



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

February 9, 2010

EA-09-330

Randall K. Edington,
Executive Vice President, Nuclear
and Chief Nuclear Officer
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 05000528/2009005, 05000529/2009005, AND
05000530/2009005, AND NOTICE OF VIOLATION

Dear Mr. Edington:

On December 31, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed integrated report documents the inspection findings, which were discussed on January 26, 2010, with Mr. D. Mims, Vice President, Regulatory Affairs, and other members of your staff.

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

One violation is cited in the enclosed Notice of Violation and the circumstances surrounding it are described in detail in the subject inspection report. The violation involved failure to establish and implement an adequate procedure to control essential spray pond missile hazards and ensure operability of the ultimate heat sink. Although determined to be of very low safety significance (Green), this violation is being cited in the Notice because not all of the criteria specified in Section VI.A.1 of the NRC Enforcement Policy for a noncited violation were satisfied. Specifically, Palo Verde Nuclear Generating Station failed to restore compliance within a reasonable time after the violation was first identified in NRC Inspection Report 05000528, 05000529, 05000530/2008004. You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

This report documents three self-revealing findings of very low safety significance (Green), and one Severity Level IV violation. All of these findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety

significance of these violations and because they were 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 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 DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission Region IV, 612 E. Lamar Blvd., Suite 400, Arlington, Texas 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. In addition, if you disagree with the characterization of 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. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), 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
Projects, Branch D
Division of Reactor Projects

Docket Nos. 50-528
50-529
50-530

License Nos. NPF-41
NPF-51
NPF-74

Enclosures:

1. Notice of Violation.
2. NRC Inspection Report 05000528/2009005, 05000529/2009005, and 05000530/2009005 w/Attachment: Supplemental Information

cc w/enclosures:

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Inspection Reports/MidCycle and EOC Letters to the following:
ROPreports

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File located: R:_REACTORS\PV\2009\PV2009-005RP-RIT.doc ML 100400070

SUNSI Rev Compl.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ADAMS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Reviewer Initials	RL
Publicly Avail	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sensitive	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Sens. Type Initials	RL
RIV:RI:DRP/D	RI:DRP/D	RI:DRP/D	SRI:DRP/D	SPE:DRP/D	C:DRS/OB
JBashore	MCatts	MBaquera	RTreadway	DAllen	MHaire
/RA by Email/	/RA by Email/	/RA by Email/	/RA by Email/	/RA/	/RA/
2/8/10	2/2/10	2/2/10	2/2/10	2/8/10	2/8/10
C:DRS/EB1	C:DRS/EB2	C:DRS/PSB1	C:DRS/PSB2	C:DRS/TSB	C:DRP/PBD
TFarnholtz	NO'Keefe	MShannon	GWerner	MHay	RLantz
/RA/	/RA/	/RA/	/D for/	/DAP for /	/RA/
1/27/10	1/27/10	1/28/10	1/28/10	1/29/10	2/8/10

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NOTICE OF VIOLATION

Arizona Public Service Company
Palo Verde Nuclear Generating Station

Docket Nos.: 50-528,-529,-530
License Nos.: NPF-41, -51, -74
EA-09-330

During an NRC inspection conducted on October 1 through December 31, 2009, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, from July 11, 2008 through December 31, 2009, the licensee failed to prescribe adequate procedures for the essential spray ponds. Specifically, the licensee failed to ensure an adequate procedure was available to control essential spray pond missile hazards and ensure operability of the ultimate heat sink.

This violation is associated with a Green Significance Determination Process finding.

Pursuant to the provisions of 10 CFR Part 2.201, Arizona Public Service Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region IV, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice of Violation (Notice), within 30 days of the date of the letter transmitting this Notice. This reply should be clearly marked as a "Reply to Notice of Violation EA-09-330," and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC website at www.nrc.gov/reading-rm/pdr.html or www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have

withheld and provide in detail the basis for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR Part 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR Part 73.21.

Dated this 8th day of February 2010.

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Dockets: 50-528, 50-529, 50-530

Licenses: NPF-41, NPF-51, NPF-74

Report: 05000528/2009005, 05000529/2009005, 05000530/2009005

Licensee: Arizona Public Service Company

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

Location: 5951 S. Wintersburg Road
Tonopah, Arizona

Dates: October 1 through December 31, 2009

Inspectors: J. Bashore, Resident Inspector
M. Baquera, Resident Inspector
M. Catts, Resident Inspector
R. Treadway, Senior Resident Inspector
B. Henderson, Reactor Inspector
M. Young, Reactor Inspector
L. Carson II, Senior Health Physicist
T. Farina, Reactor Inspector
B. Larson, Senior Operations Engineer

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

SUMMARY OF FINDINGS

IR 05000528/2009005, 05000529/2009005, 05000530/2009005; 10/01/09 – 12/31/09; Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Op. Evals., Refuel and Outage Act., Access Cont. To Rad. Sig. Areas, ALARA Plans & Cont., Event Flwp.

This report covered a 3-month period of inspection by resident and regional inspectors. Four Green findings, of which one is a cited violation and three are noncited violations, and one Severity Level IV finding 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's 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 and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the failure of operations personnel to adequately establish and implement procedures associated with a loss of instrument air to containment. Specifically, on December 3, 2009, the alarm response and abnormal operating procedures available to the Unit 3 control room operating staff were inadequate to consistently diagnose and mitigate a loss of instrument air to containment. This issue was entered into the licensee's corrective action program as Condition Report/Disposition Request (CRDR) 3411457.

The performance deficiency associated with this finding involved the failure of operations personnel to adequately establish and implement alarm response and abnormal operating procedures associated with a loss of instrument air to containment. The finding is more than minor because it is associated with the procedure quality attribute of the Initiating Events Cornerstone and affects the cornerstone objective of limiting 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 the likelihood that mitigation equipment or functions will not be available. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to implement the corrective action program with a low threshold for identifying issues [P.1(a)] (Section 4OA3).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of engineering personnel to establish adequate procedures to ensure evaluation and approval of transient missile hazards that have an effect on the operability of

the essential spray ponds. Specifically, since January 15, 1997, civil engineering personnel failed to develop an adequate procedure to verify missile density criteria are not exceeded to ensure operability of the essential spray ponds during severe weather. Due to the licensee's failure to restore compliance from the previous NCV 05000528/2008004-04 within a reasonable time, this violation is being cited in a Notice of Violation consistent with Section VI.A of the NRC Enforcement Policy. This issue was entered into the licensee's corrective action program as CRDR 3397839.

