not protected from the effects of the design basis tornado and tornado missiles. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Palo Verde Action Request 4633058, this violation is being treated as a non-cited violation in accordance with Section 2.3.2.a of the Enforcement Policy:
NCV 05000528/2015002-01, "Failure to Verify the Design of the Essential Spray Pond System Crosstie Valves."

1R18 Plant Modifications (71111.18)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed three permanent plant modifications that affected risk-significant structures, systems, and components:

- May 8, 2015, modification to use charging pump suction and discharge nitrogen bladders made of Nitrile (Buna-N) material instead of EPR bladders due to undesired nitrogen permeation rates
- May 28, 2015, Unit 3 essential spray pond train B flow orifice bypass valve
- June 23, 2015, Unit 2 plant computer system upgrade

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

These activities constitute completion of three samples of permanent 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 seven post-maintenance testing activities that affected risk-significant structures, systems, or components:

- March 20, 2015, Unit 2 reactor coolant system charging systems following restoration of gas bounding of all charging pumps
- March 20, 2015, Unit 2 following repair of charging pump B discharge pulsation dampener
- May 19, 2015, Unit 2 control element drive mechanisms upper gripper coil voltage adjustments following diagnostic testing
- May 7, Unit 3 atmospheric discharge valve 178 testing following corrective maintenance
- April 29, 2015, Unit 3 safety injection tank 2A fill and drain valve following corrective maintenance
- May 22, 2015, Unit 2 Class 1E battery D output breaker lamp replacement following unplanned breaker trip
- May 27, 2015, Unit 3 low pressure safety injection pump B following routine maintenance

The inspectors reviewed licensing- and design-basis documents for the structures, systems and components 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 structures, systems and components.

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

During the Unit 3 refueling outage that concluded on May 3, 2015, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee

considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

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

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

In-service tests:
- April 6, 2015, Unit 2 essential chilled water pump A test
- May 26, 2015, Unit 3 diesel fuel oil transfer pump A test

Containment isolation valve surveillance tests:
- April 9, 2015, Unit 3, integrated containment leak rate test
- April 16, 2015, Unit 3 refueling water tank isolation valve B test
- April 23, 2015, Unit 3 containment penetration 62 local leak rate test

Other surveillance tests:
- April 14, 2015, Unit 2 plant protection system channel A calibration
- May 13, 2015, Unit 1 plant protection system functionality test

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

These activities constitute completion of seven surveillance testing inspection sample, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

Training Evolution Observation

a. Inspection Scope

On May 20, 2015, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of one training observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

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

- The hazard assessment program, including a review of the licensee's evaluations of changes in plant operations and radiological surveys to detect dose rates, airborne radioactivity, and surface contamination levels

- Instructions and notices to workers, including labeling or marking containers of radioactive material, radiation work permits, actions for electronic dosimeter alarms, and changes to radiological conditions

- Programs and processes for control of sealed sources and release of potentially contaminated material from the radiologically controlled area, including survey performance, instrument sensitivity, release criteria, procedural guidance, and sealed source accountability

- Radiological hazards control and work coverage, including the adequacy of surveys, radiation protection job coverage and contamination controls, the use of electronic dosimeters in high noise areas, dosimetry placement, airborne radioactivity monitoring, controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools, and posting and physical controls for high radiation areas and very high radiation areas

- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

- Audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

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

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

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

- Site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements

- ALARA work activity evaluations/post-job reviews, exposure estimates, and exposure mitigation requirements

- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies

- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry

- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas

- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

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

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

The inspectors evaluated whether the licensee maintained gaseous and liquid effluent processing systems and properly mitigated, monitored, and evaluated radiological discharges with respect to public exposure. The inspectors verified that abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out of service, were controlled in accordance with the applicable regulatory requirements and licensee procedures. The inspectors verified that the licensee's quality control program ensured radioactive effluent sampling and analysis adequately quantified and evaluated discharges of radioactive materials. The inspectors verified the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors interviewed licensee personnel and reviewed or observed the following items:

- Radiological effluent release reports since the previous inspection and reports related to the effluent program issued since the previous inspection

- Effluent program implementing procedures, including sampling, monitor setpoint determinations and dose calculations

- Equipment configuration and flow paths of selected gaseous and liquid discharge system components, filtered ventilation system material condition, and significant changes to their effluent release points, if any, and associated 10 CFR 50.59 reviews

- Selected portions of the routine processing and discharge of radioactive gaseous and liquid effluents (including sample collection and analysis)

- Controls used to ensure representative sampling and appropriate compensatory sampling

- Results of the inter-laboratory comparison program

- Effluent stack flow rates

- Surveillance test results of technical specification-required ventilation effluent discharge systems since the previous inspection

- Significant changes in reported dose values
- A selection of radioactive liquid and gaseous waste discharge permits
- Part 61 analyses and methods used to determine which isotopes are included in the source term
- Offsite dose calculation manual changes
- Meteorological dispersion and deposition factors
- Latest land use census
- Records of abnormal gaseous or liquid tank discharges
- Groundwater monitoring results
- Changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater
- Identified leakage or spill events and entries made into 10 CFR 50.75(g) records, if any, and associated evaluations of the extent of the contamination and the radiological source term
- Offsite notifications and reports of events associated with spills, leaks, and groundwater monitoring results
- Audits, self-assessments, reports, and corrective action documents related to radioactive gaseous and liquid effluent treatment since the last inspection

These activities constitute completion of one sample of radioactive gaseous and liquid effluent treatment, as defined in Inspection Procedure 71124.06.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

The inspectors evaluated whether the licensee's radiological environmental monitoring program quantified the impact of radioactive effluent releases to the environment and sufficiently validated the integrity of the radioactive gaseous and liquid effluent release program. The inspectors verified that the radiological environmental monitoring program was implemented consistent with the licensee's technical specifications and offsite dose calculation manual, and that the radioactive effluent release program met the design objective in Appendix I to 10 CFR Part 50. The inspectors verified that the licensee's radiological environmental monitoring program monitored non-effluent exposure pathways, was based on sound principles and assumptions, and validated that doses to members of the public were within regulatory dose limits. The inspectors reviewed or observed the following items:

- Annual environmental monitoring reports and offsite dose calculation manual
- Selected air sampling and dosimeter monitoring stations
- Collection and preparation of environmental samples
- Operability, calibration, and maintenance of meteorological instruments
- Selected events documented in the annual environmental monitoring report which involved a missed sample, inoperable sampler, lost dosimeter, or anomalous measurement
- Selected structures, systems, or components that may contain licensed material and has a credible mechanism for licensed material to reach ground water
- Records required by 10 CFR 50.75(g)
- Significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census or sampler station modifications since the last inspection
- Calibration and maintenance records for selected air samplers and environmental sample radiation measurement instrumentation
- Inter-laboratory comparison program results
- Audits, self-assessments, reports, and corrective action documents related to the radiological environmental monitoring program since the last inspection

These activities constitute completion of one sample of radiological environmental monitoring program as defined in Inspection Procedure 71124.07.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

The inspectors evaluated the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors interviewed licensee personnel and reviewed the following items:

- The solid radioactive waste system description, process control program, and the scope of the licensee's audit program
- Control of radioactive waste storage areas including container labeling/marking and monitoring containers for deformation or signs of waste decomposition

- Changes to the liquid and solid waste processing system configuration including a review of waste processing equipment that is not operational or abandoned in place

- Radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides

- Processes for waste classification including use of scaling factors and 10 CFR Part 61 analysis

- Shipment packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifest

- Audits, self-assessments, reports, and corrective action reports radioactive solid waste processing, and radioactive material handling, storage, and transportation performed since the last inspection

These activities constitute completion of one sample of radioactive solid waste processing, and radioactive material handling, storage, and transportation as defined in Inspection Procedure 71124.08.

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 April 1, 2014, through March 31, 2015, the inspectors reviewed licensee event reports, 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)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of April 1, 2014, through March 31, 2015, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for emergency ac power systems Units 1, 2, and 3, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index: High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of April 1, 2014, through March 31, 2015, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for high pressure injection systems Units 1, 2 and 3, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors verified that there were no unplanned exposures or losses of radiological control over locked high radiation areas and very high radiation areas during the period of October 1, 2014, to March 31, 2015. The inspectors reviewed a sample of radiologically controlled area exit transactions showing exposures greater than 100 mrem. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed corrective action program records for liquid or gaseous effluent releases that occurred between October 1, 2014, and March 31, 2015, and were reported to the NRC to verify the performance indicator data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences performance indicator 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, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors verified that the licensee was taking corrective actions to address identified adverse trends.

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

b. Observations and Assessments

The licensee is currently monitoring five station-wide trends in their corrective action program. The inspectors reviewed the corrective action documentation associated with the trending and concluded that the licensee was currently identifying, monitoring, and addressing these trends at a level below regulatory concern. Since the impact of the adverse trends is below a level of regulatory concern they will not be detailed specifically in this inspection report.

The inspectors did not identify any adverse trends of regulatory concern during the previous six months.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected the following two issues for annual follow-up samples.

