



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

August 3, 2010

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

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION -- NRC INTEGRATED
INSPECTION REPORT 05000528/2010003, 05000529/2010003, and 05000530/2010003

Dear Mr. Edington:

On June 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed integrated inspection report documents the inspection findings, which were discussed on July 6, 2010, with Mr. Bement, Vice President Nuclear Operations, and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding and two self-revealing findings of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest these violations or the significance of the noncited violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Boulevard, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. In addition, if you disagree with the crosscutting aspect assigned to any finding 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 Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility.

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

Arizona Public Service Company - 2 -

Room or from the Publicly Available Records 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).

Sincerely,

/RA/

Ryan Lantz, Chief
Project Branch D
Division of Reactor Projects

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

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NRC Inspection Report 05000528/2010003, 05000529/2010003, and 05000530/2010003
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- 4 -

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ADAMS: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		<input checked="" type="checkbox"/> SUNSI Review Complete		Reviewer Initials: DBA	
		<input checked="" type="checkbox"/> Publicly Available		<input checked="" type="checkbox"/> Non-Sensitive	
		<input type="checkbox"/> Non-publicly Available		<input type="checkbox"/> Sensitive	
RIV:RI:DRP/D	RI:DRP/D	RI:DRP/D	SRI:DRP/D	SPE:DRP/D	C:DRS/OB
JBashore	MCatts	MBaquera	RITreadway	DAllen	MHaire
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0723 /2010	07/26/2010	07/29/2010	07/26/2010	07/23/2010	07/23/2010
C:DRS/EB2	C:DRS/PSB1	C:DRS/EB1	C:DRS/PSB2	C:DRS/TSS	C:DRP/D
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 50-528, 50-529, 50-530

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

Report: 05000528/2010003, 05000529/2010003, 05000530/2010003

Licensee: Arizona Public Service Company

Facility: Palo Verde Nuclear Generating Station, Units 1, 2, and 3

Location: 5951 S. Wintersburg Road
Tonopah, Arizona

Dates: April 1 through June 30, 2010

Inspectors: R. Treadway, Senior Resident Inspector
J. Bashore, Resident Inspector
M. Baquera, Resident Inspector
M. Catts, Resident Inspector
I. Anchondo, Reactor Inspector
L. Carson II, Senior Health Physicist
S. Makor, Reactor Inspector
L. Ricketson, P.E., Senior Health Physicist

Approved By: Ryan Lantz, Chief, Project Branch D
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000528/2010003, 05000529/2010003, 05000530/2010003; 04/01-06/30/10; Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Integrated Resident and Regional Report; Maint. Effectiveness; Ident. and Resolution of Problems; and Event Follow-up.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region based inspectors. Three Green findings, two of which were noncited violations, were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding was identified for the failure of maintenance personnel to provide adequate procedures and ensure work was performed properly for installation of the ducting for the 13.8 kV bus to ensure it was weather tight. Specifically, on March 7, 2010, the 1E-NAN-A03 electrical bus catastrophically failed due to water intrusion from heavy rains due to improper installation of the ducting in November 2007. The licensee has implemented corrective actions to provide adequate instruction for this maintenance activity and training for maintenance personnel, and has entered this issue into the licensee's corrective action program as Condition Report Disposition Request 344792.

The finding was more than minor because it affected the configuration control attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and mitigating equipment or functions not being available. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee failed to ensure training of personnel was adequate to assure nuclear safety [H.2.(b)] (Section 40A2).

Cornerstone: Barrier Integrity

- Green. A self-revealing noncited violation of Technical Specification 5.4.1, "Procedures," was identified for the failure of maintenance personnel to follow work instructions during the 1R15 refueling outage. Specifically, on May 2, 2010, maintenance personnel were performing maintenance on the containment

equipment hatch hoist and failed to ensure an adequate postmaintenance test was completed. On May 8, maintenance personnel discovered that the hoist would not completely lower and that they could not position the containment equipment hatch due to a malfunctioning lower limit switch. The licensee readjusted the malfunctioning limit switch for the west hoist to restore the ability to close the containment hatch and performed a proper postmaintenance test as a corrective action and entered this issue into the licensee's corrective action program as Palo Verde Action Request 3478220.

The finding was more than minor because it affected the configuration control attribute of the Barrier Integrity Cornerstone, and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," Figure 6.2, the finding was determined to have very low safety significance because the finding occurred in a time window greater than 8 days after the start of the outage. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because the licensee failed to ensure personnel do not proceed in the face of uncertainty or unexpected circumstances [H.4.(a)] (Section 1R12).

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a noncited violation of 10 CFR 50.47(b)(4) for the failure of operations personnel to adequately implement the emergency plan. Specifically, on March 22, 2010, leakage from the packing of a main pressurizer spray valve at a rate of 12 gpm into the reactor drain tank was incorrectly diagnosed as "unidentified leakage". This led operations personnel to declare a Notification of Unusual Event when the emergency action thresholds for this emergency classification level had not actually been met. The licensee has taken action to train operations personnel on leakage diagnosis and classification to restore compliance and entered this issue into the licensee's corrective action program as Palo Verde Action Request 3484532.

The finding was more than minor because it adversely affected the Emergency Response Organization performance attribute of the Emergency Preparedness Cornerstone and affected the cornerstone objective to ensure the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Using Manual Chapter 0609 Appendix B, "Emergency Preparedness Significance Determination Process," Sheet 2, the finding was determined to have very low safety significance because the actual event implementation problem was associated with a Notice of Unusual Event. This finding has a crosscutting aspect in the area of human performance associated with resources component because the licensee failed to ensure training of personnel was adequate to assure consistent interpretation of the emergency action levels [H.2.(b)] (Section 4OA3).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at full power until April 3, 2010, when the unit was shut down for refueling outage 15. The unit was restarted on May 23, 2010, and returned to full power on May 28, 2010. Unit 1 remained at full power until June 18, 2010, when the unit reduced power to approximately 12 percent in response to a loss of cooling to the C phase main transformer. The unit returned to full power on June 21, 2010, and remained at full power for the duration of the inspection period.

Unit 2 operated at full power for the duration of the inspection period.

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

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

Summer Readiness for Offsite and Alternate-ac Power

a. Inspection Scope

The inspectors performed a review of preparations for summer weather for selected systems, including conditions that could lead to loss-of-offsite power and conditions that could result from high temperatures. The inspectors reviewed the procedures affecting these areas and the communications protocols between the transmission system operator and the plant to verify that the appropriate information was being exchanged when issues arose that could affect the offsite power system. The inspectors' review included the May 26 - 28, 2010, Unit 2, summer seasonal readiness for offsite and ac power sources

During the inspection, the inspectors focused on plant-specific design features and the procedures used by plant personnel to mitigate or respond to seasonal high temperature conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying seasonal weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the systems in the following locations:

- Non essential 13.8 kV ac and 4160 V ac distribution system

- Essential 4160 V ac distribution system, including the engineered safety feature (ESF) transformers and switchyard tour

These activities constitute completion of one readiness for summer weather affect on offsite and alternate-ac power sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- April 22, 2010, Unit 2, auxiliary feedwater system train B
- June 10, 2010, Unit 3, emergency diesel generator train A
- June 29, 2010, Unit 2, 4160 volt Class 1E Power train B

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system and potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On April 22, 2010, the inspectors performed a complete system alignment inspection of the containment spray train B to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.3 System Walkdown associated with Temporary Instruction (TI) 2515/177, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems

Additional activities were performed during this system walkdown that were associated with TI 2515/177, "Managing gas accumulation in emergency core cooling, decay heat removal, and containment spray systems." These activities are described in bullet .2 of this section.

a. Inspection Scope

On April 22, 2010, the inspectors conducted a walkdown of containment spray system, train B, in sufficient detail to reasonably assure the acceptability of the licensee's walkdowns (TI 2515/177, Section 04.02.d). The inspectors also verified that the information obtained during the licensee's walkdowns was consistent with the items identified during the inspector's independent walkdown (TI 2515/177, Section 04.02.c.3). In addition, the inspectors verified that the licensee had isometric drawings that describe the containment spray system configurations and had acceptably confirmed the accuracy of the drawings (TI 2515/177, Section 04.02.a). The inspectors verified the following related to the isometric drawings:

- High point vents were identified

- High points that do not have vents were acceptably recognizable
- Other areas where gas can accumulate and potentially impact subject system operability, such as at orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and under closed valves, were acceptably described in the drawings or in referenced documentation
- Horizontal pipe centerline elevation deviations and pipe slopes in nominally horizontal lines that exceed specified criteria were identified
- All pipes and fittings were clearly shown
- The drawings were up-to-date with respect to recent hardware changes and that any discrepancies between as-built configurations and the drawings were documented and entered into the corrective action program for resolution

The inspectors verified that piping and instrumentation diagrams accurately described the subject systems, that they were up-to-date with respect to recent hardware changes, and any discrepancies between as-built configurations, the isometric drawings, and the piping and instrumentation diagrams were documented and entered into the corrective action program for resolution (TI 2515/177, Section 04.02.b).

Documents reviewed are listed in the attachment to this report.

This inspection effort counts towards the completion of TI 2515/177 which will be closed in a later inspection report.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- April 22, 2010, Units 1, 2, and 3, fire diesel pump, trains A and B
- May 4 - 5, 2010, Unit 1, containment, all elevations
- May 6, 2010, Unit 1, control building, 74 to 160 foot elevations

- May 24, 2010, Unit 2, control building, 74 foot, 100 foot, lower cable spreading room, and upper cable spreading room

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that: (1) fire hoses and extinguishers were in their designated locations and available for immediate use; (2) fire detectors and sprinklers were unobstructed; (3) transient material loading was within the analyzed limits; and (4) fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

Internal Flooding

a. Inspection Scope

The inspectors reviewed the UFSAR, the flooding analysis, and plant procedures to: (1) assess susceptibilities involving internal flooding; (2) determine if licensee personnel identified and corrected flooding problems in the corrective action program; (3) verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for underground bunkers/manholes; and (4) verify that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the May 19, 2010, Units 1, 2, and 3, emergency core cooling pump rooms to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one flood protection measures inspection sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R08 In-service Inspection Activities (71111.08)

.1 Inspection Activities Other Than Steam Generator Tube Inspection, Pressurized Water Reactor Vessel Upper Head Penetration Inspections, and Boric Acid Corrosion Control (71111.08-02.01)

a. Inspection Scope

The inspectors reviewed five types of nondestructive examination activities and one weld on the reactor coolant system pressure boundary.

The inspectors directly observed the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Auxiliary Feedwater	Feedwater Isolation to Steam Generator 1 (AFB-18-H-1)	Penetrant Testing
Safety Injection	23-16	Ultrasonic Testing
Safety Injection	23-15	Ultrasonic Testing
Auxiliary Feedwater	Feedwater Isolation to Steam Generator 1 (AF-18-H-1)	Visual Testing
Safety Injection 1B	11-10	Phase Array Ultrasonic
Safety Injection 2B	15-9	Phase Array Ultrasonic

The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
	Reactor Vessel Head Flange	Magnetic Particle Testing
Steam Generator 1	Primary Inlet Nozzle (3-100)	Ultrasonic Testing
Steam Generator 1	Primary Inlet Nozzle (3-100 IR)	Ultrasonic Testing
Steam Generator 2	Primary Inlet Nozzle (4-100)	Ultrasonic Testing
Steam Generator 2	Primary Inlet Nozzle (4-100 IR)	Ultrasonic Testing
Safety Injection	Safety Injection SI-189	Radiographic Testing
Safety Injection 1A	9-10	Phase Array Ultrasonic
Safety injection 2A	13-10	Phase Array Ultrasonic

<u>SYSTEM</u>	<u>IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Safety Injection 1A	23-15, 23-16	Penetrant Testing
Shutdown Cooling Loop 1	6-11-OL, 21-2-OL	Ultrasonic Testing
Shutdown Cooling Loop 2	7-9-OL, 22-1-OL	Ultrasonic Testing
Drain Line 1A	8-18	Visual Testing
Drain Line 2A	12-18	Visual Testing
Drain Line 1B	10-18	Visual Testing
Letdown Line	14-18	Visual Testing

During the review and observation of each examination, the inspectors verified that activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspectors also verified the qualifications of all nondestructive examination technicians performing the inspections were current.