The finding is more than minor because it is associated with the external factors attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. 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 result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because appropriate corrective actions were not taken to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity [P.1(d)] (Section 1R15).

Cornerstone: Barrier Integrity

- Green. A self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," was identified for the failure of maintenance personnel to maintain containment closure capability as required by Procedure 70DP-ORA01, "Shutdown Risk Assessments." Specifically, on October 8, 2009 maintenance personnel designated for emergency closure of the containment equipment hatch left containment to attend a safety briefing for more than four hours before they returned to perform their required duties. This issue was entered into the licensee's corrective action program as PVAR 3389284.

The performance deficiency associated with this finding involved the failure of maintenance personnel to follow the requirements of Procedure 70DP-ORA01, "Shutdown Risk Assessments", and ensure a containment closure team was in containment and capable of closing the containment equipment hatch within 30 minutes. 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," the finding was determined to be a type B finding because it affected only large early release frequency, not core damage frequency, at shutdown. A phase 2 analysis using Table 6.4, "Phase 2 Risk Significance-Type B Findings at Shutdown," was performed with the following considerations: the plant was in cold shutdown with the reactor coolant system vented, steam generators not available, and within eight days of shutdown, the condition existed for less than eight hours, and there was mitigation equipment

out of service. The senior reactor analyst determined that that the finding has very low safety significance (Green) based on the short time period that the condition existed, the low probability of a loss of cooling event during this period with two fully-functional trains available, and the time it would have taken to close the hatch was well less than the time until the core would have become uncovered. This finding was determined to have a cross cutting aspect in the area of human performance associated with work control because the licensee failed to appropriately coordinate work activities by incorporating actions to address plant conditions that may affect work activities [H.3(b)] (Section 1R20).

Cornerstone: Occupational Radiation Safety

- Green. A self-revealing noncited violation of Technical Specification 5.7.1, "High Radiation Areas," was identified for the failure of radiological protection personnel to perform a prejob briefing to ensure workers are aware of radiological conditions in a high radiation area as required by the radiation exposure permit. Specifically, on October 20, 2009, nine contract workers were preparing to install an anticontamination sock over the Unit 2 old reactor vessel head, signed onto a radiation exposure permit which allowed access to a high radiation area but failed to receive a brief on the local dose rates surrounding the reactor vessel head by the job coverage radiation protection technician. This issue was entered into the corrective action program as CRDR 3394172.

The finding was more than minor because it was associated with the exposure control attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to properly control access to a high radiation area and had the potential to increase personnel dose. Using Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to have very low safety significance because it was not associated with "as low as reasonably achievable", there was no overexposure, there was no substantial potential for an overexposure; and the ability to assess dose was not compromised. This finding has a crosscutting aspect in the area of human performance associated with work practices because the licensee's radiation protection staff failed to communicate expectations to contract personnel [H.4(b)] (Section 2OS1).

Cornerstone: Public Radiation Safety

- Severity Level IV. The inspectors identified a noncited violation of 10 CFR 50.71 "Maintenance of Records," because the licensee failed to update their updated final safety analysis report with submittals that include the effects of a change made to the facility. Specifically, the licensee built the old steam generator storage facility on the owner controlled area for long-term radwaste storage of six decommissioned steam generators and three reactor vessel heads and failed to update the updated final safety analysis report to include these changes to the facility and all safety analyses and evaluations performed. This issue was entered in the licensee's corrective action program as CRDR 3398042.

This issue was dispositioned using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. The finding is more than minor because it has a material impact on licensed activities

in that the six decommissioned steam generators and the Unit 2 reactor vessel head, with a significant radioactive source term have been relocated from the plant radiological controlled area to the owner controlled area. In addition, the radwaste management program was affected because the licensee determined that this low-level radwaste facility will store these large components until the site is decommissioned. The finding is characterized as a Severity Level IV, noncited violation in accordance with NRC Enforcement Policy, Supplement I, and was treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. This finding was reviewed for crosscutting aspects and none were identified because the performance deficiency is not indicative of current performance (Section 2OS2).

B. Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at essentially full power for the duration of the inspection period.

Unit 2 operated at full power until October 3, 2009, when the unit was shutdown for Refueling Outage 2R15. The unit was restarted on December 1, 2009, and returned to full power on December 6, 2009. On December 9, 2009, control room operators lowered reactor power to approximately 60 percent power and subsequently to 10 percent power to take the main turbine offline for repairs on the 'C' main transformer. The unit was restarted on December 12, 2009, and returned to full power on December 15, 2009, and remained at full power for the duration of the inspection period.

Unit 3 operated at full power until December 3, 2009, when the reactor was tripped and the unit shutdown due to a loss of instrument air to containment. Repairs were made to the instrument air system and the unit was restarted on December 5, 2009, and returned to full power on December 11, 2009, and remained at full power for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- November 11, 2009, Unit 1, containment spray system train B
- November 25, 2009, Unit 2, recirculation actuation system train A and B
- December 8, 2009, Unit 2, essential chilled water system 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, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (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 walked down 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 of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

On November 13, 2009, the inspectors performed a complete system alignment inspection of the Unit 2 shutdown cooling system 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 walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, 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 of significance 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:

- October 26, 2009, Unit 3, condensate storage pump house and tunnel
- October 27, 2009, Unit 3, spray pond pump house

- November 11, 2009, Unit 2, auxiliary building 40 foot and 77 foot elevations
- November 11, 2009, Unit 2, auxiliary building 88 foot and 140 foot elevations

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 fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and 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 of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the UFSAR, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also walked down the areas listed below 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.

- November 10, 2009, Unit 2, underground cable vaults for auxiliary feedwater pumps
- November 20, 2009, Units 1, 2, and 3, underground cable vaults for station blackout generator

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

b. Findings

No findings of significance were identified.