- On January 10, 2014, during a routine test to check for nitrogen bladder pressure for the Unit 2 charging pump E discharge pulsation dampener, the pressure was approximately 470 psig low. The pulsation dampener was disassembled and it was discovered that the internal bladder was damaged and that the poppet valve and plug assembly were galled. On March 20, 2015, the Unit 2 charging pump B bladder ruptured voiding all three charging pumps.

- On April 9, 2015, the inspectors selected the licensee venting an air void located in the alternate suction piping of the Unit 2 charging pump E as a second issue for an in-depth follow-up.

In each case, 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 remove the air void.

These activities constitute completion of two annual follow-up samples as defined in Inspection Procedure 71152.

b. Findings

Introduction. The inspectors reviewed a self-revealing Green non-cited violation of 10 CFR Part 50 Appendix B, Criterion XVI, for the licensee's failure to take timely corrective actions associated with failure of the discharge pulsation dampener poppet valves in the positive displacement charging pump. Specifically, following the investigation of a degrading discharge dampener bladder on the Unit 2 charging pump E and the discovery that the poppet valve stem was galled and stuck in the poppet valve seat, the licensee did not initiate appropriate corrective actions because they incorrectly concluded that routine monthly monitoring and the 5-year bladder replacement maintenance would identify further failures in the other charging system trains.

Description. During a monthly routine task on January 10, 2014, the licensee identified low pressures on the Unit 2 charging pump E discharge pulsation dampener and the suction stabilizer. They measured the discharge pulsation dampener bladder pressure at 1030 psig (required pressure 1500 psig) and the suction stabilizer bladder at 4.5 psig (required to be 19 psig). The licensee determined that the suction stabilizer bladder was low because of a leak in the nitrogen supply valve packing. Once repaired, the suction stabilizer held the correct nitrogen pressure.

The licensee disassembled the discharge pulsation dampener and discovered nitrile bladder blistering, a galled poppet valve, and the valve was stuck in the poppet valve seat. During normal operation this condition can result in damage to the bladder by allowing it fold over the poppet and weaken and damage the bladder. The licensee also investigated the blistering and found that the bladder material was subject to nitrogen migration through the bladder wall, which is normal. However, a pressure excursion (depressurization of reactor coolant side of the bladder) can result in the expansion of the nitrogen inside the bladder wall and cause blistering. During a Unit 2 forced outage in December 2012, the bladder pre-charge pressures were not lowered prior to plant cooldown, which resulted in the bladders being over pressurized. This operation did not result in the bladder failure, but likely worsened the condition.

The licensee performed an extent-of-condition evaluation for these nitrile bladders and concluded that no declining trends existed in other bladders installed in the plant, and that monthly routine tasks to check the dampener pressure would be adequate to monitor the health of the bladders. Later, these monthly routine tasks would prove insufficient to identify or predict bladder failure.

On March 20, 2015, Unit 2 experienced a complete loss-of-charging event following the sudden failure of charging pump B discharge pulsation dampener that voided all the charging pumps. The licensee's root-cause evaluation for the event discovered that their staff did not fully understand the design of the internal plate valves in the positive displacement pumps. The licensee had incorrectly concluded that internal check valves would prevent gas and fluid from migrating through the pump from the discharge side to the suction side of the pump. The licensee had assumed that this understanding was consistent with the design, but did not verify that assumption. Evaluating the extent-of-condition of this assumed design led the licensee to decide to wait to replace the poppet valves and assemblies until the normal planned 5 year bladder replacement in 2016.

The charging system is quality-related because it is part of the RCS boration flowpath safety function.

Analysis. Failure to take timely corrective actions to replace the charging pump discharge dampener poppet valve assemblies was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it is associated with the equipment performance attribute and directly affected the Initiating Event 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 failure to correct this condition adverse to quality resulted in a reactor coolant system transient and challenged normal plant operations. Using Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," the performance deficiency was determined to be of low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding has an evaluation cross-cutting aspect in the area of problem identification and resolution because the organization did not thoroughly evaluate issues to ensure that resolutions address causes and extent of condition commensurate with their safety significance. Specifically, the licensee took corrective actions in response to the January 2014 poppet galling event based on several assumptions regarding both the degradation mechanism and the internal workings of the sytem components, and used those assumptions to justify not performing additional poppet assembly inspections. However, those assumptions were known to be incorrect by uninvolved technical experts inside the licensee and vendor organization. Had those assumptions been properly vetted and verified by vendor or other industry experts at the time, the extent-of-condition inspections likely would have been accelerated [P.2].

Enforcement. 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, requires, in part, that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances be promptly identified and corrected. Contrary to the above, from January 10, 2014 through March 20, 2015, a condition adverse to quality was not promptly corrected, in that after the licensee became aware of galling of the poppet assemblies associated with the charging pump discharge pressure dampener, the licensee did not take prompt action to address that condition. As a consequence of the licensee not promptly correcting this condition adverse to quality, on March 20, 2015, Unit 2 RCS boration capability was lost entirely when a discharge dampener bladder failed entirely and bound the entire charging pump system with entrained nitrogen. Because this violation is of very low safety significance, and has been entered into the licensee's corrective action program as Condition Report 15 4230, it is being treated identified as a non-cited violation per section 2.3.2.a of the NRC Enforcement Policy. NCV 05000529/2015002-02, "Failure to Take Timely Corrective Actions to Prevent Charging Pump Discharge Bladder Failure."

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

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

.1 (Closed) Licensee Event Report 05000529/2014-002-01, Technical Specification (TS) Required Shutdown Due to a Dropped Control Element Assembly

On November 6, 2014, at approximately 11:16 a.m. Mountain Standard Time, Unit 2 was in Mode 1, full power, when control element assembly 15 dropped fully into the core. Operations entered Technical Specification Limiting Condition of Operation 3.1.5, Condition A, for one control element assembly misaligned from its group which requires a power reduction and restoration of control element assembly alignment. An initial power reduction was performed and attempts to repair the problem were initiated. Attempts to realign the control element assembly within the 2 hour technical specification time limit were unsuccessful. Technical Specification Limiting Condition for Operation 3.1.5, Condition C was entered at 1:16 p.m. which required entry into Mode 3 within 6 hours. The power reduction was continued and the reactor was manually shutdown at 4:36 p.m. to comply with technical specifications.

The licensee determined that the upper gripper coil on the control element drive mechanism failed for control element assembly 15. The inspectors' review of the root cause evaluation determined the dropped control element assembly was caused by thermally accelerated degradation of the upper gripper coil insulation. Specifically, the station set the gripper holding voltage to a target of 42 Vdc which resulted in subjecting the upper gripper coils to operating temperatures of greater than 400°F. Operation at temperatures above 400°F has the effect of accelerating coil insulation degradation. The vendor was unable to provide the licensee with operating temperature or electrical current limits for the upper gripper coils. The vendor only recommended that the coil voltages be set to 40 +/- 5 Vdc. The root cause evaluation specified corrective actions to prevent recurrence of adjusting all gripper holding voltages to 36 +/- 1 Vdc in order to obtain coil operating temperatures less than 400°F. Vendor technical documents support that adjusting the coil holding voltage provides the most significant impact on coil temperatures. Additionally, the licensee has implemented a quarterly planned maintenance item to monitor coil temperatures via voltage and current measurements. The inspectors reviewed the licensee event report and did not identify any additional concerns. This licensee event report is closed.

.2 (Closed) Licensee Event Report 05000529/2015-001-00, Condition Prohibited by Technical Specification Limiting Condition for Operation 3.3.5, Engineered Safety Features Actuation System

a. Event Summary

On January 11, 2015, at 12:24 a.m., Unit 2 received a plant monitoring system (RJ) alarm on point SASB22, indicating the setpoint for the bistable relay comparing differential pressures between steam generators was approaching the technical specification allowable limit for steam generator pressure difference-high. Point SASB22 does not alarm to control room annunciators (RK) and, therefore, went unnoticed until late in the shift. Operators verified the annunciator for steam generator differential pressure was not alarming and the steam generator pressures were normal. The significance of the RJ alarm was not apparent to operators because the value was displayed in units of voltage instead of differential pressure.

On January 24, 2015, further questioning determined the setpoint for the bistable that monitors differential pressure between steam generators had exceeded its allowable

value. The steam generator B pressure difference-high channel was declared inoperable and steam generator level 2-low was placed in bypass per Limiting Conditon for Operation 3.3.5, Condition A.

The direct cause of the event was setpoint drift of the SASB22 bistable relay caused by potentiometers that had not been recently wiped clean. The root cause was the lack of an annunciated alarm for SASB22 and associated alarm response procedure to ensure the alarm condition was promptly acknowledged, understood, and correctly addressed within technical specification time limits. A significant contributing cause to the condition prohibited by technical specifications was that the operating crew that first identified the alarm on January 11, 2015, did not initiate a condition report. The inspectors reviewed the licensee event report and dispositioned this issue as a self-revealing violation, the enforcement aspects of which are discussed below. This licensee event report is closed.

b. Findings

Introduction. The inspectors reviewed a Green self-revealing non-cited violation of Technical Specification 3.3.5 condition A.1 for failure to place a failed steam generator differential pressure in bypass or trip. Specifically, on January 11, 2015, after Unit 2 received a steam generator pressure difference setpoint alarm on channel B, operators failed to determine the cause of the alarm. As a result, the auxiliary feedwater actuation signal channel was inoperable for a period of 13 days, which was longer than the technical-specification allowed outage time of one hour, during which time the failed channel would provide a false negative under valid actuation setpoint conditions.