The inspectors observed and reviewed records for the following welds:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>WELDING TYPE</u>
Safety Injection	3136754	GTAW – Manual, Machine SMAW - Manual

The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX, requirements. The inspectors also verified, through observation and record review, that essential variables for the welding process were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 71111.08-02.01.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities (71111.08-02.02)

a. Inspection Scope

The Unit 1 reactor pressure vessel head was replaced during this outage. The required inspections were performed and are documented in Section 4OA5 of this report.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities (71111.08-02.03)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedure 73DP-9ZC01, "Boric Acid Corrosion Control Program," Revision 3, and Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 9. The inspectors also reviewed the visual records of the components and equipment. The inspectors verified that the visual inspections emphasized locations where boric acid leaks could cause degradation of safety-significant components. The inspectors also verified that the engineering evaluations for those components where boric acid was identified gave assurance that the American Society of Mechanical Engineers (ASME) Code wall thickness limits were properly maintained. The inspectors confirmed that the corrective actions performed for evidence of boric acid leaks were consistent with requirements of the ASME Code. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 71111.08-02.03.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities (71111.08-02.04)

a. Inspection Scope

The inspectors assessed the in situ screening criteria to assure consistency between assumed nondestructive examination flaw sizing accuracy and data from the Electric Power Research Institute (EPRI) examination technique specification sheets. No conditions were identified that warranted in situ pressure testing.

Due to the tube wear identified during the previous outage, a 100 percent review of all tubes in both steam generators was performed during this outage. In addition, the

inspectors reviewed both the licensee site-validated and qualified acquisition and analysis technique sheets used during this refueling outage and the qualifying EPRI examination technique specification sheets to verify that the essential variables regarding flaw sizing accuracy, tubing, equipment, technique, and analysis had been identified and qualified through demonstration.

The inspection procedure specified comparing the estimated size and number of tube flaws detected during the current outage against the previous outage operational assessment predictions to assess the licensee's prediction capability. The number of identified indications fell within the range of prediction and was consistent with predictions from the vendor for the previous outage. No new damage mechanisms were identified during this inspection.

The inspection procedure specified confirmation that the steam generator tube eddy current test scope and expansion criteria meet technical specification requirements, EPRI guidelines, and commitments made to the NRC. The inspectors evaluated the recommended steam generator tube eddy current test scope established by technical specification requirements and the licensee's degradation assessment report. The inspectors compared the recommended test scope to the actual test scope and found that the licensee had accounted for all known flaws and had, as a minimum, established a test scope that met technical specification requirements, EPRI guidelines, and commitments made to the NRC.

As mentioned above, the base scope inspection plan required 100 percent tube inspection for this refueling outage (1R15). The inspection scope for refueling outage 1R15 included:

- 1) 100 percent visual inspection of installed plugs
- 2) Tubesheet secondary side foreign object search and retrieval
- 3) 100 percent bobbin examination in both generators from tube end to tube end
- 4) Plus point inspection of U-bends in rows 1 through 4
- 5) Plus point inspection of special interest locations

Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements of Section 71111.08-02.04.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems (71111.08-02.05)

a. Inspection scope

The inspectors reviewed six condition reports which dealt with inservice inspection activities and found the corrective actions were appropriate. The specific condition reports reviewed are listed in the documents reviewed section. From this review the

inspectors concluded that the licensee has an appropriate threshold for entering issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying industry operating experience. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements of Section 71111.08-02.05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Quarterly Review

a. Inspection Scope

On May 25, 2010, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely and conservative actions
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from senior reactor operators
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- May 8, 2010, Unit 1, containment hatch failure to close
- June 4, 2010, Units 1, 2, and 3, main steam isolation valves actuators maintenance effectiveness review

The inspectors reviewed events caused by ineffective equipment maintenance that resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

Introduction. A Green self-revealing noncited violation of Technical Specification 5.4.1, "Procedures," was identified for the failure of maintenance personnel to follow work instructions during the 1R15 refueling outage. Specifically, on May 2, 2010, maintenance personnel were performing maintenance on the containment equipment hatch hoist and failed to ensure an adequate postmaintenance test was completed. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3478220.

Description. On May 1, 2010, Unit 1 was in day 28 of refueling outage 1R15, the containment equipment hatch was open and core alterations were in progress. Palo Verde Technical Specification 3.9.3, "Containment Penetrations," required, in part, that the licensee maintain the ability to close the equipment hatch during core alterations. On the evening of May 1, 2010, maintenance personnel were performing corrective maintenance to address a malfunction with the upper limit switch on the west hoist used for positioning the equipment hatch. There are two hoists, an east and a west, which are used to reposition the containment equipment hatch. The scheduled work was completed at approximately 2 a.m. on the morning of May 2, 2010. During an attempt to close the containment hatch on May 8, 2010, maintenance personnel identified that the equipment hatch would not fully close due to a malfunction with the lower limit switch of the west hoist.

During their review, the inspectors determined that an adequate postmaintenance test of the equipment hatch was not completed as required by work order 3236820. The inspectors also noted that core alterations were in progress and not completed until the evening of May 2, 2010. The postmaintenance test required the equipment hatch to be lowered with the hoists and fully close to ensure the hoists were functioning properly. The inspectors discussed this issue with the maintenance personnel involved with this work activity, and noted that a large storage container was under the equipment hatch during this maintenance which prevented a full closure to occur as required by the postmaintenance test. The maintenance personnel determined that performance of a partial closure of the equipment hatch would be sufficient because of the large storage container's interference.

Analysis. The performance deficiency associated with this finding involved the failure of maintenance personnel to follow work instructions. The finding was more than minor because it affected the configuration control attribute of the Barrier Integrity Cornerstone, and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," Figure 6.2, the finding was determined to have very low safety significance because the finding occurred in a time window greater than 8 days after the start of the outage. This finding has a crosscutting aspect in the area of human performance associated with work practices component because the licensee failed to ensure personnel do not proceed in the face of uncertainty or unexpected circumstances [H.4.(a)].

Enforcement. Technical Specification 5.4.1, "Procedures," requires that procedures be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33, Appendix A. Regulatory Guide 1.33, Appendix A, Paragraph 9.a., states, in part, maintenance that can affect the performance of safety related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to the above the licensee did not perform work in accordance with written instructions. Specifically, on May 2, 2010, maintenance personnel failed to perform an adequate postmaintenance test as required by the work instruction and ensure the containment equipment hatch would fully close if required. On May 8, 2010, when maintenance personnel identified that the equipment hatch would not fully close, the licensee readjusted the malfunctioning limit switch for the west hoist and restored the ability to close the containment hatch and performed a proper postmaintenance test as a corrective action to restore compliance. 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 3478220, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000528/2010003-01, "Inadequate Postmaintenance Test Results with an Inoperable Containment."

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

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- March 19, 2010, Units 1, 2, and 3, risk was not properly assessed and disseminated throughout the work management organization prior to performing emergent work activities
- May 3, 2010, Unit 2, essential cooling water heat exchanger train A out of service to plug failed tube

The inspectors selected these activities based on potential risk-significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- January 24, 2010, Unit 3, operability evaluation for essential cooling water system train B elevated copper concentration
- April 2, 2010, Unit 3, shutdown heat exchanger A outlet to fuel pool isolation valve slow to close
- April 8, 2010, Unit 1, spray pond B motor cable splice
- May 19, 2010, Units 1, 2, and 3, 125 Vdc tripping power unavailable for start-up transformers

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended

and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

To verify that the safety functions of important safety systems were not degraded, the inspectors reviewed the temporary modification identified as:

- April 16, 2010, Unit 1, installation of temporary diesel generator for refueling outage 15 containment hatch closure, if required during an accident with a loss of offsite power

The inspectors reviewed the temporary modification and the associated safety-evaluation screening against the system design bases documentation, including the UFSAR and the technical specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample for temporary plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings were identified.

.2 Permanent Modifications

The inspectors reviewed key affected parameters associated with energy needs, materials, replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flow paths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the permanent modification listed below.

- April 1-30, 2010, Unit 1, installation of motor operated containment isolation valve as corrective actions for pipe voiding

The inspectors verified with respect to modification preparation, staging, and implementation that; (1) licensee actions did not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; (2) postmodification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur; (3) systems, structures and components' performance characteristics still meet the design basis; (4) the modification design assumptions were appropriate; (5) the modification test acceptance criteria will be met; and (6) licensee personnel identified and implemented appropriate corrective actions associated with permanent plant modification. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample for permanent plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- April 9, 2010, Unit 3, main steam isolation valve 170 following corrective maintenance
- May 3, 2010, Unit 2, main steam isolation valve 180 actuator accumulator hydraulic pump, train A, replacement
- May 25, 2010, Unit 2, 2J-SGA-UV-0138A failure causing auxiliary feedwater train A turbine over-speed trip
- June 10, 2010, Unit 3, emergency diesel generator train A

- June 23, 2010, Unit 1, replacement of Eaton-Cutler Hammer type ARD relays for containment valves SGA-UV-1133 and SGA-UV-1134

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following:

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the Unit 1 refueling outage, conducted April 3 through May 23, 2010, to confirm licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense in depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense in depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing

- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities
- Monitoring of decay heat removal processes, systems, and components
- Verification that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss
- Controls over activities that could affect reactivity
- Maintenance of secondary containment as required by the technical specifications
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing
- Licensee identification and resolution of problems related to refueling outage activities

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one refueling outage and other outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions.

The inspectors witnessed test performance and/or reviewed test performance documentation to verify that the significant surveillance test attributes were adequate to address the following:

- Prevention of preconditioning
- Evaluation of testing impact on the plant
- Clear acceptance criteria and procedure guidance
- Adequacy test equipment
- Adequacy of documentation of test results and data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- April 13, 2010, Unit 2, containment spray alignment verification, train B
- April 22, 2010, Units 1, 2, and 3, station blackout generators trains A and B
- May 5, 2010, Unit 2, main steam isolation valves 180/181 inservice test
- June 8, 2010, Unit 2, safety injection train B valves inservice test
- June 23, 2010, Unit 1, containment isolation valves SGA-UV-1133 and SGA-UV-1134 surveillance test

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

.2 Surveillance Testing associated with Temporary Instruction (TI) 2515/177, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems

a. Inspection Scope

On April 13, 2010, the inspectors reviewed the Unit 2 containment spray train B alignment surveillance test to verify that the procedure was acceptable for (1) testing associated with power operation, shutdown operation, maintenance, and system modifications; (2) void determination and elimination methods; and (3) post event evaluation.