1R08 Inservice 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 observed and reviewed three types of nondestructive examination activities and two welds 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	Main steam to auxiliary feedwater pump p01 (53-25)	Ultrasonic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump p01 (53-21)	Magnetic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump p01 (53-22)	Magnetic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump p01 (53-23)	Magnetic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump p01 (53-25)	Magnetic Test
High Pressure Safety Injection	Pump A discharge piping (106-1)	Ultrasonic Test
High Pressure Safety Injection	Pump A discharge piping (106-21)	Ultrasonic Test
High Pressure Safety Injection	Pump A discharge piping (106-1)	Penetrant Test
High Pressure Safety Injection	Pump A discharge piping (106-21)	Penetrant Test

The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Safety Injection	Cold leg safety injection nozzle dissimilar metal butt weld (9-10)	phased array Ultrasonic Test
Safety Injection	Cold leg safety injection nozzle dissimilar metal butt weld (11-10)	phased array Ultrasonic Test
Safety Injection	Cold leg safety injection nozzle dissimilar metal butt weld (13-10)	phased array Ultrasonic Test
Safety Injection	Cold leg safety injection nozzle dissimilar metal butt weld (15-9)	phased array Ultrasonic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump P01 (53-21)	Ultrasonic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump P01 (53-22)	Ultrasonic Test
Auxiliary Feedwater	Main steam to auxiliary feedwater pump P01 (53-23)	Ultrasonic Test
Chemical Volume and Control System	2PCHAV328 - seal weld body to bonnet	Penetrant Test

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 that 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>
Chemical Volume And Control System	2PCHAV328 -seal weld body to bonnet	gas tungsten arc welding
Safety Injection System	24 inch diameter butt welds – sump isolation valve replacement (3187434-30)	gas tungsten arc welding

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 02.01.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The Unit 2 reactor pressure vessel head is being replaced during this outage. The required inspections have been performed and documented in Section 4OA5 of this report.

b. Findings

No findings of significance 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 there were no engineering evaluations for those components where boric acid was identified. 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 02.03.

b. Findings

No findings of significance 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 Electrical

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 licensee plugged ten tubes in steam generator 21 and four tubes in steam generator 22. A loose part, believed to be an eggcrate wedge, has been identified in steam generator 21. It was identified in the previous outage, but has migrated downward. The tubes in the vicinity were plugged and staked. 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 outage (2R15). The inspection scope for 2R15 included:

- 100 percent visual inspection of installed plugs
- Tubesheet secondary side foreign object search and retrieval
- 100 percent bobbin examination in both steam generators from tube end to tube end
- Plus point inspection of U-bends in rows 1 through 4
- 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 02.04.

b. Findings

No findings of significance were identified.

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

a. Inspection scope

The inspectors reviewed eight 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 02.05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Annual Inspection

a. Inspection Scope

The inspector reviewed the annual operating test results for 2009. Since this was the first half of the biennial requalification cycle, the licensee was not required to administer a written examination. These results were assessed to determine if they were consistent with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," guidance and Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process," thresholds. This review included the test results for a total of 20 crews (15 shift crews and 5 staff crews) composed of 70 senior reactor operators and 34 reactor operators. All individuals and crews passed all portions of the operating test.

The inspector completed one sample.

b. Findings

No findings of significance were identified.

.2 Quarterly Inspection

a. Inspection Scope

On December 9, 2009, 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 actions in the conservative direction
- 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 supervisors
- 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 inspection sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- November 2, 2009, Unit 3, main generator regulator inverter failure
- December 11, 2009, Unit 2, main transformer elevated temperatures

The inspectors reviewed events such as where ineffective equipment maintenance has 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

No findings of significance were identified.

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

a. Inspection Scope

Risk Assessment and Management of Risk

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 from service for work:

- September 14, 2009 and October 19, 2009, Unit 1, emergent work risk assessment associated with switchyard breaker 982
- October 22, 2009, Unit 3, excore control channel 1 out of service for emergent work
- November 9 through 17, 2009, Unit 2, high pressure safety injection pump train B removed from service for corrective maintenance concurrent with emergency diesel generator train A unavailability during refuelling outage
- December 8, 2009, Unit 2, emergency diesel generator train A out of service for planned maintenance
- December 11, 2009, Unit 2, main transformer C out of service for emergent repairs of the neutral bushing

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 five maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- April 10, 2009, Units 1, 2, and 3, operability determination for lack of design basis accident testing for containment coating
- September 28, 2009, Units 1, 2, and 3, operability determination for start-up transformer AE-NAN-X01 sudden fault pressure relay annunciator single channel failure
- October 26, 2009, Unit 2, operability determination for air leak on emergency diesel generator B cylinder 9R
- October 31, 2009, Unit 2, operability determination for the failure of 2PCHAV190 check valve
- November 4, 2009, Unit 3, essential spray pond A bacterial analysis
- November 11, 2009, Unit 2, essential cooling water heat exchanger A circumferential cracks
- November 19, 2009, Units 1, 2 and 3, operability determination for radioactive water storage tank degraded condition

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'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 seven operability evaluation inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

Introduction. The inspectors identified a Green cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of engineering personnel to establish adequate procedures to ensure evaluation and approval of transient missile hazards that have an effect on the operability of the essential spray ponds. Specifically, since January 15, 1997, civil engineering personnel failed to develop an adequate procedure to verify missile density criteria are not exceeded to ensure operability of the essential spray ponds during severe weather. This issue was entered into the licensee's corrective action program as Condition Report/Disposition Request (CRDR) 3397839.

Description. On October 27, 2009, the inspectors were performing walkdowns of the Unit 2 essential spray ponds and observed a high concentration of potential tornado borne missile hazards within 400 feet of the essential spray ponds. The potential missile hazards included stacks of pallets, temporary light fixtures, stanchions, scaffolding, temporary structures, and other miscellaneous materials. The inspectors then notified the Unit 2 shift manager of the potentially nonconforming condition.

The following morning on October 28, 2009, the inspectors observed an even higher concentration of potential missile hazards including approximately 40 pallets stacked in the immediate vicinity of the Unit 2 essential spray ponds. The inspectors notified civil engineering personnel who then conducted a walkdown of the essential spray ponds for Unit 2. PVAR 3397505 documented the walkdown and noted numerous areas of noncompliance with Specification 13-CN-0389, "Installations Specification for the Control of Potential Tornado Borne Missiles in Outside Areas," Revision 0. Later that day operations personnel reviewed PVAR 3397505 and requested civil engineering to perform an evaluation of the areas surrounding the Unit 1 and Unit 2 essential spray ponds to support an operability determination/functional assessment.