Description. On January 11, 2015, at 12:24 a.m., the Unit 2 control room received a plant monitoring system (RJ) alarm on point SASB22, which appears on a plant monitoring system screen as “steam generator 2 less than steam generator 1 pressure setpoint channel B.” The corresponding parameter is used by the engineered safety features actuation system to monitor for a faulted steam generator; if the difference in pressure between the two steam generators exceeds 185 psid, then the engineered safety features actuation system assumes that the steam generator with the lower pressure is faulted (either a steam or feedwater line break). The auxiliary feedwater actuation system will then be prevented from feeding the faulted generator. Technical Specification 3.3.5 allows an upper limit of 192 psid for this setpoint.

Although the alarm appeared on the plant monitoring system at 12:24 a.m., operators first noticed the alarm several hours later when the appropriate display screen on the plant monitoring system was selected. Procedure 40AL-9RJ01, "Plant Monitoring System (RJ) Alarm Responses," did not have instructions on how to address this alarm, and the alarm displayed in volts and not psid. Operators checked both steam generator pressures for abnormalities and found none, so the operators took no further action. Operators in shifts between January 11 and January 24 did not notice this alarm because it appeared only on a particular screen on the plant monitoring system, and because selecting and reviewing that screen was not a standard activity for any member of the operating crew at the time.

On January 24, 2015, operators selected the screen on the plant monitoring system which displays various alarms, and noted this alarm. In response, the operators initiated Palo Verde Action Request 4617612 to address this alarm. That action request led the

licensee to check the setpoint on the plant protection system cabinet, where they found that the setpoint voltage was reading 1.404 volts. This voltage reading corresponds to a differential pressure setpoint of 213 psid, which is above the setpoint of 192 psid allowed by technical specifications. Upon discovering this, the crew declared the channel B auxiliary feedwater actuation signal steam generator 2 inoperable and entered Technical Specification 3.3.5, Condition A. Further troubleshooting revealed that the setpoint drift was the result of a dirty potentiometer. The licensee corrected this condition and declared the channel B auxiliary feedwater actuation signal steam generator 2 operable on January 28, 2015.

The licensee performed a root-cause evaluation under Condition Report Disposition Request 4618033 which determined that the cause of the event was inadequate procedural guidance in the alarm response procedure to address this condition. Furthermore, the evaluation found 74 other plant-monitoring system alarms tied to plant protection system setpoints that did not have appropriate alarm response procedural guidance to diagnose and address the alarm condition. The licensee's root cause evaluation also identified an important contributing cause that the January 11 crew did not initiate a condition report for an alarming condition they did not fully understand. The inspectors reviewed the results of the evaluation and came to similar conclusions.

The inspectors' review of the equipment history revealed that the licensee had completed their most-recent alarm response procedure revision on April 16, 2014, as part of an affected-procedures review to support a modification to the plant computer system under design modification work order 3270069. That modification replaced the obsolete legacy plant computer system with new hardware and software. As part of this modification, the licensee planned for alarm procedure 40AL-RJ01 to be incorporated into existing alarm procedure 40AL-9RK4A. When the licensee implement the Unit 2 plant computer system modification during the Spring 2014 refueling outage, they cancelled procedure 40AL-RJ01. However, licensee staff performing these procedural revisions as part of the design modification process failed to identify that the level of guidance needed for the operators to respond to alarming conditions was not provided by either the old or new revision to the procedure.

Analysis. The failure to provide adequate alarm procedures was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it affected the equipment performance attribute of the Mitigating Systems Cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the control room operators did not have an alarm response procedure for plant monitoring system (RJ) alarm on point SASB22, which resulted in the channel B auxiliary feedwater actuation signal steam generator 2 drifting out of tolerance for a period of 13 days. This exceeded the allowed outage time specified in the technical specifications. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The finding screened to a detailed risk evaluation because it involved the actual loss of function of at least a single train for greater than its technical specification allowed outage time. A Region IV senior reactor analyst performed a detailed risk evaluation and determined that the change in core damage frequency $\Delta CDF < 5E-9$ corresponds to very low (Green) safety significance. This finding has a cross-cutting aspect in the area of human performance associated with the change management component in that the licensee did not use a systematic process for evaluating and implementing change so that nuclear safety remains the

overriding priority. Specifically, the licensee did not use a systematic process to identify and correct the lack of alarm procedures associated with this parameter along with 74 other alarms that have technical specification implications during the design modification process for the plant computer alarm system [H.3].

Enforcement. Technical Specification 3.3.5 Condition A.1 requires, in part, that operators place a failed ESFAS channel in trip or bypass within 1 hour. Contrary to the above, from January 11, 2015 to January 24, 2015, Palo Verde Unit 2 operated with the Channel B actuation setpoint for the Steam Generator #2 Differential Pressure Isolation having drifted out of tolerance but remaining in service. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report Disposition Request 4618033, this violation is being treated as a non-cited violation in accordance with Section 2.3.2.a of the Enforcement Policy: NCV 05000529/2015002-03, "Failure to Identify and Correct Engineered Safety Features Actuation System Steam Generator Differential Pressure Setpoint Drift."

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

On May 27, 2015, the licensee removed Unit 3 high pressure safety injection train A for planned maintenance. The following morning, during the maintenance, the licensee noted lube oil contamination, and determined that an outboard motor bearing had apparently failed during the last run following maintenance during the last refueling outage which involved disassembling and reassembling the bearing. The licensee identified procedural guidance inadequacies in the reassembly procedure that were the likely cause of the failure. The licensee could not perform required repairs in a controlled manner within the remaining action statement completion time, so on May 29, 2015, the licensee requested a Notice of Enforcement Discretion for a one-time action-statement extension of 24 hours to allow time to reassemble and test the replacement bearings prior to restoring operability. The NRC granted that request as NOED 15-4-01. The licensee completed maintenance, testing, and restoration approximately 11 hours into the 24-hour extension window. In accordance with Inspection Manual Chapter 0410, Unresolved Item (URI) 05000530/2015002-04 is opened for NOED 15-4-01, and remains open pending further inspection and disposition in a future inspection report.

.4 Unit 2 Complete Loss of Charging

a. Inspection Scope

On March 20, 2015, Unit 2 experienced a complete loss of charging and letdown due to the charging pump B discharge pulsation dampener failure which voided the suction of the charging system. Pressurizer level lowered below 25 percent and pressurizer heaters automatically secured. Operators were able to restore a charging pump approximately 2 hours and 42 minutes after the initial loss of charging began. Full charging and letdown was restored on March 23, 2015. The resident inspectors responded to the control room, observed operator response, and performed a complete walkdown. The focused baseline inspection team reviewed the root cause, interviewed site personnel, and verified that the licensee met the reporting requirements specified in NUREG-122, "Event Reporting Guidelines," Revision 3.

b. Findings

Introduction. The inspectors reviewed a self-revealing Green, non-cited violation of Technical Specification 5.4.1.a, through Regulatory Guide 1.33, Revision 2, Appendix A, Section 6.t, February 1978 for the licensee's failure to establish adequate procedures for combating emergencies and other significant events regarding a total loss of charging pumps due to gas binding that affected reactor coolant system pressure and level control. On March 20, 2015, after Unit 2 experienced a total loss of charging, operators relied on a normal operating procedure which did not address how to combat a total loss of charging flow due of gas binding from a failed discharge pulsation dampener.

Description. On March 20, 2015, the Unit 2 control room received alarms associated with reactor coolant pump seal injection and charging header system. During the follow up actions, operations personnel encountered an unexpected failure of the charging pump B discharge pulsation dampener bladder. This failure resulted in high-pressure gas expanding into the common suction header of the charging pumps and causing gas binding of the charging pumps. Consequently, without the charging pumps available, letdown was automatically isolated on high temperature due to the lack of charging flow through the regenerative heat exchanger. Through interviews and statements provided by operations personnel, inspectors confirmed that the abnormal operating procedure was intended for loss of letdown and did not provide appropriate guidance for a loss of charging flow due to a discharge pulsation dampener failure induced gas binding of all charging pumps.

The inspectors reviewed abnormal operating Procedure 40AO-9ZZ05, "Loss of Letdown," Revision 25, operating Procedure 40OP-9CH01, "CVCS Normal Operations," Revision 75, and training documentation for operations personnel. Through these reviews, the inspectors identified that all references in the established procedures did not address a gas intrusion from a source other than volume control tank or suction line dampeners. In further review of training documentation for initial operator licensing and licensed operator requalification training, the inspectors determined that training provided to operations personnel did not include adequate guidance on how to respond to the total gas binding of the common suction header. The licensee also determined the procedure deficiency as a result of the root-cause evaluation documented in Condition Report 15-1314.

The inspectors noted that until December, 1997, the licensee had an abnormal operating procedure to deal with a loss of all charging and was conducting reactor operator requalification training on that procedure. In a licensee initiative to review abnormal operating procedures, the licensee decided to move guidance for a loss of charging event to a normal operating procedure. Because the licensee had retired the abnormal operating procedure, they had also stopped training licensed operators on combating a loss-of-charging event. The inspectors considered that decision in December 1997 to be the primary cause of this performance deficiency.