The inspectors reviewed Procedure 40 ST-9SI13, "LPSI and CS Alignment Verification," Revision 20, used for conducting surveillances and determining void volumes to ensure that the void criteria were satisfied and will be reasonably ensured to be satisfied until the next scheduled void surveillance (TI 2515/177, Section 04.03.a). Also, the inspectors reviewed procedures used for filling and venting following conditions which may have introduced voids into the systems to verify that the procedures acceptably addressed testing for such voids and provided acceptable processes for their reduction or elimination (TI 2515/177, Section 04.03.b). Specifically, the inspectors verified that:

- Gas intrusion prevention, refill, venting, monitoring, trending, evaluation, and void correction activities were acceptably controlled by approved operating procedures (TI 2515/177, Section 04.03.c.1)
- Procedures ensured the system did not contain voids that may jeopardize operability (TI 2515/177, Section 04.03.c.2)
- Procedures established that void criteria were satisfied and will be reasonably ensured to be satisfied until the next scheduled void surveillance (TI 2515/177, Section 04.03.c.3)
- The licensee entered changes into the corrective action program as needed to ensure acceptable response to issues. In addition, the inspectors confirmed that a clear schedule for completion was included for corrective action program entries that have not been completed (TI 2515/177, Section 04.03.c.5)
- Procedures included independent verification that critical steps were completed (TI 2515/177, Section 04.03.c.6)

The inspectors verified the following with respect to surveillance and void detection:

- Specified surveillance frequencies were consistent with technical specification surveillance requirements (TI 2515/177, Section 04.03.d.1)

- Surveillance frequencies were stated or, when conducted more often than required by technical specifications, the process for their determination was described (TI 2515/177, Section 04.03.d.2)
- Surveillance methods were acceptably established to achieve the needed accuracy (TI 2515/177, Section 04.03.d.3)
- Surveillance procedures included up-to-date acceptance criteria (TI 2515/177, Section 04.03.d.4)
- Procedures included effective follow-up actions when acceptance criteria are exceeded or when trending indicates that criteria may be approached before the next scheduled surveillance (TI 2515/177, Section 04.03.d.5)
- Measured void volume uncertainty was considered when comparing test data to acceptance criteria (TI 2515/177, Section 04.03.d.6)
- Venting procedures and practices utilized criteria such as adequate venting durations and observing a steady stream of water (TI 2515/177, Section 04.03.d.7)
- An effective sequencing of void removal steps was followed to ensure that gas does not move into previously filled system volumes (TI 2515/177, Section 04.03.d.8)
- Qualitative void assessment methods were included only when expectations are that the void will be significantly less than allowed by acceptance criteria (TI 2515/177, Section 04.03.d.9)
- Venting results were trended periodically to confirm that the systems are sufficiently full of water and that the venting frequencies are adequate. The inspectors also verified that records of the quantity of gas at each location are maintained and trended as a means of preemptively identifying degrading gas accumulations (TI 2515/177, Section 04.03.d.10)
- Surveillances were conducted at any location where a void may form, including high points, dead legs, and locations under closed valves in vertical pipes (TI 2515/177, Section 04.03.d.11)
- The licensee ensured that systems were not preconditioned by other procedures that may cause a system to be filled, such as by testing, prior to the void surveillance (TI 2515/177, Section 04.03.d.12)
- Procedures included gas sampling for unexpected void increases if the source of the void is unknown and sampling is needed to assist in determining the source (TI 2515/177, Section 04.03.d.13)

The inspectors verified the following with respect to filling and venting:

- Revisions to fill and vent procedures to address new vents or different venting sequences were acceptably accomplished (TI 2515/177, Section 04.03.e.1)

- Fill and vent procedures provided instructions to modify restoration guidance to address changes in maintenance work scope or to reflect different boundaries from those assumed in the procedure (TI 2515/177, Section 04.03.e.2)

The inspectors verified the following with respect to void control:

- Void removal methods were acceptably addressed by approved procedures (TI 2515/177, Section 04.03.f.1)
- The licensee had reasonably ensured that the low pressure safety injection pump is free of damage following a gas-related event in which pump acceptance criteria was exceeded (TI 2515/177, Section 04.03.f.2)

Specific documents reviewed during this inspection are listed in the attachment.

This inspection effort counts towards the completion of TI 2515/177 which will be closed in a later inspection report.

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

Cornerstone: Occupational and Public Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

This area was inspected to: (1) review and assess licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities and the implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures; (2) verify the licensee is properly identifying and reporting occupational radiation safety cornerstone performance indicators; and (3) identify those performance deficiencies that were reportable as a performance indicator and which may have represented a substantial potential for overexposure of the worker.

The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors performed walkdowns of various portions of the plant, performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation reported by the licensee in the occupational radiation safety cornerstone

- The hazard assessment program, including a review of the license'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: (1) the adequacy of surveys, radiation protection job coverage, and contamination controls; (2) the use of electronic dosimeters in high noise areas; (3) dosimetry placement; (4) airborne radioactivity monitoring; (5) controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools; and (6) 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

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one required sample as defined in Inspection Procedure 71124.01-05.

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

This area was inspected to assess performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel and reviewed the following items:

- 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/postjob 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

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.02-05.

b. Findings

No findings were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

This area was inspected to verify in-plant airborne concentrations are being controlled consistent with ALARA principles, and the use of respiratory protection devices onsite does not pose an undue risk to the wearer. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel, performed walkdowns of various portions of the plant, and reviewed the following items:

- The licensee's use, when applicable, of ventilation systems as part of its engineering controls

- The licensee's respiratory protection program for use, storage, maintenance, and quality assurance of NIOSH certified equipment, qualification and training of personnel, and user performance
- The licensee's capability for refilling and transporting self-contained breathing apparatus air bottles to and from the control room and operations support center during emergency conditions, status of self-contained breathing apparatus staged and ready for use in the plant and associated surveillance records, and personnel qualification and training
- Audits, self-assessments, and corrective action documents related to in-plant airborne radioactivity control and mitigation since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71124.03-05.

b. Findings

No findings were identified.

2RS08 Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

This area was inspected to verify the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 10 CFR Parts 20, 61, and 71 and Department of Transportation regulations contained in 49 CFR Parts 171-180 for determining compliance. The inspectors interviewed licensee personnel and reviewed the following items:

- Control of radioactive waste storage areas including container labeling/markings and monitoring containers for deformation or signs of waste decomposition

This activity does not constitute completion of the one required sample as defined in Inspection Procedure 71124.08-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

Cornerstones: Occupational Radiation Safety, Public Radiation Safety

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the first quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspector's normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator for Palo Verde Units 1, 2, and 3 for the period from the second quarter 2009 through the first quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC integrated inspection reports for the period from the second quarter 2009 through the first quarter 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three safety system functional failures samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index – Emergency AC Power System (MS06)

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – Emergency AC Power System performance indicator for Palo Verde Units 1, 2, and 3 for the period from the second quarter 2009 through the first quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6. The inspectors reviewed the licensee’s operator narrative logs, mitigating systems performance index derivation reports, issue reports, event reports and NRC integrated inspection reports for the period from the second quarter 2009 through the first quarter 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three mitigating systems performance index emergency ac power system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Mitigating Systems Performance Index – High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – High Pressure Injection Systems performance indicator for Palo Verde Units 1, 2, and 3 for the period from the second quarter 2009 through the first quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6. The inspectors reviewed the licensee’s operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports and NRC integrated inspection reports for the period from the second quarter 2009 through the first quarter 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the

performance indicator data collected or transmitted for this indicator and none were identified.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three mitigating systems performance index high pressure injection system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.5 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors reviewed performance indicator data for the first quarter 2010. The objective of the inspection was to determine the accuracy and completeness of the performance indicator data reported during these periods. The inspectors used the definitions and clarifying notes contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, as criteria for determining whether the licensee was in compliance.

The inspectors reviewed corrective action program records associated with high radiation area (greater than 1 R/hr) and very high radiation area non-conformances. The inspectors reviewed radiological controlled area exit transactions greater than 100 millirems. The inspectors also conducted walkdowns of high radiation areas (greater than 1 R/hr) and very high radiation area entrances to determine the adequacy of the controls of these areas.

These activities constitute completion of the occupational exposure control effectiveness sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed performance indicator data for the first quarter 2010. The objective of the inspection was to determine the accuracy and completeness of the performance indicator data reported during these periods. The inspectors used the definitions and clarifying notes contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, as criteria for determining whether the licensee was in compliance.

The inspectors reviewed the licensee's corrective action program records and selected individual annual or special reports to identify potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose.

These activities constitute completion of the radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified

40A2 Identification and Resolution of Problems (71152)

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

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included: (1) the complete and accurate identification of the problem; (2) the timely correction, commensurate with the safety significance; (3) the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and (4) the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of January 1, through June 30, 2010, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included: (1) issues documented outside the normal corrective action program in major equipment problem lists; (2) repetitive and/or rework maintenance lists; (3) departmental problem/challenges lists; (4) system health reports, quality assurance audit/surveillance reports, self-assessment reports; and (5) maintenance rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one semiannual trend review inspection sample as defined in Inspection Procedure 71152-05.

b. Findings and Observations

During the inspectors review, inspectors made observations of a declining trend in the area of human performance. During the sample period, inspectors have discussed with the licensee several issues of concern and minor violations associated with errant human performance. The inspectors observations are also corroborated by the licensee's metrics, which identify several events that have occurred which have

exceeded the licensee's goals for human performance event rate in the sample period. Findings reviewed during the sample period all had crosscutting aspects in the area of human performance, supporting a declining trend. None of the observations associated with this declining trend in the area of human performance warrant an inspection finding or exceed regulatory thresholds. The licensee has been informed of the inspector's observations and is evaluating this trend.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

In addition to the routine review, the inspectors selected the below listed issue for a more in-depth review. The inspectors considered the following during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

- March 7, 2010, Unit 1, catastrophic failure of 1ENANA03 13.8 kV electrical bus

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one in-depth problem identification and resolution samples as defined in Inspection Procedure 71152-05.

b. Findings

Introduction. A Green self-revealing finding was identified for the failure of maintenance personnel to provide adequate procedures and ensure work was performed properly for installation of the ducting for the 13.8 kV bus 1E-NAN-A03 to ensure it was weather tight. Specifically, on March 7, 2010, the 1E-NAN-A03 electrical bus catastrophically failed due to water intrusion from heavy rains caused by improper installation of the ducting in November 2007. This issue was entered into the licensee's corrective action program as Condition Report Disposition Request 344792.

Description. On March 7, 2010, Unit 1 was operating at essentially 100 percent power when the unit experienced an automatic plant trip due to a A phase to ground fault on the 1E-NAN-A03 13.8 kV electrical bus. The plant subsequently tripped, due to a reactor protection signal when power to two reactor coolant pumps was lost. The plant was shut down and cooled down safely with no additional mitigating systems actuation. The licensee determined that the cause of the ground fault was water intrusion into the bus ducting coincident with degraded bus bar insulation. Engineering personnel determined during their root cause evaluation that water was present next to the A phase at the time of the initial fault and the team observed a white residue inside the ducting enclosure indicative of the presence of water. The polymeric insulation is manufactured by Norel who has identified historical degradation issues since 1989,

including a similar failure of the 13.8 kV bus at Unit 1 due to degraded Norel insulation. Over time this insulation would develop cracks, exposing the underlying bus bar material which allows for a potential ground. Palo Verde's corrective actions from that event led to a preventative maintenance program that would inspect and repair degraded Norel insulation.

During their review, the inspectors noted Work Order 2893375 was generated and used at Palo Verde to inspect the 1E-NAN-A03 electrical bus in November of 2007 in accordance with the preventative maintenance program. The inspectors noted that maintenance personnel did not restore the ducting to the required weather tight configuration when finished with this work as indicated by the residual water staining observed in the failed bus ducting. The inspectors also noted this work activity was considered skill of the craft and did not include vendor drawings in the work package which demonstrate how to adequately restore the ducting to a weather tight configuration. During their review, the inspectors determined that maintenance personnel failed to provide adequate instructions to restore the electrical bus ducting properly.

Analysis. The performance deficiency associated with this finding involved failure of maintenance personnel to provide adequate procedures and ensure work was performed properly for installation of the ducting for the 13.8 kV bus 1E-NAN-A03 to ensure it was weather tight. The finding was more than minor because it affected the configuration control attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and mitigating equipment or functions not being available. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee failed to ensure training of personnel was adequate to assure nuclear safety [H.2.(b)].

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirements. Because this finding does not involve a violation of regulations or requirements, has a very low safety significance, and has been entered into the licensee's corrective action program as Condition Report Disposition Request 344792, it is identified as: FIN 05000528/2010003-02, "Failure to Establish Procedures to Restore the Required Configuration of 13.8 kV Electrical Bus Ducting."

4OA3 Event Follow-up (71153)

- .1 Event Follow Up
 - a. Inspection Scope

The inspectors reviewed the below listed event for plant status and mitigating actions to:
(1) collect information necessary to communicate event details to NRC management for

determination of the appropriate agency response; (2) observe plant system parameters and status; (3) evaluate licensee actions; and (4) confirm that the licensee properly classified the event in accordance with emergency action level procedures and made timely notifications to NRC and state/governments, as required.

- March 22, 2010, Unit 1, reactor coolant system leakage results in emergency plan event declaration
- April 4, 2010 and April 8, 2010, Unit 1, 2, and 3, notification of unusual event following earthquake in Baja, Mexico
- June 18, 2010, Unit 1, notification of unusual event declaration due to main transformer C phase fault following deluge system actuation

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three samples as defined in Inspection Procedure 71153-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR 50.47(b)(4) for the failure of operations personnel to adequately implement the emergency plan. Specifically, on March 22, 2010, leakage from the packing of a main pressurizer spray valve at a rate of 12 gpm into the reactor drain tank was incorrectly diagnosed as “unidentified leakage.” This led operations personnel to declare a Notification of Unusual Event when the emergency action thresholds for this emergency classification level had not actually been met. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3484532.