On the morning of October 29, 2009, the inspectors observed that the stack of pallets and other miscellaneous potential missile hazards still had not been relocated or secured in accordance with Specification 13-CN-0389. The inspectors noted that civil engineering personnel conducted their review to ensure compliance and utilized Procedure 81DP-0ZY01, "Control of Potential Tornado Borne Missiles in the Outside Areas," Revision 3. The engineering evaluation was documented in Component Observation Report 09-9-011. The evaluation concluded that while "an excessive number of temporary structures" caused certain zones to exceed the maximum

allowable average missile density of 4 per 10,000 square feet, the overall density across all zones surrounding the Unit 1 and Unit 2 essential spray ponds was less than the maximum allowable density. Based on this evaluation, operations personnel performed an functional determination and declared the essential spray ponds for Units 1 and 2 functional.

The inspectors analyzed the civil engineering evaluation and concluded it accurately represented the potential missile hazard density at the time of the evaluation. However, in response to PVAR 3397505, maintenance personnel removed potential missile hazards from within 400 feet of the spray ponds the morning of October 29, 2009. The evaluation civil engineering personnel conducted on the afternoon of October 29, 2009 did not include at least 30 additional pallets that were within 400 feet of the Unit 2 essential spray ponds that the inspectors had photographed the day before. When the inspectors shared these photographs with civil engineering personnel, the additional pallets were included in a second evaluation, which concluded the maximum allowable density of 4 missiles per 10,000 square feet across all zones surrounding the Unit 2 essential spray ponds was exceeded. At the time, Unit 2 was defueled as part of Refueling Outage U2R15 and the Unit 2 essential spray ponds were not required to be operable per technical specifications. However, they were being credited for spent fuel pool cooling and therefore required to be "Functional" as defined by Section 5.1 of Procedure 40DP-9OP26 "Operations PVAR Processing and Operability Determination/Functional Assessment," Revision 26.

During their review, the inspectors also noted that UFSAR, Section 3.5.1.4, "Missiles Generated by Natural Phenomena (Tornados)," stated, in part, that tornado missile protection is not provided for the essential spray pond nozzles because the probability of loss of the ultimate heat sink safety function has been demonstrated by probabilistic risk assessment to be less than a median value of 10^{-7} per reactor year or a mean value of 10^{-6} per reactor year without missile protection. The licensee ensured the probabilistic risk assessment numbers provided in UFSAR Section 3.5.1.4 were satisfied by giving recommended missile densities in Calculation 13-NC-SP-201, "Spray Pond Tornado Missile Damage Frequency," Revision 3. To ensure the missile densities given in calculation 13-NC-SP-201 were not exceeded, civil engineering personnel perform quarterly walkdowns of the essential spray ponds, and rely on ensuring the requirements of Procedure 81DP-0ZY01 and Specification 13-CN-0389 are implemented to control transient missile hazards.

During their review, the inspectors noted a previous noncited violation (NCV 05000528/2008004-04, Failure to Provide an Adequate Procedure to Control Essential Spray Pond Missile Hazards) in NRC integrated inspection report 2008004 for a similar performance deficiency identified July 11, 2008. The inspectors reviewed corrective actions associated with that violation detailed in adverse CRDR 3224028 to determine why the licensee failed to restore compliance within a reasonable time. The inspectors noted that the corrective actions to restore compliance included revising Procedure 30DP-09MP01 "Conduct of Maintenance" to add a step instructing maintenance personnel to secure potential missile hazards in accordance with Procedure 81DP-0ZY01. The corrective actions also included reviews of Procedure 81DP-0ZY01 and Procedure 12DP-0MC45 "Management of Contracts and Supplier Personnel," in which engineering personnel concluded that these procedures adequately addressed the control of potential missile hazards around the essential spray ponds.

Prior to NCV 05000528/2008004-04, the inspectors noted a noncited violation (NCV 05000528; 529; 530/2007012-01, Failure to Implement the Operability Determination process) in NRC supplemental 95003 inspection report 2007012 discussed a similar performance deficiency regarding potential missile hazards around the essential spray ponds. In this case the performance deficiency was the failure of operations personnel to perform an operability determination for an unanalyzed condition involving a high concentration of potential missile hazards around the essential spray ponds. The corrective actions identified by the licensee for this noncited violation were to enhance Procedure 81DP-0ZY01 to include guidance for engineering personnel. Specifically, civil engineering personnel were to ensure the essential spray ponds were evaluated for missile hazard density when maintenance activities involving potential missile hazards occurred.

On January 30, 2009, as part of the licensee's internal corrective actions for non-cited violations associated with the 95003 inspection, the licensee reviewed the treatment of potential missile hazards and concluded that Procedure 81DP-0ZY01 was inadequate for controlling missile hazards around the essential spray ponds. The licensee initiated CRDR 3280781 and conducted an apparent cause evaluation to investigate and correct the ineffective control of tornado-borne missile hazards. The inspectors noted that corrective actions called for in the apparent cause evaluation included assigning ownership to the areas surrounding the spray ponds, revising Procedure 81DP-0ZY01, developing a site wide training plan for missile hazard control, and creating Specification 13-CN-0389 to provide additional guidance for all personnel on control of potential missile hazards. As an interim corrective action, civil engineering personnel conducted monthly walkdowns of the areas surrounding the essential spray ponds from April through September 2009. The inspectors observed that Specification 13-CN-0389 was completed on September 30, 2009; however, the revisions to Procedure 81DP-0ZY01 and the site wide training plan are not scheduled to be completed until January 15, 2010.