Analysis. The failure to provide adequate procedures for combating emergencies and other significant events including a total loss of charging pumps due to gas binding was a performance deficiency. The performance deficiency was more-than-minor and is a finding because it is associated with the procedure quality attribute and directly affected the Initiating Event 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 lack of adequate procedural guidance challenged reactor operators during the loss of charging event. In accordance with Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," the inspectors determined the performance deficiency to be of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance because the decision to eliminate the abnormal operating procedure and not to train reactor operators was made in 1997.

Enforcement. Technical Specification 5.4.1.a, states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 6 of that appendix requires procedures for combating emergencies and other significant events, including malfunction of the pressure control system.

Contrary to the above, between December 1997 and March 2015, the licensee did not maintain written procedures for combating a certain significant event which could result in malfunction of the pressure control system. Specifically, the licensee did not maintain written procedures to properly respond to a rupture of a charging pump discharge pulsation dampener bladder causing a complete loss of charging flow. In response to this issue, the licensee developed guidance within the abnormal procedure to ensure critical safety functions are maintained following a reactor trip without charging flow available.

Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Condition Report 15-4230, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000529/2015002-05, "Failure to Establish Adequate Procedures to Respond to a Total Loss of Charging Event."

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 6, 2015, the inspectors presented the radiation safety inspection results to Mr. D. Mims, Senior Vice President, Regulatory Affairs and Oversight, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On April 17, 2015, the inspectors presented the inspection results to Mr. D. Mims, Senior Vice President, Regulatory Affairs and Oversight, and other members of the licensee staff. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed

On June 12, 2015, the inspectors presented the radiation safety inspection results to Mr. D. Mims, Senior Vice President, Regulatory Affairs and Oversight, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On July 1, 2015, the inspectors presented the inspection results to Ms. M. Lacal, Vice President, Nuclear Regulatory and Oversight, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On July 8, 2015, the inspectors presented the inspection results to Mr. J. Cadogan, Vice President, Nuclear Engineering, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On August 11, 2014, the inspectors presented the inspection results to Ms. M. Lacal, Vice President of Nuclear and Regulatory Oversight, and other members of the licensee staff. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

N. Aarons-Cooke, Nuclear Regulatory Affairs, Engineer
G. Andrews, Nuclear Regulatory Affairs, Director
J. Aronson, Section Leader, Operations Standards
W. Blaxton, Senior Technician, Radiation Protection
D. Brace, Section Leader, Engineering
M. Brannin, Engineering Inspections, Engineer
G. Brown, Manager, Operations Support
P. Bury, Director, Nuclear Training
J. Cadogan, Nuclear Engineering, Vice President
R. Cauley, Senior Technician, Chemistry
P. Coleman, Technician, Radiation Protection
M. Comolli, Health Physicist, Radiation Protection
J. Cox, Engineering Inspections, Program Owner
T. Dickinson, Unit 3 RMC Supervisor, Radiation Protection
M. DiLorenzo, Engineering Inspections, Department Lead
S. Dornseif, Nuclear Regulatory Affairs, Compliance Consultant
D. Elkinton, Senior Consultant, Regulatory Affairs
M. Lacal, Vice President, Nuclear Regulatory and Oversight
E. Fernandez, Engineering Inspections, Engineer
R. Folley, Engineering Inspections, Engineer
J. Glass, Department Leader, Performance Improvement
K. Graham, Assistant Plant Manager
T. Gray, Superintendent, Radiation Protection Technical Support
D. Hansen, Engineering, Engineer Level III
D. Heckman, Senior Compliance Consultant, Regulatory Affairs
G. Jones, Supervisor, Radiation Protection
C. Kharrl, General Plant Manager
S. Kniesteadt, Engineer II
S. Lantz, Dosimetry Section Leader, Radiation Protection
D. Majors, Operations, Operations Manager
D. McFelia, Senior Technician, Radiation Protection
M. McGhee, Department Leader, Nuclear Regulatory Affairs
M. McLaughlin, Manager, Nuclear Regulatory Affairs (Acting)
E. Medlin, Supervisor, Radiation Protection Waste Processing & Transportation
D. Mims, Regulatory Affairs and Oversight, Senior Vice President
C. Moeller, Director, Technical Support (Acting)
R. O'Neal, Senior Technician, Radiation Protection
M. Radspinner, Department Leader, Plant Engineering
T. Romay, Shift Manager
R. Routollo, Manager, Radiation Protection (Acting)
K. Shrecker, Project Engineering, Department Lead
T. Weber, Department Leader, Regulatory Affairs
D. Wheeler, Director, Performance Improvement

NRC Personnel

M. Watford, NRR Project Manager for Palo Verde

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000530/2015002-04	URI	Notice of Enforcement Discretion of Technical Specification 3.5.3 Emergency Core Cooling System – Operating Conditions B and C (Section 4OA3.3)

Opened and Closed

05000528/2015002-01	NCV	Failure to Verify the Design of the Essential Spray Pond System Crosstie Valves (Section 1R15)
05000529/2015002-02	FIN	Failure to Take Timely Corrective Actions to Prevent Charging Pump Discharge Bladder Failure (Section 4OA2.3)
05000529/2015002-03	NCV	Failure to Identify and Correct Engineered Safety Features Actuation System Steam Generator Differential Pressure Setpoint Drift (Section 4OA3.2)
05000529/2015002-05	NCV	Failure to Establish Adequate Procedures to Respond to a Total Loss of Charging Event (Section 4OA3.4)

Closed

05000529/2014-002-01	LER	Technical Specification (TS) Required Shutdown Due to a Dropped Control Element Assembly (Section 4OA3.1)
05000529/2015-001-00	LER	Condition Prohibited by Technical Specification Limiting Condition for Operation 3.3.5, Engineered Safety Features Actuation System (Section 4OA3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
51DP-9OM03	Site Scheduling	31
40OP-9ZZ19	Hot Weather Protection	6
40EP-9EP07	Loss of Offsite Power/ Loss of Forced Circulation	26

Condition Reports

4637608

Section 1R04: Equipment Alignment

Procedures

Number	Title	Revision
40ST-9SI13	LPSI and CS System Alignment Verification	31
40ST-9SI07	High Pressure Safety Injection System Alignment Verification	17
73ST-9SI10	HPSI Pumps Miniflow-Inservice Test	50
73ST-9SI02	Containment Spray Nozzle Air Test	8
40OP-9SI01	Shutdown Cooling Initiation	55
40ST-9SI07	High Pressure Safety Injection System Alignment Verification	17

Miscellaneous Documents

Number	Title	Revision/ Date
02-M-SIP-003	P&I Diagram Safety Injection & Shutdown Cooling System	11
13-P-ZCG-117	Containment Building Safety Injection System Containment Spray Nozzle Details	4
13-P-ZCG-114	Containment Building Safety Injection System Containment Spray Nozzle Plans & Details	July 20,1994
01-P-SIF-203	Auxiliary Building Isometric Safety Injection System HPSI Pump Discharge Train A & RWT	8
03-M-SIP-001	P&I Diagram Safety Injection & Shutdown Cooling System	46
03-M-SIP-002	P&I Diagram Safety Injection and Shutdown Cooling System	36
	Palo Verde Nuclear Generating Station UFSAR	17
05000528/2007012 05000529/2007012 05000530/2007012	Palo Verde Nuclear Generating Station – NRC Supplemental 95003 Inspection Report	February 1, 2008

Palo Verde Action Requests

3072361	3072362	3545651	3547810	3547811	3551000
3562378	4644973	4666481			

Work Orders

3491592	3491593	3167372

Section 1R05: Fire Protection

Procedures

Number	Title	Revision
14DP-0FP01	Firewatch	12
14DP-0FP02	Fire System Impairments and Notifications	20
	PVNGS Pre-Fire Strategies Manual	25

Miscellaneous

Title	Revision/Date
PVNGS Technical Specifications	189
Post 21 Control Unit 2 Tamper/Vital/Security Tour and Fire Watch Tour Logs	May 4, 2015
Post 21 Control Unit 2 Tamper/Vital/Security Tour and Fire Watch Tour Logs	May 7, 2015
PVNGS Updated Final Safety Analysis Report	17A

Palo Verde Action Requests

4626090	4627404	4637822	4647115	4651391
4657248	4657373			

Section 1R06: Flood Protection Measures

Calculations

Number	Title	Revision
13-MC-ZA-0809	Auxiliary Building Flooding Calculation	7

Palo Verde Action Requests

3045959	3045963	3071211	3221181	3466866

Work Orders

3264309	2914966

Section 1R08: Inservice Inspection Activities

Procedures

Number	Title	Revision
MN725-A02017	Rolled Mechanical Tube Plugging and Stabilizer Installation Palo Verde Nuclear Generating Station	0
70TI-9ZC01	Boric Acid Walkdown Leak Detection	17
73DP-9ZC01	Boric Acid Corrosion Control Program	7