Description. On March 22, 2010, Unit 1 was operating at approximately 93 percent power when at 5:56 p.m. reactor operators identified an upward trend on the reactor drain tank level and temperature. The leak into the reactor drain tank was determined to be between 9-12 gpm. At 6:11 p.m. Technical Specification 3.4.14, Condition A was entered for unidentified leak rate greater than 1 gpm and a Notification of Unusual Event was declared due to unidentified leakage exceeding 10 gpm. Preparations were made to identify the source of the leak in containment and at 8:51 p.m. maintenance personnel entered containment. At 9:07 p.m. the leak was determined to be from the valve packing of the main pressurizer spray valve RCEPV-100E. The valve was isolated and Unit 1 exited Technical Specification 3.4.14, Condition A. The inspectors arrived onsite at approximately 7:00 p.m. and monitored the licensee's activities during this event.

During the weeks that followed, emergency planning personnel reviewed the event and determined that the correct classification was made given the circumstances of the event. Once the emergency planning post event critique was completed and the report was issued to site management, the inspectors began their inspection of this event. Inspectors completed their review of the event and compared the post event critique report to the information in the technical specifications, UFSAR, Palo Verde Nuclear

Generating Station Emergency Plan, and emergency planning implementing Procedure EPIP-99, "EPIP Standard Appendices." During their review, the inspectors noted that following the event operations management issued a site wide communication instructing operations personnel to consider all leakage to the reactor drain tank as identified for classifying future events. The inspectors also noted that the UFSAR, Section 5.2.5.5, stated, in part, that by design, inputs to the reactor drain tank are defined as identified. Additionally, Procedure EPIP-99 stated, in part, that the emergency action thresholds for this emergency classification of reactor coolant system leakage are: unidentified leakage greater than 10 gpm or identified leakage greater than 25 gpm. In this case neither condition was met. The inspectors determined that the Notification of Unusual Event declaration was incorrect.

Through interviews, inspectors identified a generic knowledge weakness of operations personnel in the ability to classify reactor coolant leakage as identified or unidentified leakage. The shift manager misinterpreted a statement in the EPIP Standard Appendices for reactor coolant system leakage regarding relief valves that fail to reseal. The EPIP Standard Appendices basis states, in part, that a relief valve that operates and fails to close per design should be considered applicable to this initiating condition. The shift manager was unsure of the source of the leakage and believed he may have a pressurizer safety valve stuck open. This led the shift manager to believe the initiating condition for this emergency action level had been met based upon unidentified leakage. About half of the senior operators agreed with the shift manager's decision, while the other half disagreed. Inspectors determined that the threshold for the Notification of Unusual Event had not been met since the leakage was into the reactor drain tank and by definition should have been considered as identified leakage.

Analysis. The performance deficiency associated with this finding involved the failure of operations personnel to correctly diagnose reactor coolant leakage, which led to an incorrect classification in the emergency plan. The finding was more than minor because it affected the Emergency Response Organization performance attribute of the Emergency Preparedness cornerstone and affected the cornerstone objective to ensure the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Using Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Sheet 2, the finding was determined to have very low safety significance because the actual event implementation problem was associated with a Notification of Unusual Event. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee failed to ensure training of personnel was adequate to assure proper implementation of the emergency plan [H.2.(b)].

Enforcement. Title 10 CFR Part 50.47(b)(4), "Emergency Plans," states, in part "a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee." "PVNGS Emergency Plan," Revision 43, stated, in part, an emergency shall be classified and declared if the shift manager finds that a specific emergency action level threshold has been reached. Contrary to the above, the licensee declared a Notification of Unusual Event without meeting specific emergency action level threshold criteria.

Specifically, on March 22, 2010, operations personnel misclassified reactor coolant system leakage as “unidentified,” resulting in a declaration of a Notification of Unusual Event when the emergency action level was not actually met. A site wide communication clarifying the definition of identified leakage was considered as an immediate corrective action to restore compliance. 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 3484532, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000528/2010003-03, “Inadequate Emergency Action Level Declaration.”

.2 Event Report Reviews

a. Inspection Scope

The inspectors reviewed the below listed licensee event report and related documents to assess: (1) the accuracy of the licensee event report; (2) the appropriateness of corrective actions; (3) violations of requirements; and (4) generic issues.

b. Findings and Observations

(Closed) Licensee Event Report 05000529/2010-001-00, Essential Chiller B Inoperable Due to Incorrectly Positioned Head Pressure Control Bypass Valve

On January 26, 2010, the Unit 2 Essential Chilled Water System Chiller B (EC B) was declared inoperable due to low condenser pressure. The cause was the refrigerant head pressure control bypass valve was in the locked-open position instead of the required locked-closed position. The valve had been left in the locked-open position following chilled water system pump testing on December 24, 2009. In that configuration, the essential chiller could have tripped on low chiller condenser pressure during operation with low heat loads. Operations restored chiller operability by repositioning the head pressure control bypass valve to the locked-closed position. Inspectors reviewed this issue and documented a Green noncited violation of Technical Specification 5.4.1, “Procedures,” in Section 1R15 of NRC Inspection Report 05000528;529;530/2010002. The licensee documented the valve incorrect positioning in Palo Verde Action Request 3430116 and Condition Report Disposition Request 3431177. Inspectors reviewed the root cause evaluation and the licensee event report and determined that no additional violations of NRC requirements exists. This licensee event report is closed.

40A5 Other Activities

.1 (Open) NRC TI 2515/177, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems (NRC Generic Letter 2008-01)

As documented in Sections 1R04 and 1R22, the inspectors confirmed the acceptability of the described licensee’s actions. This inspection effort counts towards the completion of TI 2515/177 which will be closed in a later inspection report.

.2 (Closed) Temporary Instruction (TI) 2515/179, Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10, Code of Federal Regulations, Part 20.2207 (10 CFR 20.2207)

a. Inspection Scope

An NRC inspection was performed to confirm that the licensee has reported their initial inventories of sealed sources pursuant to 10 CFR 20.2207 and to verify that the National Source Tracking System database correctly reflects the Category 1 and 2 sealed sources in custody of the licensee. Inspectors interviewed personnel and performed the following:

- Reviewed the licensee's source inventory
- Verified the presence of any Category 1 or 2 sources
- Reviewed procedures for and evaluated the effectiveness of storage and handling of sources
- Reviewed documents involving transactions of sources
- Reviewed adequacy of licensee maintenance, posting, and labeling of nationally tracked sources

b. Findings

No findings were identified.

.3 Reactor Vessel Head Replacement Inspection (71007)

a. Inspection Scope

(1) Design and Planning Inspections

The inspectors used the guidance in Inspection Procedure 71007 to perform the following reactor vessel head design and planning inspection activities.

Engineering and Technical Support

Inspections were conducted by resident and regional office-based specialist inspectors to review engineering and technical support activities performed prior to, and during, the reactor vessel head replacement outage. This review verified that selected design changes and modifications to structures, systems, and components described in the UFSAR for transporting the new and old reactor vessel heads were reviewed in accordance with 10 CFR Part 50.59. Additionally, key design aspects and modifications associated with the reactor vessel head replacement were also reviewed. Finally, the inspectors determined if the licensee had confirmed that the existing reactor vessel head

conformed to design requirements and that there were no fabrication deviations from design requirements.

Lifting and Rigging

The inspectors reviewed engineering design, modification, and analysis associated with reactor vessel head lifting and rigging activities. This included: (1) crane and rigging equipment; (2) reactor vessel head component drop analysis; (3) safe load paths; and (4) load laydown areas.

Radiation Protection

The inspectors reviewed radiation protection program controls, planning, and preparation in: (1) ALARA planning; (2) dose estimates and tracking; (3) exposure and contamination controls; (4) radioactive material management; (5) radiological work plans and controls; (6) emergency contingencies; and (7) project staffing and training plans. This review was performed as part of the baseline inspections conducted during the 1R15 outage and additional information is documented in Section 2RS02 of this report.

(2) Reactor Vessel Head Fabrication Inspections at Licensee Facility

The inspectors used the guidance in Inspection Procedure 71007 to perform the following reactor vessel head fabrication inspection activities.

Heat Treatment

The inspectors verified that the material heat treatment used to enhance the mechanical properties of the reactor vessel head material carbon, low alloy, and high alloy chromium steels is conducted per ASME code and approved vendor procedures consistent with the applicable ASME Code, Section III, requirements. Also, inspections were performed to verify that adequate heat treatment procedures were available to assure that requirements associated with the following areas were met: (1) furnace atmosphere; (2) furnace temperature distribution and calibration of measuring and recording devices; (3) thermocouple installation; (4) heating and cooling rates; (5) quenching methods; and (6) record and documentation requirements.

Nondestructive Examination (NDE)

Inspections were conducted to ensure the manufacturing control plan included provisions for monitoring NDE to ascertain that the NDE was performed in accordance with applicable code, material specification, and contract requirements.

Welding

The inspectors reviewed the documentation for the weld overlay welding operations that established a layer of stainless steel cladding on the inside of the reactor vessel head to determine if it was accomplished per design. The inspectors also selected a sample of dome-to-flange and control rod drive mechanism flange-to-nozzle welds and reviewed the following items: (1) certified mill test reports of the dome, flange, weld material rods,

and control rod drive mechanism nozzles; (2) certified mill test reports for the welding material for the reactor vessel head cladding; (3) cladding weld records, weld rod material control requisitions, traceability of weld material rods, weld procedure qualification, welder qualifications, and nonconformance reports; (4) control rod drive mechanism nozzle cladding welding inspection records, weld rod material control requisitions, traceability of weld material rods, weld procedure qualification, welder qualifications, and nonconformance reports; (5) control rod drive mechanism to nozzle welding and welds inspection records, weld rod material control requisitions, traceability of weld material rods, weld procedure qualification, welder qualifications, and nonconformance reports; and (6) NDE procedures, NDE records of the welds, NDE personnel qualifications, and certification of the NDE solvents.

Procedures

Inspections were completed to ensure that repair procedures had been established and that these procedures were consistent with applicable ASME code, material specification, and contract requirements by verifying: (1) repair welding was conducted in accordance with procedures qualified to Section IX of the ASME code; (2) all welders had been qualified in accordance with Section IX of the ASME code; (3) records of the repair were maintained; and (4) that requirements had been established for the preparation of certified material test reports and that the records of all required examinations and tests were traceable to the procedures to which they were performed.

Code Reconciliation

The inspectors reviewed the required documentation, supplemental examinations, analysis, and ASME code documentation reconciliation to ensure that the original ASME code N-Stamp remains valid, and that the replacement head complies with appropriate NRC rules and industry requirements. The inspectors also ensured that the design specification was reconciled and a design report was prepared for the reconciliation of the replacement head, verifying that they were certified by professional engineers competent in ASME code requirements.

Quality Assurance Program

Inspections were conducted to ensure that: (1) machining was carried out under a controlled system of operation; (2) a drawing/document control system was in use in the manufacturing process; and (3) part identification and traceability was maintained throughout processing and was consistent with the manufacturer's quality assurance program. In addition, the inspectors ensured that only the specified drawing and document revisions were available on the shop floor and were being used for fabrication, machining, and inspection.

Compliance Inspection

The inspectors verified that the original ASME Code, Section III, data packages for the replacement reactor vessel head were supplemented by documents included in the ASME Code, Section XI, (pre-service inspection) data packages; examined selected

manufacturing and inspection records of the finished machined reactor vessel head; and verified compliance with applicable documentation requirements.

(3) Reactor Vessel Head Removal and Replacement Inspections

The inspectors used the guidance in Inspection Procedure 71007 to perform the following reactor vessel head removal and replacement inspection activities:

Lifting and Rigging

The inspectors reviewed preparations and procedures for rigging and heavy lifting including crane and rigging inspections, testing, equipment modifications, laydown area preparations, and training for the following activities:

- Area preparation for the outside systems
- Lattice boom crawler crane assembly, disassembly, and operation
- Hydraulic gantry lift system
- Outside bridge and trolley transfer system
- Elevated cantilevered handling device installation and use
- Reactor vessel head lift rig and polar crane
- Downender/upender fixture
- Old reactor vessel head removal
- New reactor vessel head placement
- Transport of old reactor vessel head to storage location

Major Structural Modifications

The inspectors observed that there were no major structural modifications that were made to facilitate reactor vessel head replacement.