After conducting several interviews with civil engineering personnel and reviewing all of the corrective actions to address the missile hazards since the 95003 inspection, the inspectors concluded that the licensee did not restore compliance and provide an adequate procedure to control essential spray pond missile hazards within a reasonable time. The inspectors noted that even if all transient missile hazards were secured in accordance with step 8.7.4 of Specification 13-CN-0389, there was still the potential for missile hazards to accumulate to densities greater than the acceptable limits allowed per calculation 13-NC-SP-201 in the time periods between quarterly walkdowns. The inspectors also noted that the licensee failed to implement adequate interim corrective actions after determining that Procedure 81DP-0ZY01 was inadequate. Following the completion of Specification 13-CN-0389, the inspectors noted procedures governing housekeeping and conduct of maintenance still referenced Procedure 81DP-0ZY01 to address the control of potential missile hazards. The inspectors also noted that Procedure AC-0241, "Maintenance Work Order Process and Control," Revision 0, did not address potential missile hazards when developing maintenance work packages nor did Procedure 12DP-0MC45 "Management of Contracts and Supplier Personnel" directly address informing contractor personnel of procedures for controlling potential missile hazards. Based on the inspector's observations from October 27 through October 29, 2009, it was evident that neither maintenance nor contractor personnel had been adequately trained on the control of potential missile hazards per Specification 13-CN-0389. Furthermore, the inspectors noted that neither Specification 13-CN-0389

nor Procedure 81DP-0ZY01 provided adequate guidance on exactly when an observed concentration of potential missile hazards merits an operability determination or functional assessment for the essential spray ponds.

Analysis. The performance deficiency associated with this finding was the failure of engineering personnel to establish adequate maintenance procedures to ensure evaluation and approval of transient missile hazards that have an effect on the operability of the essential spray ponds. The finding is more than minor because it is associated with the external factors attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because appropriate corrective actions were not taken to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity [P.1(d)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires that activities affecting quality shall be prescribed by instructions, procedures, or drawings, and shall be accomplished in accordance with those instructions, procedures, and drawings. UFSAR, Section 3.5.1.4, "Missiles Generated by Natural Phenomena (Tornados)," provided probabilistic risk assessment criteria to ensure essential spray pond operability. Calculation 13-NC-SP-201 provided missile density requirements to ensure the probabilistic risk assessment numbers in UFSAR, Section 3.5.1.4 are met. Procedure 81DP-0ZY01 and Specification 13-CN-0389 implemented the control of transient missile hazards to ensure the missile density requirements of calculation 13-NC-SP-201 are met. Contrary to the above, between January 15, 1997, and October 27, 2009, the licensee failed to provide adequate procedures to ensure evaluation and approval of transient missile hazards that have an effect on the operability of the essential spray ponds. Specifically, civil engineering personnel failed to develop an adequate procedure to verify missile density criteria are not exceeded. This finding was of very low safety significance and was entered into the licensee's corrective action program as PVAR 3397839. Due to the licensee's failure to restore compliance from the previous noncited violation NCV 05000528/2008004-04 within a reasonable time, this violation is being cited in a Notice of Violation consistent with Section VI.A of the NRC Enforcement Policy: VIO 05000528; 05000529; 05000530/2009005-01 "Failure to Establish Adequate Procedures to Control Potential Tornado Borne Missile Hazards Near the Essential Spray Ponds."

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following temporary/permanent modifications to verify that the safety functions of important safety systems were not degraded:

- October 13, 2009, Unit 1, installation of jumpers for defective heated junction thermocouples on the reactor vessel level monitoring system, train A and train B

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 was 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 effects on mitigating strategies during implementation of emergency operating procedures.

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

b. Findings

No findings of significance 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:

- September 23, 2009, Unit 2, nitrogen to containment low pressure header isolation valve corrective maintenance on indications
- October 28, 2009, Unit 2, emergency diesel generator B load sequencing relay following corrective maintenance
- November 3, 2009, Unit 2, refuelling water tank to train B safety injection following preventative maintenance
- November 11, 2009, Unit 2, atmospheric dump valve accumulators following modification to the system
- November 16, 2009, Unit 3, Generrex regulator inverter 1 following corrective maintenance to replace inverter
- November 27, 2009, Unit 2, safety injection tank 2A discharge check valve to Loop 2A following corrective maintenance
- December 2, 2009, Unit 1, emergency diesel generator B underfrequency relay corrective maintenance due to aged related degradation
- December 15, 2009, Units 1, 2, and 3, station blackout generator battery following planned maintenance

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 (as applicable):

- 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 that 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 eight postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

Unit 2 Refueling Outage 2R15

The inspectors reviewed the outage safety plan and contingency plans for the Unit 2 refueling outage, conducted between October 3, 2009 and December 9, 2009, to confirm that 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
- 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

Unit 3 Maintenance Outage 3M15A

The inspectors reviewed the outage risk management plan and contingency plans for the Unit 3 maintenance outage, conducted between December 3, 2009 and December 5, 2009, to confirm that 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.

- Configuration management, including maintenance of defense in depth, is commensurate with the outage risk management plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service.
- 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.
- Startup and ascension to full power operation and tracking of startup prerequisites

- Licensee identification and resolution of problems related to maintenance outage activities.

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

b. Findings

Introduction. A Green self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," was identified for the failure of maintenance personnel to maintain containment closure capability as required by Procedure 70DP-0RA01, "Shutdown Risk Assessments." Specifically, on October 8, 2009 maintenance personnel designated for emergency closure of the containment equipment hatch left containment to attend a safety briefing for more than 4-hours before they returned to perform their required duties.

Description. Palo Verde, Unit 2, shutdown and commenced a refueling outage on October 1, 2009. On October 7, 2009, the containment equipment hatch was opened to allow for moving of large equipment and components in and out of containment. Procedure 70DP-0RA01, "Shutdown Risk Assessments," required that a trained containment closure team be stationed at the equipment hatch to ensure the capability to isolate containment within the RCS time to boil is maintained. The procedure credited maintenance personnel's ability to close the equipment hatch within 25 minutes.

On October 8, 2009, at approximately 8 p.m., maintenance crews working in containment dropped a reactor vessel guide pin. Due to this event, at approximately 10:30 p.m., all maintenance personnel in containment were directed to stop work pending a safety briefing to discuss the dropped guide pin. At 12:30 a.m. on October 9, 2009, the team responsible for containment closure left containment to await the safety briefing in a trailer near Unit 1. After the safety briefing, at 4:30 a.m., the containment closure team returned to containment. Later that morning, at approximately 6 a.m., the inspectors discussed the event with operations personnel and determined that while the containment equipment hatch closure team was removed from containment, the ability to close the equipment hatch and isolate containment if needed during a loss of shutdown cooling event was in question. During their review, the inspectors reviewed logs and personal statements as well as reviewed timed simulations and determined that the licensee would not have been able to return to containment and close the equipment hatch within 30 minutes contrary to the requirements of Procedure 70DP-0RA01, "Shutdown Risk Assessments."