Procedures

Number	Title	Revision
73TI-9RC01	Steam Generator Eddy Current Examinations	29
81DP-9RC01	PVNGS Steam Generator Management Program	14
73WP-0ZZ20	Visual Inspection of Code Welds	9
73WP-0ZZ05	Welding of Ferritic and Martensitic Steels	14
73WP-0ZZ04	Welding of Carbon and Low Alloy Steels to Stainless and Nickel Alloys	17
73TI-9ZZ17	Visual Examination of Welds, Bolting, and Components	12
73DP-9WP04	Welding and Brazing Control	17
73DP-9WP01	Welder and Procedure Qualification	6
73TI-9ZZ07	Liquid Penetrant Examination	15
73TI-9ZZ09	Ultrasonic Examination of Pipe and Vessel Welds	17
MN756-A00002	PDI-UT-2 Generic EPRI Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	F
73TI9RC09	Bare Metal Visual Examination of Reactor Vessel Upper Head	3

Non-destructive Examination Reports

15-UTE-3112	15-UTE-3111	15-UTE-3105	15-PT-3127	15-PT-3128
15-PT-3126	15-MT-3101	15-VE-3011	15-VE-3010	15-VE-3038
15-VE-3037	15-VE-3012	13-VT-3146	13-VT-3150	13-VT-3151
13-VT-3152	13-VT-3153	13-VT-3154	13-VT-3155	13-VT-3156
13-VT-3157	13-VT-3147	13-VT-3148	13-VT-3149	

Miscellaneous

Number	Title	Revision
SG-SMP-15-3-NP	Palo Verde U3R18 Steam Generator Degradation Assessment	0
03-M-RCP-002	P&ID Diagram Reactor Coolant System	12
03-M-RCP-001	P&ID Diagram Reactor Coolant System	33
B1-OMNI	Acquisition Technique Sheet for Bobbin Coil Examinations	12
R2-OMNI	Acquisition Technique sheet for RC Examinations of Steam Generator Tubing	14

Miscellaneous

Number	Title	Revision
03-MS-A129	Steam Generator Operational Assessment Evaluation Unit 3 Cycles 17 and 18	1

Condition Report Disposition Requests

4379057	4466714	4488021	4488023	4488025
4501172	4512460	4542634	4544653	4545627
4553363	4558000			

Condition Report Action Items

4111890	4466174	4488022	4495845	4574135
4543865	4543871	4543877	4543882	4543888
4545628	4549021	4551907	4557894	4573464
4639443	4639457			

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

Palo Verde Action Requests

4645242	4651639

Procedures

Number	Title	Revision
40OP-9DP02	Conduct of Shift Operations	67
40OP-9ZZ05	Power Operations	141
40OP-9ZZ07	Plant Shutdown from Mode 1 to Mode 3	38

Miscellaneous

Title	Description	Date
Unit 2 Standing Orders	PVNGS Loss of All Charging and Letdown Strategy	April 2, 2015
Simulator Testing Report	Loss of All Charging Event	April 21, 2015

Section 1R12: Maintenance Effectiveness

Palo Verde Action Requests

4641138 4643414

Condition Report Action Items

4493641

Work Orders

Number	Description	Date
04445796	Surveillance Test Package-In-service Pump Test-Unit 2	January 8, 2015
04413610	Surveillance Test Package-In-service Pump Test-Unit 2	October 9, 2014

Procedures

Number	Title	Revision
40OP-9CH13	Charging Pump Suction Stabilizer and Discharge Pulsation Dampener Operation	24
73ST-9CH06	In-service Test of Charging Pumps	30
73DP-0EE17	Gas Accumulation Management	2

Miscellaneous Documents

Title	Description	Revision/Date
Palo Verde Maintenance Rule Intranet Database		
Unit 1 Maintenance Rule SSC Unavailability (UA) Report		March 31, 2015
Unit 2 Maintenance Rule SSC Unavailability (UA) Report		March 31, 2015
Unit 3 Maintenance Rule SSC Unavailability (UA) Report		March 31, 2015
Component Data Sheet		March 26, 2015
Maintenance Rule (a)(1) Issue Tracking Form: Issue Number 1283		0
Maintenance Rule Manager Report	Events- Unavailability for System CH-CVCS, Charging Pumps	May 7, 2015
Performance Criteria Formulation Basis	System CH, Chemical and Volume Control System	6
02-P-CHF-206 /207	Auxiliary Building Isometric CVCS	5

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
70DP-0RA01	Shutdown Risk Assessments	47
73ST-9XI20	ADVs – Inservice Test	39
02DP-0RS01	Online Integrated Risk	4
40EP-9EO11	Lower Mode Functional Recovery	29
40AO-9ZZ23	Loss of SFP Level or Cooling	26
51DP-9OM03	Site Scheduling	31
51DP-9OM03-02	Emergent Work and Scope Expansion Decision Guideline	1
70DP-0RA05	Assessment and Management of Risk when Performing Maintenance in Modes 1 and 2	22
40DP-9RS01	Operations Department Onine Nuclear Risk Management Mode 1 and 2	3
51DP-9OM09	Outage Planning and Implementation	16
51DP-9OM07	Forced Outage Management	8

Condition Reports

3779766	3809244	3809499	3835985	3837598
3837601	3837611	4569575	4641870	4651095
4652546	4653898	4657572		

Miscellaneous Documents

Title	Date
3R18 Outage Control Center Turnover	April 9, 2015
Shutdown Safety Function Assessment: Reactor Vessel Head Off, RCS Above RV Range	October 2, 2014
Status View Report	April 9, 2015
Scheduler's Evaluation for PV Unit 2	June 7, 2015
Scheduler's Evaluation for PV Unit 3	May 5, 2015
Scheduler's Evaluation for PV Unit 3 (revised)	May 28, 2015
Shutdown Safety Function Assessment: Pressurizer Manway On, SDC Entry Conditions Met	April 30, 2015
Shutdown Safety Function Assessment: Pressurizer Manway On, SDC Entry Conditions Met (Stop Seal)	April 30, 2015
Unit Three 18th Refueling Outage Shutdown Risk Assessment Final Report	March 26, 2015
Operator's Risk Report, Unit 2	May 13, 2015

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision
40EP-9EO03	Loss of Coolant Accident	33
40EP-9EO09	Functional Recovery	50
40ST-9ZZ10	Post Accident Monitoring Instrumentation Channel Checks	30
40DP-9OP26	Operations PVAR Processing and Operability Determination/Functional Assessment	40

Condition Reports

97Q626	3127427	4274171	4460518	4481511
4593834	4594327	4605840	4611921	4612553
4633058	4634161	4641870	4644844	4644973
4651046	4664791	4668075		

Palo Verde Action Requests

4635822	4644316

Engineering Work Orders

4654870

Miscellaneous Documents

Number	Title	Revision/Date
	CEDMCS Recent Timeline – Major Events	
	ODMI: CEDM upper gripper coil voltage and current data collection in support of SIG CRDR 4594327	
	Root Cause Evaluation Report: Unit 2 CEA 15 drop leads to manual reactor shutdown	2
DEC-00436	Increase CEDMCS Cabinet Logic Supply Voltage	
CN-SEE-I-14-11	APS CVCS Suction Acceptance	0
ENG WO 4636087	Engineering Evaluation Functional Acceptance Gas Void in CVCS	March 23, 2015

Section 1R18: Plant Modifications

Procedures

Number	Title	Revision
40EP-9EO03	Loss of Coolant Accident	33
40AL-9RJ01	PMS (RJ) Alarm Responses	5
40DP-9OP02	Conduct of Shift Operations	66
40DP-9OP05	Control Room Data Sheet Instructions	71

Condition Reports

4612033	4617612	4621024	4631493	465333

Miscellaneous Documents

Number	Title	Revision
E-12-0002	10 CFR 50.59 Screening / Evaluation for DMWO 3304346	0
4618033	Root Cause Evaluation Report: Unit 2 SG Pressure Differential High Alarm Missed	2
3270069	Design Input Requirements Checklist	0
2009-00780	Engineering Document Change	

Section 1R19: Post-Maintenance Testing

Procedures

Number	Title	Revision
02DP-0RS01	Online Integrated Risk	4
73ST-9XI20	ADVs – Inservice Test	39
73ST-9SI11	Low Pressure Safety Injection Pumps Miniflow – Inservice Test	34
73ST-9XI04	SI Train B Valves – Inservice Test	34
40DP-9OP19	Locked Valve, Breaker, and Component Tracking	126
31MT-9CH01	Charging Pump Disassembly and Reassembly	34

Condition Reports

4481420	4482304	4645636	4651095	4652240
4652546	4657568	4657572	4657965	

Work Orders

4490386	4494284	4504501	4504502	4521656
4653151	4657768	4657967		

Maintenance Orders

Number	Title
0277093	Change out Pulsation Dampener Bladder
2667829	Adjustment of Pulsation Dampener Pressure

Miscellaneous Documents

Number	Title	Revision/ Date
	Scheduler's Evaluation for PV Unit 3	May 5, 2015
	Component Data Sheet: SIT 2A Fill & Drain Valve	April 23, 2015
03-M-SIP-001	P&I Diagram Safety Injection & Shutdown Cooling System	45
03-M-SIP-002	P&I Diagram Safety Injection and Shutdown Cooling System	35
02-E-PKB-005	Elementary Diagram 125V Clas 1E Power Systems Main Battery Breakers and Intenal Mechanisms	1