Containment Access and Integrity

The inspectors observed there were no modifications to the existing containment access structure or integrity to allow for the reactor vessel head to be removed and installed. The new and old reactor vessel head were moved in and out of containment using the existing equipment hatch.

Outage Operating Conditions

The inspectors reviewed and observed the establishment of operating conditions including: (1) defueling; (2) reactor coolant system draindown; (3) system isolation; (4) safety tagging; (5) radiation protection controls; (6) controls for excluding foreign materials in the reactor vessel; (7) verification of the suitability of reinstalled (reused) components for use; and (8) the installation, use, and removal of temporary services. Section 1R20 of this report documents additional activities that were performed during the outage.

Storage of Removed Reactor Vessel Head

The inspectors reviewed the radiological safety plans and observed the transport, storage, and radiological surveys of the old reactor vessel head to its onsite storage location. This review was performed as part of the baseline inspections conducted during the 1R15 outage and additional information is documented in Section 2RS02 of this report.

(4) Reactor Vessel Head Post Installation Verification and Testing Inspections

The inspectors used the guidance in Inspection Procedure 71007 to perform the following post installation verification and testing inspection activities. Selective inspections were performed of the following areas: (1) containment testing; (2) licensee's post installation inspections and verifications program and its implementation; (3) reactor coolant system leakage testing and review of test results; (4) procedures required for equipment performance testing to confirm the design and to establish baseline measurements; and (5) preservice inspection of new welds.

b. Findings

No findings were identified.

.4 (Closed) URI 05000530/2010002-04, Discrepancy with Unplanned Scrams with Complications NRC Performance Indicator

The inspectors identified an unresolved item associated with a difference in the interpretation of NEI 99-02 guidance for Unplanned Scrams with Complications NRC performance indicator during the inspection period covered by Inspection Report 2010002. On December 3, 2009, Unit 3 manually initiated a reactor trip due to a loss of instrument air to containment. During this event the licensee entered two emergency operating Procedures 40EP-9EO01, "Standard Post Trip Actions" and 40EP-9EO07, "Loss of Offsite Power/Loss of Forced Circulation," due to the loss of forced circulation, associated with the loss of instrument air casualty, and due to the inability to complete the standard post-trip action acceptance criteria in emergency operating Procedure 40EP-9EO01. The guidance in NEI 99-02 provides criteria for determining if a scram was complicated. To be counted as uncomplicated, the scram must be completed without transitioning to an additional emergency operating procedure after entering the scram response procedure. However, the licensee did not submit data for the Unplanned Scrams with Complications NRC performance indicator in accordance with NEI 99 02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The licensee determined the scram was uncomplicated based on Palo Verde adopting a Westinghouse emergency operating procedure scheme. The licensee stated that for this sequence of events in a Westinghouse emergency operating procedure scheme, it would not transfer into another emergency operating procedure and would not count toward the Unplanned Scrams with Complications NRC performance indicator.

This discrepancy in the interpretation of NEI 99-02 guidance was addressed by the frequently asked questions process as defined by Inspection Procedure 71151,

“Performance Indicator Verification.” It was determined that Palo Verde Nuclear Generating Station should report the event as an Unplanned Scrams with Complications for NRC performance indicator. The licensee will submit this Unplanned Scrams with Complications NRC performance indicator to reflect this decision and inspectors will verify the licensee’s action. These actions are sufficient to close this unresolved item.

.5 Temporary Instruction 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (Closed for Units 1 and 2)

Temporary Instruction 2515/172 was performed at Palo Verde, Unit 1 during refueling outages 1R14 and 1R15 and Unit 2 during refueling outages 2R14 and 2R15. The results of those inspections are documented in Inspection Reports 05000528/2008005, 05000529/2008003 and 05000529/2009005 for Units 1 and 2, respectively.

a. Inspection Scope

Portions of Temporary Instruction 2515/172 were performed at Palo Verde, Unit 1, during refueling outage 1R15. Specific documents reviewed during this inspection are listed in the attachment. This unit has the following dissimilar metal butt welds.

- Two 12-inch pressurizer surge line nozzles, one each on the pressurizer and hot leg sides, were mitigated during refueling outage 1R13 using a weld overlay process. Both were categorized as Category F following the weld overlay process.
- Four 8-inch pressurizer safety nozzles were mitigated during refueling outage 1R13 using a weld overlay process. All were categorized as Category F after the weld overlay.
- Two 16-inch shutdown cooling nozzles were mitigated during refueling outage 1R14 using a weld overlay process. Both were categorized as Category F after the weld overlay.
- Four 14-inch safety injection nozzles had ultrasonic examinations during refueling outage 1R15. All were categorized as Category E.
- One 4-inch pressurizer spray nozzle was mitigated using a weld overlay process during refueling outage 1R13, and was categorized as Category F. Two 3-inch pressurizer spray nozzles had bare metal visual examinations during refueling outage 1R15. No mitigation was performed and both are categorized as Category K.
- Three 2-inch drain line nozzles had bare metal visual examinations during refueling outage 1R15. No mitigation was performed and both were categorized as Category K.

- Two additional 2-inch line nozzles, one for letdown and one for charging, had bare metal visual examinations during refueling outage 1R15. No mitigation was performed and both were categorized as Category K.

Licensee's Implementation of the Materials Reliability Program (MRP-139) Baseline Inspections (03.01)

- a. MRP-139 baseline inspections:

The inspectors reviewed records of nondestructive examination activities associated with the licensee's cold leg baseline inspections. The baseline inspections of the pressurizer dissimilar metal butt welds were completed during the spring 2007 refueling outage 1R13. The baseline inspections associated with the hot leg dissimilar metal butt welds were completed during the fall 2008 refueling outage 1R14.

- b. The licensee did not take any deviations from the baseline inspection requirements of MRP-139, and all other applicable dissimilar metal butt welds were scheduled in accordance with MRP-139 guidelines.

Volumetric Examinations (03.02)

- a. The inspectors reviewed the records of four volumetric examinations performed on the cold leg safety injection nozzles. The inspectors concluded that the ultrasonic examination for these welds was performed in accordance with the ASME Code, Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," requirements regarding personnel, procedures, and equipment qualifications. No relevant conditions were identified during these examinations.
- b. The inspectors reviewed the nondestructive evaluations performed on the four cold leg safety injection nozzles. The inspection coverage met the requirements of MRP-139 and no relevant conditions were identified.
- c. The certification records of examination personnel were reviewed for those personnel that performed the volumetric examinations of the cold leg safety injection nozzles. All personnel records showed that they were qualified under the Electric Power Research Institute Performance Demonstration Initiative.
- d. No deficiencies were identified during the nondestructive evaluations.

Weld Overlays (03.03)

The licensee performed all weld overlays during previous outages (see NRC Inspection Reports 05000528/2008005, 05000529/2008003, and 05000529/2009005).

Mechanical Stress Improvement (03.04)

The licensee did not employ a mechanical stress improvement process.

Inservice Inspection Program (03.05)

The licensee has prepared an MRP-139 inservice inspection program. All the welds in the MRP-139 inservice inspection program were appropriately categorized in accordance with MRP-139 guidelines. In addition to the volumetric examinations the licensee performed a bare metal surface exam of seven welds with less than 4-inch nominal pipe size exposed to cold leg temperature. These welds are included in the inspection scope section of this report. The inspectors reviewed the records of four of the welds and no relevant conditions were identified.

As a result of the licensee's submittal of Relief Request No. 36, "Alternatives to weld overlay requirements for inservice inspection," Palo Verde Units 1, 2, and 3 committed to ultrasonically examining all weld overlays in the MRP-139 program during the first or second refueling outage following its application. This commitment reduced the reexamination schedule required by MRP-139 examination tables. These welds were ultrasonically examined during refueling outage 1R15. The inspectors reviewed the results of the two 16-inch shutdown cooling nozzles with no relevant conditions identified.

b. Findings

No findings were identified.

40A6 Meetings

Exit Meeting Summary

On April 15, 2010, the inspectors presented the inspection results of the review of inservice inspection activities to Mr. J. Cadogan, Director of Nuclear Engineering Design and Technical Services, and other members of the licensee staff. The licensee acknowledged the issues presented. All proprietary information was disposed of upon completion of the inspection.

On April 23, 2010, the inspectors presented the radiation safety inspection results to Mr. R. Bement, Vice President, Nuclear Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On July 6, 2010, the resident inspectors presented the inspection results to Mr. R. Bement, Vice President, Nuclear Operations, and other members of his staff who acknowledged the findings. The licensee acknowledged the issues presented. All proprietary information was examined and returned or destroyed following the inspection.

40A7 Licensee-Identified Violations

None

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

R. Bement, Vice President, Nuclear Operations
T. Dickerson, Radiological Engineer
J. Gaffney, Director, Radiation Protection
T. Gray, Support Services Department Leader, Radiation Protection
D. Hautala, Senior Engineer, Regulatory Affairs
J. McDonnell, Radiological Services Department Leader, Radiation Protection
M. Wagner, Planning/ALARA Section Leader, Radiation Protection
M. White, Fire Protection Specialist
T. Weber, Department Leader, Regulatory Affairs
J. McDonnell, Department Leader, Radiation Protection
K. Chavet, Compliance
J. Cadogan, Director of Nuclear Engineering Design and Technical Services
M. Webb, Section Leader, Compliance
R. Barnes, Director, Regulatory Affairs
B. Haley, ISI Supervisor
D. Steinsiek, Programs Engineering Department Leader
D. Hansen, ISI
E. Dutton, Director Nuclear Assurance
W. Hezzel, Operations Director
L. Contopasso, Plant Manager

NRC Personnel

G. Repogle, Senior Reactor Analyst, Region IV

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000528/2010003-01	NCV	Inadequate Postmaintenance Test Results with an Inoperable Containment (Section 1R12)
05000528/2010003-02	FIN	Failure to Establish Procedures to Restore the Required Configuration of 13.8 kV Electrical Bus Ducting (Section 4OA2)
05000528/2010003-03	NCV	Inadequate Emergency Action Level Declaration (Section 4OA3)

Closed

- 05000529/2010-001-00 LER Essential Chiller B Inoperable Due to Incorrectly Positioned Head Pressure Control Bypass Valve (Section 4OA3)
- TI 2515/179 Temporary Instruction (TI) 2515/179 - Verification of Licensee Responses to NRC Requirement for Inventories of Materials Tracked in the National Source Tracking System Pursuant to Title 10 Code of Federal Regulations Part 20.2207 (10 CFR 20.2207) (Section 4OA5)
- 05000530/2010002-04 URI Discrepancy with Unplanned Scrams with Complications NRC Performance Indicator (Section 4OA5)
- TI 2515/172 Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (Units 1 and 2) (Section 4OA5)

Discussed

- TI 2515/177 Temporary Instruction (TI) 2515/177, Managing gas accumulation in emergency core cooling, decay heat removal, and containment spray systems (Sections 1R04, 1R22, and 4OA5)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40OP-9NA03	13.8 kV Electrical System (NA)	32
40OP-9PB01	4.16 kV Class 1E Power (PB)	24
40ST-9PB01	Class 1E Power Supply Transfer	2
40OP-9NB01	4.16 Non-Class 1E Power (NB)	23
40DP-9OP34	Switchyard Administrative Control	19
40OP-9ZZ19	Hot Weather Protection	4

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Administrative Agreement for the North American Electric Reliability Corporation Reliability Standard NUC-001: Nuclear Interface Coordination Between the Arizona Public Service Company, as the Palo Verde Nuclear Generating Station Nuclear Plant Generator Operator and the Salt River Project Agriculture Improvement and Power District, as the Arizona Nuclear Power Project High Voltage Switchyard Operating Agent/Transmission Operator	
	Federal Energy Regulation Commission (FERC) Nuclear Plant Interface Coordination NUC-001 Nuclear Plant Interface Requirements (NPIRs)	0
	Unit 2 Control Room Log	March 16, 2010
	Unit 2 Control Room Log	March 19, 2010

Section 1R04: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40OP-9AF01	Essential Auxiliary Feedwater System	50
40ST-9AF08	Auxiliary Feedwater Pump AFB-P01 Monthly Valve Alignment	4
40OP-9SI02	Recovery from Shutdown Cooling to Normal Operating line-up	87
40OP-9PB01	4.16kV Class 1E Power (PB)	24