Analysis. The performance deficiency associated with this finding involved the failure of maintenance personnel to follow the requirements of Procedure 70DP-0RA01, "Shutdown Risk Assessments," to ensure a containment closure team was in containment and capable of closing the containment equipment hatch within 30 minutes. 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 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to represent an actual open pathway in the physical integrity of reactor containment, and required evaluation using Manual Chapter 0609, Appendix H, "Containment Integrity

Significance Determination Process.” The finding was determined to be a Type B finding because it affected only large early release frequency, not core damage frequency, at shutdown. Using Manual Chapter 0609, Appendix H, Table 6.3, “Phase 1 Screening–Type B Findings at Shutdown,” the inspectors determined that a Phase 2 evaluation was required. The inspectors performed a Phase 2 analysis using Table 6.4, “Phase 2 Risk Significance-Type B Findings at Shutdown,” and made the following determinations:

- The plant was determined to be in POS 2E which represents cold shutdown with the RCS vented, steam generators not available, and within 8 days of shutdown
- The finding existed for less than 8-hours
- There was mitigation equipment out of service

The inspectors reviewed Table 6.8, “PWR’s With In-Depth Shutdown Mitigation Capability,” and determined that during the time that Palo Verde lost the capability to close the equipment hatch in less than 30 minutes, there was an in-depth shutdown mitigation capability. The senior reactor analyst reviewed the analysis and determined that the finding has very low safety significance (Green). This was based on the short time period that the condition existed (approximately 4-hours), the low probability of a loss of cooling event during this period (two fully-functional trains were available), and the fact that the time it would have taken to close the hatch in the worst case (30-minutes) was well less than the time until the core would have become uncovered (greater than 60-minutes), indicating that the probability of failing to close the equipment hatch prior to fuel damage was very low. This finding was determined to have a cross cutting aspect in the area of human performance associated with work control because the licensee failed to appropriately coordinate work activities by incorporating actions to address plant conditions that may affect work activities [H.3(b)].

Enforcement. Palo Verde Technical Specification 5.4.1.a, “Procedures,” requires that written procedures be established, implemented, and maintained covering the activities specified in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33, Appendix A, Section 3.f.(1), requires, in part, that during shutdown operations, procedures shall be prepared for maintaining containment integrity. Procedure 70DP-0RA01, “Shutdown Risk Assessments,” Revision 32, required, in part, that a trained containment closure team shall be stationed inside containment and shall be capable of closing the containment equipment hatch within the RCS time to boil (30 minutes). Contrary to the above, on October 8, 2009, maintenance personnel dedicated for the emergency closure of the containment equipment hatch left containment and were unable to perform their containment equipment hatch closure function within the reactor coolant system time to boil. Because the finding is of very low safety significance and has been entered into the license’s corrective action program as PVAR 3389284 this violation is being treated as a noncited violation consistent with section VI.A of the NRC Enforcement Policy: NCV 05000529/2009005-02 “Failure to Maintain Containment Closure Capability.”

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and technical specifications to ensure that the three surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- 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.

- October 23, 2009, Unit 2, essential spray pond pumps train B – comprehensive and inservice pump test
- October 30, 2009, Unit 1, safety injection system train B valve stroke tests
- December 1, 2009, Unit 2, low power physics testing

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

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

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls with respect to the Unit 2 refueling outage and reactor vessel head replacement activities. 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 independent radiation dose rate measurements and reviewed the following items:

- Controls (surveys, posting, and barricades) of five radiation, high radiation, and potential airborne radioactivity areas
- Radiation exposure permit, procedure, and engineering controls and air sampler locations
- Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms
- Adequacy of the licensee's internal dose assessment for any actual internal exposure greater than 50 mrem committed effective dose equivalent
- Barrier integrity and performance of engineering controls in 4 potential airborne radioactivity areas
- Radiation exposure permit briefings and worker instructions
- Adequacy of radiological controls such as required surveys, radiation protection job coverage, and contamination controls during job performance
- Dosimetry placement in high radiation work areas with significant dose rate gradients
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations

- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

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

These activities constitute completion of three of the required 21 samples as defined in Inspection Procedure 71121.01-05. The remaining samples in Inspection Procedure 71121.01 were previously documented in NRC Integrated Inspection Report 05000528; 05000529; 05000530/2009003.

b. Findings

Introduction. A self-revealing Green noncited violation of Technical Specification 5.7.1, "High Radiation Areas," was identified for the failure of radiological protection personnel to perform a prejob briefing to ensure workers are aware of radiological conditions in a high radiation area as required by the radiation exposure permit. Specifically, on October 20, 2009, nine contract workers were preparing to install an anticontamination sock over the Unit 2 old reactor vessel head, signed onto a radiation exposure permit which allowed access to a high radiation area but failed to receive a brief on the local dose rates surrounding the reactor vessel head by the job coverage radiation protection technician.

Description. On October 20, 2009, nine contractor workers were preparing to install an anticontamination sock over the Unit 2 old reactor vessel head. The workers signed onto a radiation exposure permit which allowed access to a high radiation area (the entire area around the vessel head was being controlled as a high radiation area). The contractors entered the radiological controlled area, dressed out, and entered containment after receiving a briefing from the radiation protection technician on containment radiation levels. However, they did not receive a prejob brief on dose rates from radiation protection technician covering the reactor vessel head job as required by the radiation exposure permit. They proceeded to cover the vessel head, but one worker received an 85 mr/hr electronic dosimeter rate alarm. Based on the alarm investigation, it was revealed that none of the nine workers had received the required prejob briefing from a radiation protection technician making them aware of the 100- to 140-mr/hr dose rate levels in the high radiation area. Trip tickets had not been signed by the radiation protection technician covering the job; therefore, they were not authorized to enter the high radiation area. The licensee's immediate corrective action was to counsel the contractor group and radiation protection staff on prejob briefing expectations.

Analysis. The performance deficiency associated with this finding was the failure of the licensee to comply with high radiation area entry requirements and perform radiation exposure permit prejob briefs. The finding was more than minor because it was associated with the exposure control attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective to properly control access to a high radiation area and had the potential to increase personnel dose. Using Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process,"

the finding was determined to have very low safety significance (Green) because it was not associated with “as low as reasonably achievable,” there was no overexposure, there was no substantial potential for an overexposure; and the ability to assess dose was not compromised. This finding has a crosscutting aspect in the area of human performance associated with work practices because the licensee’s radiation protection staff failed to communicate expectations to contract personnel [H.4(b)].