Section 1R20: Refueling and Other Outage Activities

Procedures

Number	Title	Revision
73DP-9ZC01	Boric Acid Corrosion Control Program	7
70TI-9ZC01	Boric Acid Walkdown Leak Detection	17
40OP-9ZZ02	Initial Reactor Startup Following Refuelings	57
40OP-9ZZ04	Plant Startup Mode 2 to Mode 1	73
40OP-0ZZ01	Cold Shutdown to Hot Standby Mode 5 to Mode 3	44
01DP-0AP17	Managing Personnel Fatigue	9

Palo Verde Action Requests

4649417	4640527	4640528	4640529	4640530
4640531				

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
73ST-9CL02	Integrated Leakage Rate Test	11
73DP-9XI01	Pump and Valve Inservice Testing Program	30
73DP-9ZZ12	Motor Operated Valve (MOV) Program	9
73ST-9XI04	SI Train B Valves – Inservice Test	34
73ST-9EC01	Essential Chilled Water Pumps – Inservice Test	27
73ST-9DF03	Diesel Fuel Oil Transfer Pumps – Inservice Test	30

Palo Verde Action Requests

4643590	4648912	4648946	4649259

Work Orders

4495938	4445050	4467086	4503915	4521656	4649023

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

Number	Title	Revision
33ST-9HF01	Surveillance Testing for the Aux/Fuel Building Nuclear Air Treatment System	21
33ST-9HF03	Carbon Analysis for the Aux/Fuel Building Nuclear Air Treatment System	9
74RM-9EF20	Gaseous Radioactive Release Permits and Offsite Dose Assessment	16
74RM-9EF60	RMS Sample Collection	31
74RM-9EF63	RU-143 Sample Operations	1
74RM-9EF65	RU-145 Sample Operations	0
74ST-9SQ16	RU-145 and RU-146 Quarterly Functional Test Procedure	10

Audits and Self-Assessments

Number	Title	Date
2014-007	Audit Plan and Report: Radiation Protection	October 3, 2014

Palo Verde Action Requests and Condition Reports Disposition Reports

2743517	4385463	4429980	4451934	4472441

4504479 4629997 4641805

Radioactive Effluent Release Permits

Number	Title	Revision
20153090	Release Point: Other	0
20153093	Release Point: Plant Vent	1
20153094	Release Point: Boric Acid Concentrator	0
20153096	Release Point: Plant Vent	0

In-Place Filter Testing and Carbon Testing Records

Number	Title	Date
4407507	Carbon Testing – 2MHFBJ01	October 2, 2014
4413700	Carbon Testing – 1MHFAJ01	October 25, 2014
4444961	In-Place Filter Testing – 2MHFBJ01	December 17, 2014
4455567	In-Place Filter Testing – 1MHFAJ01	February 5, 2015
4467235	In-Place Filter Testing – 3MHFAJ01	March 5, 2015
4467236	Carbon Testing – 3MHFBJ01	April 2, 2015

Sampling Documentation

Number	Title	Date
1-13-0016	Compensatory Action Document (CAD) (Sample)	April 4, 2013
1-14-0008	Compensatory Action Document (CAD) (Sample)	January 7, 2014
1-14-0040	Compensatory Action Document (CAD) (Sample)	October 23, 2014
2015-1-066	Effluent Sample Data Sheet	June 10, 2015
2015-1-068	Effluent Sample Data Sheet	June 10, 2015
2015-2-071	Effluent Sample Data Sheet	June 11, 2015

Miscellaneous Documents

Number	Title	Revision/Date
	Offsite Dose Calculation Manual	26
	Radiation Monitor Operability Log (between 01/01/2013 and 05/26/2015)	May 26, 2015
Q1-2015	System Health Report: SQ – Radiation Monitoring	
2013	Annual Radioactive Effluent Release Report	April 24, 2014

Miscellaneous Documents

Number	Title	Revision/Date
2014	Annual Radioactive Effluent Release Report	April 25, 2015
218-03792	Decommissioning Records Review and 10 CFR50.75(g)(1) Applicability Review for 2013	November 26, 2014
218-03856	4th Quarter 2014 Decommissioning Record	May 21, 2015
74ST-9SQ04	Effluent Monitoring System Monthly Source Check	June 9, 2015
74ST-9SQ16	RU-145 and RU-146 Quarterly Functional Test	June 10, 2015

Section 2RS7: Radiological Environmental Monitoring Program

Procedures

Number	Title	Revision
PR-0103	Environmental Monitoring	0
74RM-0EN02	Radiological Environmental Air Sampling	20
74RM-0EN03	Radiological Environmental Sampling	31
74RM-0EN05	Environmental TLD Exchange/Reporting	15
74RM-0EN07	Land Use Census	14
77ST-9RG03	Meteorological System Calibration (Primary System)	13
77ST-9RG02	Meteorological System Calibration (Redundant System)	10

Audits and Self-Assessments

Number	Title	Date
NAD Audit 2014-007	Nuclear Assurance Department Audit Plan and Report	October 3, 2014

Palo Verde Action Requests and Condition Reports Disposition Reports

4358449	4385463	4403302	4435231	4543476
4568151	4567692	4604440	4630452	

Miscellaneous Documents

Title	Revision/Date
Offsite Dose Calculation Manual	26
Radiological Environmental Operating Report 2013	April 10, 2014
Radiological Environmental Operating Report 2014	April 15, 2015
REMP Air Sampling Siting Criteria	January 17, 2013

Section 2RS8: Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation

Procedures

Number	Title	Revision
37DP-9ZZ11	Excavation, Placement, and Backfill	4
75DP-0RP04	Radiological Reports	9
75RP-9RP15	Control and Storage of Radioactive Material and Radioactive Wastes	25
76DP-0RP01	Radwaste Management Program Overview	7
76DP-0RP03	Radwaste Process Control Program	8
76DP-0RP04	Receipt and Shipment of Radioactive Material	5
76RP-0RW03	Waste Stream Sampling and Database Maintenance	1
76RP-0RW04	Receipt of Radioactive Material	5
76RP-0RW05	Packaging and Classification of Radioactive Waste	4
76RP-0RW06	Packaging of Radioactive Material	3
76RP-0RW07	Shipping Radioactive Material	13
76RP-0RW08	High Integrity Container Receipt, Handling, Use, and Closure	4
76RP-0RW09	Transfer, Storage, and Processing of Radioactive Filters	7
76RP-0RW10	Handling and Storage of Radioactively Contaminated Chemical Waste and Mixed Waste	3
76RP-0RW79	Operation of the APS CD-600 System Serial Number 4969	8
76RP-0RW82	Self-Engaging Rapid Dewatering System (SERDS) Operation	2
76RP-0RW89	Operation of the APS CD-600 System Serial Number 5973	0
WROP-8ZZ04	WRF Landfill Operation Procedure	18

Audits and Self-Assessments

Number	Title	Date
2014-007	Nuclear Assurance Department (NAD) Audit Plan and Report – Radiation Protection	October 3, 2014
NUPIC Audit #23463	3rd Party Audit of WMG Incorporated	August 8, 2013
NUPIC Audit #23201	3rd Party Audit of Energy Solutions	October 26, 2012

Palo Verde Action Requests and Condition Reports Disposition Reports

4324891	4385231	4408641	4414774	4420758
4443291	4436468	4438338	4449413	4459734
4468850	4491601	4555199	4558066	4569966
4570013	4587302	4591746	4663056	4644185
4648302	4664403			

Radioactive Material Shipments

Number	Title	Date
15-RW-023	Dewatered Bead Resin 14D-2 Cask	June11, 2015
15-RW-022	Dewatered Bead Resin 14-210H Cask	June 9, 2015
15-RE-055	New Fuel Canisters	June 10, 2015
15 RW-007	20’ SeaLand/Intermodal Containers of Soil	March 19, 2015
14-RW-018	Dewatered Bead Resin 14D-2 Cask	May 14, 2014
14-RW-006	Dewatered Bead Resin 14-210H Cask	March 4, 2014
14-RW-005	Liner of Dewatered Bead Resin 14-210H Cask	February 25, 2014
13-RW-037	14-210H Cask Type A, Activated RAM	December 23, 2013
13-RW-036	Dry Active Waste 14-210H Cask, Type A	December 5, 2013
13-RW-035	Dry Active Waste 14-210H Cask	November 11, 2013
13-RW-024	Dry Active Waste & Filters 14-210H Cask	November 2, 2013
13-SH-017	RCP Motor	February 8, 2013

Miscellaneous Documents

Number	Title	Date
	Dry Active Waste Stream Sample Reports	May 19, 2015
2014	Annual Radioactive Effluent Release Report	April 24, 2014
2014	Annual Radioactive Effluent Release Report	April 25, 2015
Chapters 11 & 12	Updated Final Safety Analysis Report	
NBA11C000110	Radiation Protection Technician Training Program Packaging Radioactive Material	July 24, 2013
NBA19C000107	Radiation Protection Technician Training Program Shipping Radioactive Material	October 10, 2012

Section 4OA1: Performance Indicator Verification

Miscellaneous Documents

Number	Title	Revision/Date
13-NS-C075	Palo Verde Basis Document	9
	Mitigating Systems Performance Index, High Pressure Injection System (NRC public website)	
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	August 31, 2013

Section 4OA2: Problem Identification and Resolution

Procedures

Number	Title	Revision
40OP-9CH01	CVCS Normal Operations	75E
73DP-0EE17	Gas Accumulation Management	2