40OP-9NB01	4.16kV Non Class 1E Power (NB)	24
40ST-9ZZ05	Weekly Electrical Distribution Checks	13

WORK ORDERS

3218785 3389979 3431220 3307413

CONDITION REPORTS ACTION ITEMS

3351666

PERMITS

172793 172786 172791 175346

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-AFP-001	P & I Diagram Auxiliary Feedwater System	37
01-M-SGP-002	P & I Diagram Main Steam System	47
01-M-SGP-001	P & I Diagram Main Steam System	63
13-E-MAA-001	Main Single Line Diagram	23

Section 1R05: Fire Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
14AC-0FP05	Pre-Fire Strategies Manual Control	21

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Updated Final Safety Analysis Report Section 9.5	11

Section 1R06: Flood Protection Measures

PALO VERDE ACTION REQUESTS

3426942	3478623	3478343	3478341	3450889	3197703	3452170
3452178	3454692	3426968	3466866	3456530	3453257	

CONDITION REPORTS / DISPOSITION REQUESTS

3292381	3126014	3126014
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DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-MC-ZA-0809	As Built Auxiliary Building Flooding Calculation	

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>DATE</u>
Radioactive Waste Drains System Maintenance Rule Performance Criteria	December 29, 2009
Radioactive Waste Drains System Health Report	July 1 through December 31, 2009

Section 1R08: Inservice Inspection Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73TI-9RC01	Steam Generator Eddy Current Examinations	28
81DP-9RC01	PVNGS Steam Generator Management Program	10
MRS-SSP-1624-CVER1/CVER2/CVER3	Steam Generator Sludge Removal & FOSAR for Palo Verde Nuclear Generating Stations Units 1, 2, and 3	1
MRS-GEN-1214	Steam Generator Channel Head Video Inspection	2
DS-ECT-02	Procedure for ECT Acquisition of RVH	5
DS-ECT-03	ECT Analysis Procedure of RVH Penetration and J-Groove Weld	4
DS-UT-01	Ultrasonic Acquisition Procedure for RVH Penetrations	5
DS-UT-02	UT Analysis Procedure of RVH Penetrations	5
PP-NDE-013	NDE Program Plan	3
EPPU0311	Ultrasonic and Eddy Current Acquisition Procedure of RVH Vent Nozzle	0
EPPU0301	Procedure for Ultrasonic Examination of Cladding Area	0
EPPP0301	Procedure for Liquid Penetrant Examination	0
EPPP0302	Procedure for Liquid Penetrant Examination	0

500297092	Quality Verification Documentation for Replacement Reactor Vessel Closure Head and Control Element Drive Mechanisms, Volume 7	0
N-7784-30	Ultrasonic Examination Procedure for Head Forging	0
QN-200	Quality Assurance Manual for ASME III and KEPIC-MN & SN Construction and Material Organization Applications	13
DS-ME-06-3	Design Specifications	5
SI-UT-130	Procedure for the Phase Array Ultrasonic Examination of Dissimilar Metal Welds	3
73TI-9ZZ80	ASME Section XI Appendix VIII Ultrasonic Examination of Austenetic Piping	6
73TI-9ZZ07	Liquid Penetrant Examinations	14
73DP-9ZC01	Boric Acid Corrosion Control Program	3
70TI-9ZC01	Boric Acid Walkdown Leak Detection	9
73DP-9WP04	Welding and Brazing Control	13
73DP-9WP05	Weld Filler Material Control	6
73DP-9WP01	Welder and Procedure Qualification	5
PDI-UT-8	General Procedure for Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds	F
73TI-9ZZ22	Visual Examination for Leakage – Interval 3	4
73TI-0ZZ13	Radiographic Examinations	16

PALO VERDE ACTION REQUESTS

3450872 3379616

CONDITION REPORTS / DISPOSITION REQUESTS

3370020 3272816 3377080 3452749

NDE REPORTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
10-UT-1103	Reactor Coolant Pump 2A Cold leg Safety Injection Nozzle	April 13, 2010
10-UT-1101	Reactor Coolant Pump 1A Cold leg Safety Injection Nozzle	April 14, 2010
10-UT-1104	Reactor Coolant Pump 2B Cold leg Safety Injection Nozzle	April 12, 2010
10-UT-1102	Reactor Coolant Pump 1B Cold leg Safety Injection Nozzle	April 12, 2010

NON-CONFORMANCE REPORTS

100187 090072 080083 090771

WORK ORDERS

0203370736 3370738 2967801 2967804 3370736 3404029

50.59 EVALUATIONS

E-09-0007 E-09-0008

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
3139194	Palo Verde Nuclear Generating Station Inservice Inspection (ISI) Self-Assessment	
3194996	Palo Verde Nuclear Generating Station NEI 03-08 Material Initiative Program Self Assessment	September 2008
3139187	Palo Verde Nuclear Generating Station Steam Generator Management Program Self Assessment Report	
	Alloy 600 Management Program Plan	
	Relief Requests Nos. 36 and 37 Re: Alternatives to Weld Overlay Requirements for Inservice Inspection	June 21, 2007

Section 1R11: Licensed Operator Requalification Program

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>DATE</u>
Licensed Operator Continuing Training Simulator Evaluation Scenario SES-0-09-AD-03, LOOP/HPCS Leak/FRP/MVAC-2	February 10, 2010
Simulator Evaluation Summary Sheet, Crew 15, Cycle NLR2103	May 25, 2010
Crew Critique Form	May 25, 2010
Form EP-0541, Palo Verde NAN Emergency Message Form	May 25, 2010
Simulator Setup Evaluation Checklist	May 25, 2010

Section 1R12: Maintenance Effectiveness

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70DP-0RA01	Shutdown Risk Assessments	33
40DP-9OP29	Power Block Permit and Tagging	39
51DP-9OM09	Outage Planning and Implementation	11
40DP-9WP01	Operations Processing of Work Orders	17
AC-0241	Maintenance Work Order and Process Control	1
AC-0203	Conduct of Maintenance	1
70DP-0MR01	Maintenance Rule	29

PALO VERDE ACTION REQUESTS

3478220	3473278	3474072	3453840	3236811	3473253	3214269
3121306	3122166	3143882	3144720	3182530	3183282	3203493
3228985	3246574	3248950	3252178	3266674	3271257	3276353
3337724	3344761	3353915	3369123	3372676	3394371	3419487
3436215	3439589	3453287	3455395	3470650	3471441	3473281
3472515	3470927	3455627				

CONDITION REPORTS / DISPOSITION REQUESTS

3436647	3122278	3122508	3144912	3145113	3184855	3184926
3206058	3215174	3230143	3248917	3251539	3253537	3266848
3272367	3278032	3338918	3346271	3354645	3370417	3373374
3395107	3419774	3436647	3440326	3453723	3456286	3471196
3471895						

WORK ORDERS

3236860 3327255 3321145 3183314 3315288 3315853 3438532
3453583 3472267 3471291 3455397

PERMITS

172291 173268

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Technical Specification 3.9.3	
	Unit 1 Control Room Logs	May 1–10, 2010
NUMARC 93-01	Nuclear Energy Institute - Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants	2
	System Health Report – SG-Main Steam	July 31 – December 31, 2009
	SG-Main Steam PVNGS Maintenance Rule System Basis	5
	SG-MSIV PVNGS – Maintenance Rule Unavailability Performance Re	June 3, 2010
	SG-Main Steam Isolation Valve (MSIV) Reliability Performance Criteria	
	Apparent Cause Evaluation (ACE) Report for CRDR 3436647, Failure of 2JSGEUV0180 (Train B) to Re-Open During Partial Stroke Testing	1

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70DP-0RA05	Assessment and Management of Risk When performing Maintenance in Modes 1 and 2	15
70DP-0RA01	Shutdown Risk Assessments	33
40DP-9OP29	Power Block Permit and Tagging	39
51DP-9OM09	Outage Planning and Implementation	11
40DP-9WP01	Operations Processing of Work Orders	17
AC-0241	Maintenance Work Order and Process Control	1
AC-0203	Conduct of Maintenance	1
40ST-9DG02	Emergency Diesel Generator Surveillance Test Train B	43
40OP-9DG02	Diesel Generator Test Train B	59
43ST-3ZZ02	Inoperable Power Sources Action Statement	39
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	14
70DP-0RA04	Component Risk Significance Determination	2

PALO VERDE ACTION REQUESTS

3466541 3457322 3469860 3456334 3457175 3443947 3446774

3451167 3447542 3448292 3478220 3473278 3474072 3453840
3236811 3473253 3475479 3469072 3472067

CONDITION REPORTS / DISPOSITION REQUESTS

3449504 3448884 3447699

WORK ORDERS

3236860 3327255 3321145 3469737

PERMITS

172291 173268

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Technical Specification 3.9.3	
	Unit 1 Control Room Logs	May 1–10, 2010
	Unit 3 control room operator logs	May 13, 2010
	Scheduler's Risk Evaluation for PV Unit 2	Week of May 3, 2010
	Work week schedule for PV Unit 2	Week of May 3, 2010

Section 1R15: Operability Evaluations

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40DP-9OP26	Operability Determination and Functional Assessment	28

40AO-9ZZ24	Deliberate Acts Against PVNGS	22
40DP-9OP26	Operations PVAR Processing and Operability Determination / Functional Assessment	27

PALO VERDE ACTION REQUESTS

3130618 3430316 3455356 3440431 3465694 346583 3425767

CONDITION REPORTS / DISPOSITION REQUESTS

3431043 2784074

CONDITION REPORTS ACTION ITEMS

3431044 2812309

ENGINEERING EVALUATIONS

3454639

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
3PSIAV458	Shutdown Heat Exchanger A Outlet to Fuel Pool Isolation Valve Component Data Sheet	February 14, 1990
	Essential Cooling Water Cooper Trends for Units 1, 2 and 3	2000 – 2010
	Essential Cooling Water Cooper Trends for Unit 3	2006 – 2010

Section 1R18: Plant Modifications

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
81DP-0DC17	Temporary Modification Control	26
31MT-9ZC05	Open/Close Containment Equipment Access Hatch and Missile Shield Doors	22

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-SIP-0001	P&I Diagram Safety Injection and Shutdown Cooling System	46

PALO VERDE ACTION REQUESTS

3476409 3455216

CONDITION REPORTS / DISPOSITION REQUESTS

3197022 2726509 3390784

CONDITION REPORTS ACTION ITEMS

2785293 2785378 3405839 3403416

WORK ORDERS

2779260 2779269 3321030

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-JC-ZZ-0201	MOV Thrust, Torque, and Actuator Sizing	15
13-JC-MO-0204	89-10 Program Valve Spring Pack Maximum Displacement	10
13-NC-SI-0200	Post LOCA ESF Leakage	2
13-CC-ZA-0045	Auxiliary Building Structural Steel	10
13-JN-SI-1015	Motor Operated Replacement Valve Assembles for SI-673 and SI-675, A,B, Train SDC suction Valves from Containment Recirc Sump and SI-674 and SI-676, CNTMT Sump to SI train A,B Containment Isolation Valves	2
13-MC-SI-0220	Containment Spray System Hydraulic Analysis and Pump Surveillance Testing Requirements	5
01-MC-SI-0501	ESF Pump Suction Lines Train A	6
01-MC-SI-0502	ESF Pump Suction Lines Train B	7

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Units 1, 2, and 3 Night Order for Containment Coordinator Turnover Communications Expectations	April 10, 2010

Section 1R19: Postmaintenance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01DP-9ZZ01	Systematic Troubleshooting	6
73ST-9SG01	Main Steam Isolation Valves – Inservice Test	34
73ST-9AF02	AFA-P01 Recirc Flow – Inservice Test	49
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	15
30DP-9MP01	Conduct of Maintenance	39
73ST-9SG01-2	Main Steam Isolation Valves – Inservice Test	34
30DP-9MP03	System Cleanliness and Foreign Material Exclusion Controls	39
73ST-9XI01	SG # 1 Containment Isolation Valves – Inservice Test	42
73ST-9XI02	SG # 2 Containment Isolation Valves – Inservice Test	46