Enforcement. Technical Specification 5.7.1, “High Radiation Areas,” requires that entry into high radiation areas shall be controlled by requiring issuance of a radiation exposure permit. Contrary to the above, on October 20, 2009, nine contractors entered a high radiation area not in accordance with the radiation exposure permit. Specifically, they entered the high radiation area without receiving a pre-briefing and without being made aware of the dose rates in the area. This failure to meet high radiation area entry requirements is of very low safety significance and has been entered into the licensee’s corrective action program as CRDR 3394172. This violation is being treated as a noncited, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000529/2009005-03, “Failure to Comply with High Radiation Area Entry Requirements.”

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining individual and collective radiation exposures As Low As Reasonably Achievable (ALARA). The inspectors used the requirements in 10 CFR Part 20 and the licensee’s procedures required by technical specifications as criteria for determining compliance. The inspectors interviewed licensee personnel and reviewed:

- Current 3-year rolling average collective exposure
- Site-specific trends in collective exposures, plant historical data, and source-term measurements
- Site-specific ALARA procedures
- Five work activities of highest exposure significance completed during the last outage
- ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements
- Intended versus actual work activity doses and the reasons for any inconsistencies
- Interfaces between operations, radiation protection, maintenance, maintenance planning, scheduling and engineering groups
- Integration of ALARA requirements into work procedure and radiation exposure permit documents

- Person-hour estimates provided by maintenance planning and other groups to the radiation protection group with the actual work activity time requirements
- Shielding requests and dose/benefit analyses
- Dose rate reduction activities in work planning
- Post-job (work activity) reviews
- Assumptions and basis for the current annual collective exposure estimate, the methodology for estimating work activity exposures, the intended dose outcome, and the accuracy of dose rate and man-hour estimates
- Method for adjusting exposure estimates, or replanning work, when unexpected changes in scope or emergent work were encountered
- Exposure tracking system
- Use of engineering controls to achieve dose reductions and dose reduction benefits afforded by shielding
- First-line job supervisors' contribution to ensuring work activities are conducted in a dose efficient manner
- 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
- Source-term control strategy or justifications for not pursuing such exposure reduction initiatives
- Specific sources identified by the licensee for exposure reduction actions, priorities established for these actions, and results achieved since the last refueling cycle
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Self-assessments, audits, and special reports related to the ALARA program since the last inspection
- Resolution through the corrective action process of problems identified through postjob reviews and post-outage ALARA report critiques
- Corrective action documents related to the ALARA program and follow-up activities, such as initial problem identification, characterization, and tracking
- Effectiveness of self-assessment activities with respect to identifying and addressing repetitive deficiencies or significant individual deficiencies

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

The inspectors completed 13 of the required 15 samples and 12 of the optional samples as defined in Inspection Procedure 71121.02-05.

b. Findings

Introduction. The inspectors identified a noncited violation of 10 CFR Part 50.71, "Maintenance of Records," because the licensee failed to update their UFSAR with submittals that include the effects of a change made to the facility. Specifically, the licensee built the old steam generator storage facility on the owner controlled area for long-term radwaste storage of six decommissioned steam generators and three reactor vessel heads and failed to update the UFSAR to include these changes to the facility and all safety analyses and evaluations performed.

Description. While inspecting the licensee's Unit 2 reactor head replacement activities related to solid radwaste management and storage, the inspectors identified that the decommissioned steam generator and reactor vessel head storage facility was not described in Chapters 11 and 12 of the UFSAR. Currently, the UFSAR, Chapters 11 and 12, Sections 11.4, "Solid Waste Management", and 12.2.1.7, "Stored Radioactivity," describes facilities for the interim storage of radioactive material such as the dry active waste processing and storage facility and the low level radioactive material storage facility. However, the old steam generator storage facility is not described in the UFSAR. Section 12.2.1.7 of the UFSAR also describes that principal sources of radioactivity not enclosed by plant structures are the independent spent fuel storage installation, the refueling water tank, the holdup tank, the reactor makeup water tank, and the condensate storage tank.

The licensee is committed to Regulatory Guide 1.70, "Standard, Format, and Content of a Safety Analysis Report," Revision 3, which describes the content of Chapter 11, Section 11.4, "Solid Waste Management System." Regulatory Guide 1.70 states, in part, that this section should describe the capabilities of the plant to control, collect, handle, process, package, and temporarily store prior to shipment wet and dry solid radioactive waste generated as a result of normal operation, including anticipated operational occurrences. Regulatory Guide 1.70 also describes Chapter 12 of a safety analysis report stating, in part, that it should provide information on methods for radiation protection, estimated occupational radiation exposures to personnel during normal operation and anticipated operational occurrences including radioactive material handling, processing, use, and storage. Section 12.2.1, "Radiation Contained Sources," is the basis for the radiation protection design that should be described in the manner needed as input to the shield design calculations. Those sources that are contained in equipment like the radioactive waste management systems should be described. The source location in the plant should be specified so that all important sources of radioactivity can be located on plant layout drawings. Also, the safety analysis report should provide a listing of isotope, quantity, form, and use of all sources that exceed 100 millicuries.

The old steam generator storage facility has been in use since 2003 and contains six decommissioned steam generators from Units 1, 2, and 3 and now the Unit 2 reactor vessel head. Each old steam generator contains 48.1 curies of Co-60 and the reactor head contains 7.5 curies Co-60. Thus, the old steam generator storage facility contains 296 curies, a significant source of radioactivity, not described in the licensee's UFSAR.

Analysis. The performance deficiency associated with this finding was failure of the licensee to update the UFSAR to reflect changes made to the facility. This issue was dispositioned using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. The finding is more than minor because it has a material impact on licensed activities in that the six decommissioned steam generators and the Unit 2 reactor vessel head, with a significant radioactive source term, have been relocated from the plant radiological controlled area to the owner controlled area. In addition, the radwaste management program has been affected because the licensee determined that this low-level radwaste facility will store these large components until the site is decommissioned. The finding is characterized as a Severity Level IV, noncited violation in accordance with NRC Enforcement Policy, Supplement I, and was treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. This finding was reviewed for crosscutting aspects and none were identified because the performance deficiency is not indicative of current performance.