Palo Verde Action Requests

4640670 4649692

Miscellaneous Documents

Number	Title	Revision/ Date
02-M-CHP-002	P&I Diagram Chemical and Volume Control System	50
15-343	PVNGS Ultrasonic Thickness Examination Report: Unit 2 Charging Pump 'A' & 'E'	April 4, 2015
15-339	PVNGS Ultrasonic Thickness Examination Report: Unit 1 HPSI 'A' Alignment Verification	April 2, 2015

Work Orders

4640520

Condition Reports

4411370 4493640 4636321 4640704

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

Procedures

Number	Title	Revision
40AO-9ZZ11	CEA Malfunctions	21

Procedures

Number	Title	Revision
40OP-9CH01	CVCS Normal Operations	75
40AL-9RK3A	Panel B03A Alarm Responses	35
40AL-9RK4A	Panel B04A Alarm Responses	44
40AO-9ZZ05	Loss of Letdown	25
40EP-9EO09	Functional Recovery	50

Condition Reports

4593834	4594327	4636321

Miscellaneous Documents

Number	Title	Revision
	ODMI: CEDM upper gripper coil voltage and current data collection	0
	Root Cause Evaluation Report: Unit 2 CEA 15 drop leads to manual reactor shutdown	2
LER 2014-002-01	Technical Specification required plant shutdown due to a dropped control element assembly	

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures

Number	Title	Revision
75DP-0RP01	RP Program Overview	10
75DP-9RP01	Radiation Exposure and Access Control	20
75RP-0RP01	Radiological Posting and Labeling	33
75RP-0RP02	Radiological Survey Schedule	10
75RP-9OP02	Control of High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas	26
75RP-9RP07	Radiological Surveys and Air Sampling	33
75RP-9RP18	Medical Uptakes of Radioisotopes	08
75RP-9RP25	Temporary Shielding	14
75RP-9RP26	Radioactive Source Control	16
75RP-9RP30	Radiation Protection Oversight of Radiography	01
75ST-9ZZ02	Radioactive Source Leak Test Surveillance	07

Audits, Self-Assessments, and Surveillances

Number	Title	Date
WO4445185	Radioactive Source Leak Test Surveillance	August 1, 2014
2014-007	Nuclear Assurance Department (NAD) Audit Plan and Report – Radiation Protection	October 3, 2014
	PVNGS Integrated Performance Assessment Report – Radiation Protection 3rd Quarter 2014	November 26, 2014
WO4445186	Radioactive Source Leak Test Surveillance	January 21, 2015

Palo Verde Action Requests

4565877	4565930	4572728	4579084	4588085
4591789	4591920	4592013	4594084	4594351
4598174	4598912	4599009	4605327	4614477
4625582	4625610	4627169	4628590	4637634
4642399	4642963	4643978	4643999	4644191
4644335				

Radiation Exposure Permits

Number	Title	Revision
3-1485	Regenerative Heat Exchanger Engineering Inspection	1
3-3001	Remove and Replace Reactor Vessel Head (RVH) and Upper Guide Structure (UGS)	3
3-3015	Refuel Cavity Decontamination	5
3-3306	Primary Side Steam Generator Maintenance	6
3-3310	Steam Generator Secondary Side Maintenance	5
3-3319	Reactor Coolant Pump Maintenance	5
3-3503	General Tours, Inspections and Job Planning Walkdowns	4
3-3512	Install/Remove Temporary Shielding	4
9-1035	Radiography Within the PVNGS OCA	2

Radiation Survey Records

Number	Title	Date
3-M-20131015-20	U3 C120 Regen HX – Containment	October 15, 2013
3-M-20131018-14	U3 C111 Regen HX – Containment	October 18, 2013
3-M-20150321-1	U3 R140 Neutron Source Room – Rad Waste	March 21, 2015
3-M-20150410-31	U3 C120 Regen HX – Containment	April 10, 2015
3-M-20150411-3	U3 Fuel Building – F140	April 11, 2015
3-M-20150412-40	U3 C080 Sump Area – Containment	April 12, 2015
3-M-20150413-38	U3 C-SG1 100' Access – Containment	April 13, 2015

Miscellaneous Documents

Number	Title	Date
4403964 and 4404044	Radiography Shot Plan: 3" and 6" Primary Alternate AF Supply Piping "Tie-in"	April 12, 2015
	Radioactive Source Inventory: Units 1, 2, and 3 (SourceTRAX)	April 13, 2015
	U1 Spent Fuel Pool Non-SNM Inventory Summary	April 14, 2015
	U2 Spent Fuel Pool Non-SNM Inventory Summary	April 14, 2015
	U3 Spent Fuel Pool Non-SNM Inventory Summary	April 16, 2015
App. B to 75RP-9OP2LHRA/VHRA Key Control Inventory for Unit 3		April 16, 2015

Section 2RS2: Occupational ALARA Planning and Controls

Procedures

Number	Title	Revision
75DP-0RP03	ALARA Program Overview	5
75DP-0RP06	ALARA Committee	6
75DP-0RP08	Managing Radiological Risk	2
75RP-9RP02	Radiation Exposure Permits	29
75RP-9RP12	ALARA Reports	5
75RP-9RP28	Radioactive Process Filter Management	6
75TD-9RP02	ALARA Work Planning	8
75TD-9RP04	RP Operations Manual	5

Radiation Exposure Permits

Number	Title	Revision
3-3306	Primary Side Steam Generator Maintenance	2

Radiation Exposure Permits

Number	Title	Revision
1-3306	Primary Side Steam Generator Maintenance	1
3-3002	Reactor Destack and Restack	4

Condition Reports Disposition Reports

4593982 4630890 4632212

Palo Verde Action Requests

4592658 4626335 4630198 4631551

Miscellaneous Documents

Number	Title	Date
ENG#4627142	Evaluation Pipe Stress of Lead Shielding: SI Line B-072-FCBA-20	January 22, 2015
	ALARA 1R18 Outage Report	March 10, 2015
	ALARA 2R18 Outage Report	June 3, 2014
	ALARA 5 Year Plan 2013 - 2017	March 20, 2013
	ALARA Committee Meeting	April 16, 2015
	ALARA Committee Meeting	April 15, 2015

Audits, Self-Assessments, and Surveillances

Number	Title	Date
2014-007	Radiation Protection Audit Report	October 3, 2014

Radiation Surveys

Number	Title	Date
1-M-20150212-1	TSC/VCC 123 Stackup	February 17, 2015

PAPERWORK REDUCTION ACT STATEMENT

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

Information Request
January 27, 2014
Notification of Inspection and Request for Information
Palo Verde Nuclear Generating Station, Unit 3
NRC Inspection Reports 05000530/2015002

On April 13, 2015, reactor inspector(s) from the Nuclear Regulatory Commission's (NRC) Region IV office will perform the baseline inservice inspection at Palo Verde Nuclear Generating Station, 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. 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 inspectors are adequately prepared. The second group (Section B of the enclosure) identifies the information the inspectors will need upon arrival at the site. It is important that all of these documents are up to date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection.

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

Preparation week: April 6 – 10, 2015
Onsite weeks: April 13 – 24, 2015

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 Gerond George at (817) 200-1562 (Gerond.George@nrc.gov).

A. Information to be Provided to the Inspector(s) for Review during the Preparation Week (April 6, 2015):

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 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 walkdowns, bolted connection walkdowns, etc.)

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

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

i. 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 reference numbers for 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 noncode 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.

A.2 Reactor Pressure Vessel Head

a) Provide a detailed scope of the planned bare metal visual examinations (e.g., volume coverage, limitations, etc.) of the vessel upper head penetrations and/or any nonvisual nondestructive examination of the reactor vessel head including the examination procedures to be used.

    i. Provide the records recording the extent of inspection for each penetration nozzle including documents which resolved interference or masking issues that confirm that the extent of examination meets 10 CFR 50.55a(g)(6)(ii)(D).

    ii. Provide records that demonstrate that a volumetric or surface leakage path examination assessment was performed.

b) Copy of current calculations for EDY, and RIY as defined in Code Case N-729-1 that establish the volumetric and visual inspection frequency for the reactor vessel head and J-groove welds.

A.3 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 shutdown, please provide documentation of containment walkdown inspections performed as part of the boric acid corrosion control program.

A.4 Steam Generator Tube Inspections

a) A detailed schedule of steam generator secondary side inspection activities for the upcoming outage (if occurring).

A.5 Additional Information Related to all Inservice Inspection Activities

b) A list with a brief description of inservice inspection, boric acid corrosion control program, and steam generator tube inspection related issues (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 or steam generator tube degradation such as: inservice inspection, ASME Code, Section XI, NDE, cracks, wear, thinning, leakage, rust, corrosion, boric acid, or errors in piping/steam generator tube examinations.

c) Provide training (e.g. Scaffolding, Fall Protection, FME, Confined Space) if they are required for the activities described in A.1 through A.4.

d) Please provide names and phone numbers for the following program leads:

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

B. Information to be Provided Onsite to the Inspector(s) at the Entrance Meeting (April 13, 2015):

B.1 Inservice Inspection / Welding Programs and Schedule Information

a) Updated schedules for inservice inspection/nondestructive examination activities, including 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 Reactor Pressure Vessel Head (RPVH) (if applicable)

Documents requested under Inspection Procedure 71007, "Reactor Vessel Head Replacement Inspection."