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
02-E-SGB-0002	Elementary Diagram Main Steam System Steam Gen 2 To Aux FDW Pump A Steam Supply Valve 2J-SGA-UV-138 & 2J-SGA-UV-138A, Sheets 1 & 2	17
02-E-SGF-0002	Control Wiring Diagram Main Steam System Steam Gen 2 To Aux FDW Pump A Steam Supply Valve 2J-SGA-UV-138 & 2J-SGA-UV-138A, Sheets 1 through 4	8

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-E-SGB-012	Elementary Diagram Main Steam System Steam Traps Isolation Valves SGA-UV-1133 & SGA-UV-1134	6
13-10407-E-022-154	Wiring Diagrams E-ZAA-C005	F
13-10407 -E-022-155	Wiring Diagram E-ZAA-C005	D

PALO VERDE ACTION REQUESTS

3479543 3470927 3471441 3470650 3455383 3455627 3455395

CONDITION REPORTS / DISPOSITION REQUESTS

3480458 3471196

CONDITION REPORTS ACTION ITEM

3480459 3480460 3471197 3351666

WORK ORDERS

3479544 3299826 3470661 3299808 3471291 3205520 3205521
3472542 3307285 3453583 3218785 3389979 3431220

PERMITS

172793 172786 172791

MISCELLANEOUS

<u>TITLE</u>	<u>REVISION / DATE</u>
Non-Intrusive/Intrusive Inspection Form, Appendix E of procedure 01DP-9ZZ01, Systematic Troubleshooting	May 24, 2010
PVNGS Operator Information Manual March 2010	1
Unit 2 MSIV 181 "A" Train Exercise Stroke Summary of Findings	
Determination /Retermination Sheet for relay SGX12 in 1EZAAC005	June 23, 2010
Determination /Retermination Sheet for relay SGX13 in 1EZAAC005	June 23, 2010
Technical Specification 3.7.2, Main Steam Isolation Valves	40

Section 1R20: Refueling and Other Outage Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40OP-9ZZ11	Mode Change Checklist	81
73ST-9CL03	Containment Airlock Door Seal Leak Test	22
73ST-9CL04	Personnel Airlock Interlock Test	12
31MT-9ZC05	Open/Close Containment Equipment Access Hatch and Missile Shield Doors	22

PALO VERDE ACTION REQUESTS

3454799 3472373 3472282 3456097 3455758 3466809 3466847

3468632	3470319	3469077	3470255	3470779	3470604	3471407
3471369	3471306	3469109	3469458	3469455	3469424	3469137
3469333	3471093	3456177	3478899	3476445	3475938	3476251
3455216						

CONDITION REPORTS / DISPOSITION REQUESTS

3390784

WORK ORDERS

3478019	3475488	3336679	3475487	3336683
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PERMITS

170197	169878	172504
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MISCELLANEOUS

<u>TITLE</u>	<u>DATE</u>
Irradiated Fuel Movement Checklist, Appendix M of procedure 40OP-9ZZ11, Mode Change Checklist	April 28-29, 2010
Complete Core Offload Condition to Mode 6 Checklist, Appendix A of Procedure 40OP-9ZZ11, Mode Change Checklist	April 28-29, 2010
Shutdown Safety Function Assessment, Reactor Vessel Head Off	April 29, 2010
Prompt Human Performance Evaluation	April 6, 2010

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73ST-9SG01	Main Steam Isolation Valves – Inservice Test	34
40ST-9SI13	LPSI and CS Alignment Verification	20
73TI-0ZZ02	Ultrasonic Thickness Measurement	10
73ST-9XI04	SI Train B Valves – Inservice Test	27
40AL-9GT01	Station Blackout Generator Alarm Response	28
40OP-9GT02	Station Blackout Generator Operational Test	4
73ST-9XI01	SG # 1 Containment Isolation Valves – Inservice Test	42
73ST-9XI02	SG # 2 Containment Isolation Valves – Inservice Test	46

PALO VERDE ACTION REQUESTS

3450267	3440886	3450076	3456753	3451636	3466931	3478789
3476424	3427804	3430142	3440155	3447082		

ACTION ITEMS

3314957

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
E-14373-311-023	Safety Injection System LPSI & CS Discharge, Unit 2 – Train B	0

02-M-SIP-001	P & I Diagram Safety Injection and Shutdown Cooling System	40
02-M-SIP-002	P & I Diagram Safety Injection and Shutdown Cooling System	29
01-E-SGB-012	Elementary Diagram Main Steam System Steam Traps Isolation Valves SGA-UV-1133 & SGA-UV-1134	6
13-10407-E-022-154	Wiring Diagrams E-ZAA-C005	F
13-10407 -E-022-155	Wiring Diagram E-ZAA-C005	D

WORK ORDERS

3284387	3284341	3201597	3201598	3424637	3217667	3253936
3271767	3451777	3307441	3205520	3205521	3472542	3307285

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-MC-SI-0215	HPSI System Performance Evaluation and System Report Losses Calculation	4
13-MC-SI-0240	Low Pressure Safety Injection Hydraulic Analysis and System Surveillance Calculation	0
13-MC-SI-0220	Containment Spray System Hydraulic Analysis and Pump Surveillance	5

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	PVNGS Operator Information Manual March 2010	1
10-202	Ultrasonic Thickness Examination Report	April 13, 2010
10-313	Ultrasonic Thickness Examination Report	April 21, 2010
10-330	Ultrasonic Thickness Examination Report	April 21, 2010
10-414	Ultrasonic Thickness Examination Report	April 27, 2010
	Unit 2 Control Room Logs	April 13, 2010
	Engineering Document Change (EDC) form 2009-0239	April 17, 2010
	Impact Review Form for EDC 2009-0239/A	April 17, 2010
	Design Input Requirements Checklist for EDC 2009-0239	April 21, 2010
	Temporary Approved Procedure Action (TAPA)	May 11, 2010
	Temporary Approved Procedure Action (TAPA)	April 20, 2010
	Surveillance Test Log for 73ST-9XI04	June 8, 2010
	Determination /Retermination Sheet for relay SGX12 in 1EZAAC005	June 23, 2010
	Determination /Retermination Sheet for relay SGX13 in 1EZAAC005	June 23, 2010

Section 2RS01: Radiological Hazard Assessment and Exposure Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75DP-0RP02	Radioactive Contamination Control	15
75DP-9RP01	Radiation Exposure and Access Control	17
75RP-0RP01	Radiological Posting and Labeling	29
75RP-0RP02	Radiological Survey Schedule	8
75RP-9RP10	Conduct of Radiation Protection Operations	30

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
2008-012	Radiation Protection Audit Report	November 18, 2008

CONDITION REPORTS / DISPOSITION REQUESTS

3399460 3403355 3406705 3408378 3430397

RADIATION EXPOSURE PERMITS

<u>NUMBER</u>	<u>TITLE</u>
1-3306	Primary Side Steam Generator Maintenance
1-3302	Valve Maintenance
1-3503	General Tours, Inspections and Job Planning Walkdowns
1-3514	Routine Outage Radiological Material Control

Section 2RS02: Occupational ALARA Planning and Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75RP-0RP03	ALARA Program Overview	4
75RP-9RP02	Radiation Exposure Permits	25

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
2008-012	Radiation Protection Audit Report	November 18, 2008

ALARA PLANS

<u>NUMBER</u>	<u>TITLE</u>
1-1433	Prepare Old Reactor Vessel Closure Interfaces, Commodities, and Materials for Removal
1-1434	Prepare Old Reactor Vessel Closure Head for Long Term Storage
1-1435	Prep and Move Replacement Reactor Vessel Closure Head
1-1439	Move the Old Reactor Vessel Closure Head out of Containment and Transport to ORVCHSF

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>DATE</u>
U2R15 ALARA Slideshow	
A-25	Attachment

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

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
75DP-0RP05	Control of Portable and Temporary Air Filtration Systems	5
75DP-0RP07	Radiological Surveys and Air Sampling	19
16DP-OEP30	Emergency Planning Administration	2
01DP-0IS08	Respiratory Protection Equipment Usage	15

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
EHS-APS-08-720	Non-Radiological Respiratory Protection Program	December 19, 2008

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>DATE</u>
Respiratory Equipment Use Form	April, 2010
Air Quality Test Logs	October 5, 2009
Air Quality Test Logs	March 9, 2010
Air Quality Test Logs	April 6, 2010

Section 40A1: Performance Indicator Verification

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70DP-0PI01	Performance Indicator Data Mitigating Systems Cornerstone	5
93DP-0LC09	Data Collection and Submittal Using INPO's Consolidated Entry System	10

CONDITION REPORTS / DISPOSITION REQUESTS

3317532 3308679 3325283 3426655

WORK ORDERS

3307481 3307482 3316972 3324496 3326886 3424507

PERMITS

162966 162855 162965 164677 162803 167640 163087
170151 163805 167456 161201 168830 167003 160808
165129 167711 167593 166014 167758 165581

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>REVISION / DATE</u>
Units 1, 2, and 3 Mitigating Systems Performance Indicator Consolidated Entry Derivation Reports	March 2010
Units 1, 2, and 3 Operating Logs	April 1, 2009 through March 31, 2010

Units 1, 2, and 3 Mitigating Systems Performance Indicator Failure Records	April 1, 2009 through March 31, 2010
Units 1, 2, and 3 Margin Reports for Mitigating Systems Performance Indicator	April 1, 2009 through March 31, 2010
Consolidated Data Entry Failure Summary Report # 1183	
PVNGS – Maintenance Rule Mode Summary Report	April 1, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – HPSI A	March 24, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – DG B	March 24, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – HPSI B	March 24, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – DG A	March 24, 2009 through March 31, 2010
NEI 99-02, Regulatory Assessment Performance Indicator Guideline	6

Section 4OA2: Identification and Resolution of Problems

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
81DP-0DC17	Temporary Modification Control	26
31MT-9ZC05	Open/Close Containment Equipment Access Hatch and Missile Shield Doors	22
70DP-9SP01	Spray Pond Piping Integrity Verification	3

81DP-0ZZ01	Civil System, Structure, and Component Monitoring Program	16
40EP-9EO01	Standard Post Trip Actions	17
40DP-9AP06	Standard Post Trip Actions Technical Guidelines	17
40OP-9ZZ11	Mode Change Checklist	80
AC-0203	Conduct of Maintenance	1
01DP-0AP12	Palo Verde Action Request Processing	13
01PR-0AP04	Corrective Action Program	4
81DP-0DC13	Deficiency Work Order	26
01DP-0AP16	PVNGS Self-Assessment and Benchmarking	6
60DP-0QQ02	Trend Analysis and Coding	22

PALO VERDE ACTION REQUESTS

3455216	3447451	3448458	3456981	2989553	3448335	3446313
3178905	3444192	2963265	3115231	3138772	3249954	3470163
3452722						

CONDITION REPORTS / DISPOSITION REQUESTS

3390784	3457836	2910912	114987	3391325	2953739	344792
323530	3471044	3482224				

CONDITION REPORTS ACTION ITEMS

3405839	3403416	2910973	2945536	2916933	2910912
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WORK ORDERS

3321030 2893375 2611623 2331295

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Units 1, 2, and 3 Night Order for Containment Coordinator Turnover Communications Expectations	April 10, 2010
	Essential Spray Pond Water Level Trends	December 7, 2009, January 4, 2010, February 1, 2010, March 1, 2010
ACI 349.3R-02	Evaluation of Existing Nuclear Safety-Related Concrete Structures	
	Installation Specification for Forming, Placing, Finishing, and Curing of Grout and Concrete	8
	Updated Final Safety Analysis Report Section 9.2.5, Ultimate Heat Sink	June 2009
	Engineering Evaluation of Calvert bus fault event	
	Unit 1 Control Room Logs	March 7-8, 2010
	Palo Verde Nuclear Generating Stations Monthly Trend Report	April 2010
	Maintenance Human Performance Index	April 2010
	Operations Human Performance Index	April 2010

2010-2013 Operations Department Human Performance
Plan

2010-2013 Maintenance Department Human
Performance Plan

Section 40A3: Event Follow-Up

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EPIP-01	Satellite Technical Support Center Actions	34
79IS-9SM01	Analysis of Seismic Event	21
40AO-9ZZ21	Acts of Nature	26
EPIP-01	Satellite Technical Support Center Actions	34
40OP-9MB01	Main Generation and Excitation	47
40DP-0OP02	Relay Settings	11
40AL-9MA01	Transformer Trouble Alarm Response	28
41AL-1RK1A	Main XFMR X01A/B/C TRBL	53
EPIP 99	EPIP Standard Appendices	30
40AO-9ZZ08	Load Rejection	23
40OP-9ZZ05	Power Operations	133
14OP-9FP04	Automatic Fire Protection Valves (FP)	8

70DP-0PI01	Performance Indicator Data Mitigating Systems Cornerstone	5
93DP-0LC09	Data Collection and Submittal Using INPO's Consolidated Entry System	10

PALO VERDE ACTION REQUESTS

3486748	3486905	3486798	3487011	3487064	3486756	3486883
3486893	3487004	3430116				

CONDITION REPORTS / DISPOSITION REQUESTS

3317532	3308679	3325283	3426655	3431177		
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CONDITION REPORTS ACTION ITEMS

3431180	3431181	3431445	3436830	3440123	3440125	3440126
3440127	3440129	3440130	3440269	3440273	3440772	3440818
3440824						

WORK ORDERS

3307481	3307482	3316972	3324496	3326886	3424507	3449435
3430163						

PERMITS

162966	162855	162965	164677	162803	167640	163087
170151	163805	167456	161201	168830	167003	160808
165129	167711	167593	166014	167758	165581	

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-FPP-002	P & I Diagram Fire Protection System	16

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>REVISION / DATE</u>
NRC Form 361 Reactor Plant Event Notification, EN# 45823	April 8, 2010
Form EP-0511 Core Exit Thermocouple CDA	April 8, 2010
Form EP -0541 Palo Verde NAN Emergency Message Form	April 8, 2010
Form EP-0012 Emergency Action Log	April 8, 2010
Form EP-0542 Follow-Up Emergency Message Form	April 8, 2010
UFSAR Section 5.2, Integrity of Reactor Coolant Pressure Boundary	15
ERO EP Critique of March 22, 2010 Unusual Event	April 7, 2010
NRC Form 361, Reactor Plant Event Notification Worksheet	June 18, 2010
Form EP-0012, PVNGS Emergency Planning Emergency Action Log	June 18, 2010
Form EP-0541, PVNGS Emergency Preparedness, Palo Verde NAN Emergency Message Form	June 18, 2010
Palo Verde Procedure to Take #1 Generator Off Line	March 4, 2004
Print Block on Plant Computer Alarm Printer, Unit 1 Alarm Typer	June 18, 2010
Unit 1 Control Room Log	June 18, 2010

Units 1, 2, and 3 Mitigating Systems Performance Indicator Consolidated Entry Derivation Reports	March 2010
Units 1, 2, and 3 Operating Logs	April 1, 2009 through March 31, 2010
Units 1, 2, and 3 Mitigating Systems Performance Indicator Failure Records	April 1, 2009 through March 31, 2010
Units 1, 2, and 3 Margin Reports for Mitigating Systems Performance Indicator	April 1, 2009 through March 31, 2010
Consolidated Data Entry Failure Summary Report # 1183	
PVNGS – Maintenance Rule Mode Summary Report	April 1, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – HPSI A	March 24, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – DG B	March 24, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – HPSI B	March 24, 2009 through March 31, 2010
Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – DG A,	March 24, 2009 through March 31, 2010
NEI 99-02, Regulatory Assessment Performance Indicator Guideline	6
Licensee Event Report (LER) 05000529/2010-001-00, Essential Chiller B Inoperable Due to Incorrectly Positioned Head Pressure Control Bypass Valve	March 29, 2010

CRDR 343117 (Revision 1) 2MECBE01 Inoperable due to
2PEWBV349 Not Being Locked in Closed Position Significant Root
Cause Investigation Report

March 26, 2010

Control room logs

December 24, 2009
and January 26, 2010

NUREG 1022, Event Reporting Guidelines 10 CFR 50.72 and 50.73

2

Section 40A5: Other Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75ST-9ZZ02	Sealed Source Leak Test Surveillance	6
5076 – P-001	Procedure for Palo Verde New RVCH Package Assembly	2
BIGGE 02271-P1	Procedure to Upend New RVH, Remove the Shipping Container, and Stage in the HAF	5
BIGGE 02271-P7	Component Load Test Qualification Procedure	1
MRS-SSP-2386	Assembly/Disassemble Assembly Crane at RRVCHSF, Up-end RRVCH/Remove Shipping Container & Stage in RRVCSF & Transport/Stage RRVCH at Equipment Hatch	1
MRS-SSP-2544	Removal of Missile Shield Electrical Components	2
MRS-SSP-2371	Packaging/Radiation Protection Preparations for Removal & Disposal of Old Reactor Vessel Closure Head from Containment	1
MRS-SSP-2382	CSS Modification and Installation of CSS & CEDM Lighting	1
MRS-SSP-2374	Removal/Modify/Install/Reinstall 4" Nuclear Cooling Piping, Supports & Instrumentation	0

MRS-SSP-2377	Remove SSC Interferences, Attach to OMS, Modify an Dispose ACU Ductwork & Exhaust Ducts, Dispose Old Lift Rig, Modification of Dampers and Installation of East Ductwork	1
MRS-SSP-2387	Assemble/Disassemble ECHD and Assemble/Disassemble Erection Crane Inside Protected Area	0
MRS-SSP-2388	Rig Out ORVCH from RCB (BIGGE), Transport and Rigging RRVCH into RCB (BIGGE) and Transport ORVCH to LTSF (BIGGE)	1
MRS-SSP-2369	RRVCH Preps/Installation of Lower SHA Arrangement/Install Dome Insulation (TRANSCO)	1
MRS-SSP-2372	Installation Flange Insulation (TRANSCO)	0
31MT-9RC30	Reactor Vessel Head Removal and Installation	42
2OSP-OSK08	Compensatory Measures for Loss of Security Equipment / Effectiveness	46
31MT-9RC01	Reactor Vessel Ventilation, Cable Support Structure and Insulation Removal and Installation	35
BIGGE-02271-P2	Procedure To Install Lower Shroud	4
AC - 0252	Mobile Crane Operations	0
AC - 0252	Field Use of Rigging	0
AC - 0249	PVNGS Rigging Control	0
30DP-9MP03	System Cleanliness and Foreign Material Exclusion Controls	15
31MT-9ZC07	Miscellaneous Containment Building Heavy Loads	29
DS-ECT-02	Procedure for ECT Acquisition of RVH	5

DS-ECT-03	ECT Analysis Procedure of RVH Penetration and J-Grove Weld	4
DS-UT-01	Ultrasonic Acquisition Procedure for RVH Penetrations	5
DS-UT-02	UT Analysis Procedure of RVH Penetrations	5
PP-NDE-013	NDE Program Plan	3
EPPU0311	Ultrasonic and Eddy Current Acquisition Procedure of RVH Vent Nozzle	0
EPPU0301	Procedure for Ultrasonic Examination of Cladding Area	0
EPPU0302	Procedure for Liquid Penetrant Examination	0
500297092	Quality Verification Documentation for Replacement Reactor Vessel Closure Head and Control Element Drive Mechanism, Volume 7	0
N-7784-30	Ultrasonic Examination Procedure for Head Forging	0
QN-200	Quality Assurance Manual for ASME III and KEPIC-MN & SN Construction and Material Organization Applications	13
DS-ME-06-3	Design Specifications	5

PALO VERDE ACTION REQUESTS

3450872	3446319	3347797	3350297	3438031	3430184	3431712
3425823	3429629	3413019	3404303	3403094	3370744	3371174
3359815	3359813	3353331	3403099	3415847	3311430	3425903
3425890	3402957	3425628	3402956	3402955		

CONDITION REPORTS / DISPOSITION REQUESTS

32800774 3373537 3333298

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
BIGGE 06E24-1	Upend NRVCH in WMG Package Sheets 1 through 8	3
BIGGE 06E24-2	Removal of WMG Packaging, Remove Upper Section "C" Sheets 1 through 9	3
BIGGE 06E24-3	Install Lower Shroud Assembly General Arrangement, Sheets 1 through 5	3
BIGGE 06E24-5.1	Move Old RVCH from Head Stand to Downend Position at Equipment Hatch, Sheets 1 through 15	2
BIGGE 06E24-40	New RVCH Upend /Downend Equipment General Arrangement, Sheets 1 through 9	3
BIGGE 06E24-50	New & Old RVCH Containment Lift rigging General Arrangement, Sheets 1 & 2	0
BIGGE 06E24-60	WMG Package Upend Rigging, Sheets 1 & 2	0
BIGGE Job 2271 DWG 62	WMG Package Removal Rigging Lift New RVCH to Remove Bottom Plate, Sheets 1 & 2	0
BIGGE 06E24-61	WMG Package Removal Rigging Sheets 1 & 2	0
BIGGE 06E24-70	Old RVCH Transport, Sheets 1 & 2	1
BIGGE 06E24-90	New RVCH Temporary Storage Cribbing End View and Section View, Sheets 1 & 2	2

Westinghouse SK – 10002475	Component Handling Replacement Reactor Vessel Closure Head Cover Rigging and Installation	0
Doosan D-PV- 11101-C01	RV Closure Head General Arrangement	7
Doosan D-PV- 11101-C02	Closure Head Assembly	1
Doosan D-PV- 11900-C01	Package Assembly, Sheets 1 through 4	0
Doosan D-PV- 11900-C02	Top Lift Lug Assembly	0
Doosan D-PV- 11900-C03	Downending Pin Assembly	0
Doosan D-PV- 11900-C04	Lift Bushing Assembly	0
Doosan D-PV- 11910-C01	Bottom Plate Assembly, Sheets 1 through 4	0
Westinghouse PVSHA-050	RRVCH Shipping Package CEDM Support Rigging Plan	1
Westinghouse PVSHA-051	RRVCH Shipping Package Bottom Plate Rigging Plan	1
Westinghouse 10019E32	21,500 lb Circular Lifting Rig Assembly	2

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
CN-RIDA-08-25	Palo Verde Units 1, 2, and 3 RVI Evaluation for a Flat, Concentric, Head Drop from 40 Feet	1
CN-MRCDA-08-49	Palo Verde Units 1, 2, and 3 Reactor Vessel, Supports, and Main Loop Piping Evaluation for a Concentric Head Drop from 40 Feet	1

WORK ORDERS

3452556	2292340	3453468	2992340	3260624	3234434	3234436
3234437	3260627	3234439	3308203	3388751	3403370	3402983
3234528	3234476	3234478	3234479	3234480	3234481	3234482
3234483	3234484	3234485	3234486	3234487	3260611	3260632
3378138	3378145	3234488	3260607	3260612	3260613	3260614
3260615	3260616	3379450	3444447	3426292	3388753	3425798
3403374	3402976	3426434	3426280	3311954	3234521	3234523
3234524	3234514	3234518	3234519	3234529	3416444	3403470
3354091	3360941	3360948	3388772	3402676	3403675	3404852
3414032	3430341	3425983	3434652	3431902	3430808	3438076
3430356	3351136	3348532	3190342			

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
NRC Form 748	National Source Tracking Transaction Report	January 29, 2009

NRC Form 748	National Source Tracking Transaction Report	February 12, 2010
	Annual Inventory and Checklist 2010	February 18, 2010
	National Source Tracking Transaction Reconciliation	January 11, 2010
	Radioactive Source Inventory Card	September 24, 2008
	Radioactive Source Inventory Card	March 25, 2009
20100329-0010	Doosan Dimensional Inspection Record for Palo Verde #2 Reactor Vessel Closure Head	March 29, 2010
NCR 100214	Doosan Non-Conformance Report 100214 Evaluation and Disposition	April 1, 2010
	1MRCEX01 Vessel Preliminary Disposition 1 for DFWO 3452556	April 5, 2010
	Palo Verde Nuclear Generating Station Security Plan, Training and Qualification Plan, Safeguard Contingencies Plan, and Independent Spent Fuel Storage Installation Security Plan	12
N001-0303-00172	Palo Verde Units 1, 2, and 3 RVI Evaluation for a Flat, Concentric, Head Drop from 40 Feet	0
N001-0303-00171	Palo Verde Units 1, 2, and 3, Reactor Vessel, Supports, and Main Loop Piping Evaluation for a Concentric Load Drop from 40 Feet	0
	Liebler Crawler Crane LR 1300 Operating Manual	
	Reactor Vessel Closure Head Haul Route, Design Input Requirements Checklist	0