B.3 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.4 Steam Generator Tube Inspections

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

b) 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.).

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

d) 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.

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

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

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

B.5 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):

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

   ii. EPRI and industry standards referenced in the procedures used to perform the steam generator tube eddy current examination.

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) EPRI and industry standard references in the site procedures used to perform the SG tube eddy current examination, which includes EPRI documents: TR-107621-R1, "Steam Generator Integrity Assessment Guidelines," TR-107620-R1, "Steam Generator In-Situ Pressure Test Guidelines," Steam Generator Management Program: Steam Generator Integrity Assessment Guidelines, Part 10, and 1003138, "Pressurized Water Reactor Steam Generator Examination Guidelines."

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

The following items are requested for the Occupational Radiation Safety Inspection at Palo Verde Nuclear Generating Station (April 13 – 17, 2015) Integrated Report 2015002

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **March 30, 2015**.

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

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

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

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

If you have any questions or comments, please contact the lead inspector, Natasha Greene, at (817)200-1154 or Natasha.Greene@nrc.gov.

Currently, the other inspector will be Louis Carson [(817)200-1221 or Louis.Carson@nrc.gov].

PAPERWORK REDUCTION ACT STATEMENT

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

1. Radiological Hazard Assessment and Exposure Controls (71124.01)
Date of Last Inspection: October 31, 2014

A. List of contacts (with official title) and telephone numbers for the Radiation Protection Organization Staff and Technicians

B. Applicable organization charts

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

D. Procedure indexes for the radiation protection procedures

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

F. List of corrective action documents (including corporate and subtiered systems) since date of last inspection
a. Initiated by the radiation protection organization
b. Assigned to the radiation protection organization
c. Identify any CRs that are potentially related to a performance indicator event

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

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

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

H. List of active radiation work permits

I. Radioactive source inventory list

2. Occupational ALARA Planning and Controls (71124.02)
Date of Last Inspection: February 21, 2014

A. List of contacts (with official title) and telephone numbers for ALARA program personnel

B. Applicable organization charts

C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA

D. Procedure index for ALARA Program

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
1. ALARA Program
2. ALARA Committee
3. Radiation Work Permit Preparation

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates.

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable."

G. List of work activities greater than 1 rem, since date of last inspection. Include original dose estimate and actual dose.

H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)

I. Outline of source term reduction strategy

The following items are requested for the
Radiation Safety Team Inspection
at
Palo Verde Nuclear Generating Station
June 8-12, 2015
Inspection Report Number 50-528, 529, & 530/2015-01

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **May 27, 2015**.

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

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

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

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

If you have any questions or comments, please contact **Louis Carson** at **(817) 200-1221** or **Louis.Carson@nrc.gov.** Also, John O'Donnell will be the Lead Team Inspector.

PAPERWORK REDUCTION ACT STATEMENT

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

5. Radiation Monitoring Instrumentation (71124.05)

1. Date of Last Inspection: January 2013

A. List of contacts and telephone numbers for the following areas:
   2. Effluent monitor calibration
   3. Radiation protection instrument calibration
   4. Installed instrument calibrations
   5. Count room and Laboratory instrument calibrations

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
   2. Installed radiation monitors

D. Procedure index for:
   1. Calibration, use and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.
   2. Calibration of installed radiation monitors

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
   1. Calibration of portable radiation detection instruments (for portable ion chambers)
   2. Whole body counter calibration
   3. Laboratory instrumentation quality control

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the following programs:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, whole body counters,
   2. Installed radiation monitors,
   3. Effluent radiation monitors
   4. Count room radiation instruments

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

G. Offsite dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements.

H. Current calibration data for the whole body counter's.

I. Primary to secondary source calibration correlation for effluent monitors.

J. A list of the point of discharge effluent monitors with the two most recent calibration dates and the work order numbers associated with the calibrations.

K. Radiation Monitoring System health report for the previous 12 months

6. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

1. Date of Last Inspection: January 2013

A. List of contacts and telephone numbers for the following areas:
   1. Radiological effluent control
   2. Engineered safety feature air cleaning systems

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
   1. Radioactive effluents
   2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas
   1. Radioactive effluents
   2. Engineered Safety Feature Air cleaning systems

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
   1. Sampling of radioactive effluents
   2. Sample analysis
   3. Generating radioactive effluent release permits
   4. Laboratory instrumentation quality control
   5. In-place testing of HEPA filters and charcoal adsorbers
   6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and subtiered systems) written since date of last inspection, associated with:
   1. Radioactive effluents
   2. Effluent radiation monitors
   3. Engineered Safety Feature Air cleaning systems

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

G. Provide the 2013 Annual Radioactive Effluent Release Report, or the two most recent reports.

H. Current Copy of the Offsite Dose Calculation Manual

I. Copy of the 2013 and 2014 interlaboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results.

J. Effluent sampling schedule for the week of the inspection

K. New entries into 10 CFR 50.75(g) files since date of last inspection

L. Operations department (or other responsible dept.) log records for effluent monitors removed from service or out of service

M. Listing or log of liquid and gaseous release permits since date of last inspection

N. A list of the technical specification-required air cleaning systems with the two most recent surveillance test dates of in-place filter testing (of HEPA filters and charcoal adsorbers) and laboratory testing (of charcoal efficiency) and the work order numbers associated with the surveillances

O. System Health Report for radiation monitoring instrumentation. Also, please provide a specific list of all effluent radiation monitors that were considered inoperable for 7 days or more since January 2013**.** If applicable, please provide the relative Special Report and condition report(s).

P. A list of all radiation monitors that are considered §50.65/Maintenance Rule equipment.

Q. A list of all significant changes made to the Gaseous and Liquid Effluent Process Monitoring System since the last inspection, January 2013. If applicable, please provide the corresponding UFSAR section in which this change was documented.

R. A list of any occurrences in which a non-radioactive system was contaminated by a radioactive system. Please include any relative condition report(s).

7. Radiological Environmental Monitoring Program (71124.07)
Date of Last Inspection: January 2013

A. List of contacts and telephone numbers for the following areas:
1. Radiological environmental monitoring
2. Meteorological monitoring

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
1. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
2. Environmental TLD processing facility
3. Meteorological monitoring program

D. Procedure index for the following areas:
1. Radiological environmental monitoring program
2. Meteorological monitoring program

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
1. Environmental Program Description
2. Sampling, collection and preparation of environmental samples
3. Sample analysis (if applicable)
4. Laboratory instrumentation quality control
5. Procedures associated with the Offsite Dose Calculation Manual
6. Appropriate QA Audit and program procedures, and/or sections of the station's QA manual (which pertain to the REMP)

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the following programs:
1. Radiological environmental monitoring
2. Meteorological monitoring

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

G. Wind Rose data and evaluations used for establishing environmental sampling locations

H. Copies of the 2 most recent calibration packages for the meteorological tower instruments

I. Copy of the 2013 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Offsite Dose Calculation Manual, or the two most recent reports.

J. Copy of the environmental laboratory's interlaboratory comparison program results for 2013 and 2014, or the two most recent results, if not included in the annual radiological environmental operating report

K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)

L. Quality Assurance audits (e.g., NUPIC) for contracted services

M. Current NEI Groundwater Initiative Plan and status

N. Technical requirements manual or licensee controlled specifications which lists the meteorological instruments calibration requirements

O. A list of Regulatory Guides and/or NUREGs that you are currently committed to relative to the *Radiological Environmental Monitoring Program*. Please include the revision and/or date for the committed item and where this can be located in your current licensing basis/UFSAR.

P. If applicable, per NEI 07-07, provide any reports that document any spills/leaks to groundwater since the last inspection

8. Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)

A. List of contacts and telephone numbers for the following areas:
   1. Solid Radioactive waste processing
   2. Transportation of radioactive material/waste

B. Applicable organization charts (and list of personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials)

C. Copies of audits, department self-assessments, and LERs written since date of last January 2013 inspection related to:
   1. Solid radioactive waste management
   2. Radioactive material/waste transportation program

D. Procedure index for the following areas:
   1. Solid radioactive waste management
   2. Radioactive material/waste transportation

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
   1. Process control program
   2. Solid and liquid radioactive waste processing
   3. Radioactive material/waste shipping
   4. Methodology used for waste concentration averaging, if applicable
   5. Waste stream sampling and analysis

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, January 2013, related to:
   1. Solid radioactive waste
   2. Transportation of radioactive material/waste

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

G. Copies of training lesson plans for 49CFR172 subpart H, for radwaste processing, packaging, and shipping.

H. A summary of radioactive material and radioactive waste shipments made from date of last inspection, January 2013 to present

I. Waste stream sample analyses results and resulting scaling factors for 2013 and 2014, or the two most recent results.

J. Waste classification reports if performed by vendors (such as for irradiated hardware)

K. A listing of all onsite radwaste storage facilities. Please include a summary *or* listing of the items stored in each facility, including the *total* amount of radioactivity and the *highest* general area dose rate.

Although it is not necessary to compile the following information, the inspector will also review:

L. Training, and qualifications records of personnel responsible for the conduct of radioactive waste processing, package preparation, and shipping