Enforcement. Title 10 CFR 50.71, "Maintenance of Records," requires, in part, that licensees periodically update their UFSAR with submittals that include the effects of all changes made in the facility or procedures as described in the UFSAR, and all safety analyses and evaluations performed by the licensee in support of conclusions that changes did not require a license amendment in accordance with 10 CFR 50.59(c)(2). Contrary to this requirement, from 2003 through the present, the licensee made changes to the facility and procedures as described in the UFSAR performed safety analyses and evaluations in support of these changes, but failed to update the UFSAR to include these changes. Specifically, the licensee built the old steam generator storage facility for storing radioactive waste (six replaced steam generators and three reactor vessel heads) on the owner controlled site for long-term storage until decommissioning. Because the finding was of very low safety significance and has been entered into licensee corrective action program as CRDR 3398042, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000528; 05000529; 05000530/2009005-04, "Failure to Periodically Update the UFSAR."

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the third quarter 2009 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 inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index – Auxiliary Feedwater System

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index for Units 1, 2, and 3 – auxiliary feedwater system performance indicator for the period from the fourth quarter 2008 through the third quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, was used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports, mitigating systems performance index derivation reports, and NRC integrated inspection reports for the period of October 1, 2008 through September 30, 2009, 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 heat removal system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - residual heat removal system performance indicator for the period from the fourth quarter 2008 through the third quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, was used. 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 of October 1, 2008 through September 30, 2009, 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 residual heat removal systems sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.4 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - cooling water systems performance indicator for the period from the fourth quarter 2008 through the third quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. 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 of October 1, 2008 through September 30, 2009, 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 are described in the attachment to this report.

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

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences performance indicator for the period from the first quarter 2009 through third quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's issue report database since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. Additionally, the inspectors reviewed the licensee's historical 10 CFR 50.75(g) file and selectively reviewed the licensee's analysis for discharge pathways resulting from a spill, leak, or unexpected liquid discharge focusing on those incidents which occurred over the last few years.

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

b. Findings

No findings of significance were identified.

4OA2 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: the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and 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 of significance 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 of significance were identified.

.3 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.

- November 20, 2009, verification of siren coverage for the emergency planning zone as required by the PVNGS emergency plan

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

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

b. Findings

No findings of significance were identified.

.4 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 July 1 through December 31, 2009, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and 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 single semi-annual trend review inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings of significance were identified.

.5 In-depth Review of Operator Workarounds

a. Inspection Scope

The inspectors conducted a cumulative review of operator workarounds for Units 1, 2, and 3 and assessed the effectiveness of the operator workaround program to verify that the licensee is: (1) identifying operator workaround problems at an appropriate threshold; (2) entering them into the CAP; and (3) identifying and implementing appropriate corrective actions. The review included walkdowns of the control room panels, interviews with licensed operators and reviews of the control room discrepancies log, the lit annunciators' log, the operator workaround list, the operator burdens list, operations concerns list, the operator challenges tracking system, and site performance metrics for operator burdens, lit annunciators, control room discrepancies, and long term tagouts.

These activities constitute completion of one operator workaround program inspection sample as defined in Inspection Procedure 71152-05.

b. Findings and Observations

No findings of significance were identified.

40A3 Event Follow-up (71153)

.1 Event Follow Up

a. Inspection Scope

The inspectors reviewed the two events listed below for plant status and mitigating actions to: (1) provide input in determining the appropriate agency response in accordance with Management Directive 8.3, "NRC Incident Investigation Program;" (2) evaluate licensee actions; and (3) 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.

- December 3, 2009, Unit 3, manual reactor trip from 100 percent power on a loss of instrument air to containment
- December 10, 2009, Unit 2, downpower to support emergent repairs on the main transformer train C neutral bushing

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

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

b. Findings

Introduction. A Green self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the failure of operations personnel to adequately establish and implement procedures associated with a loss of instrument air to containment. Specifically, on December 3, 2009, the alarm response and abnormal operating procedures available to the Unit 3 control room operating staff were inadequate to effectively diagnose and mitigate a loss of instrument air to containment.

Description. On December 3, 2009, Unit 3 was operating at full power. At approximately 3:20 a.m. a ground alarm was received for the 125 Vdc electrical bus E-PKA-M41. The control room crew entered panel B01A alarm response Procedure 43AL-3RK1A and dispatched an area operator to the 125 Vdc electrical bus in question. At approximately 3:29 a.m. the area operator reset the ground alarm. At 3:39 a.m., a high pressure alarm was received for the reactor coolant pump control bleed-off and the crew recognized that control bleed-off isolation to the volume control tank valve CHA-UV-506 position was intermediate and subsequently closed approximately one minute later. The crew determined that the control bleed-off would be redirected to the reactor drain tank via the system relief valve. The crew then entered panel B03A alarm response Procedure 40AL-9RK3A to address the control bleed-off high pressure condition. At approximately 3:48 a.m. a high level alarm was received for the reactor drain tank level being greater than 75 percent, and at 3:54 a.m., a reactor drain tank high pressure alarm was received. During an attempt to pump down the reactor drain tank the crew discovered that valve CHA-UV-560, the reactor drain tank isolation inside containment, was closed and would not reopen. At approximately 4:05 a.m., the crew identified Valve IAA-UV-002, the isolation for instrument air to the containment, was without indication and diagnosed a loss of instrument air to the containment.

The crew entered Procedure 40AO-9ZZ06, "Loss of Instrument Air," and manually tripped the reactor at 4:31 a.m. and secured all four reactor coolant pumps at 4:32 a.m. Control bleed-off was isolated from the reactor coolant pumps at 4:34 a.m. The crew entered Procedure 40EP-9EO07, "Loss of Offsite Power/Loss of Forced Circulation," at 4:41 a.m. due to the loss of forced circulation when all the reactor coolant pumps were secured. The decision to trip the reactor and secure all the reactor coolant pumps and their associated control bleed-off was based on the desire to terminate the addition of reactor coolant to the reactor drain tank. This would prevent rupturing the reactor drain tank blow out disc. It was subsequently determined that the source of the previous ground was a short circuit in the solenoid operator for IAA-UV-002. The short circuit is believed to have cleared when the fuse in the circuit blew, causing a loss of power to valve IAA-UV-002 resulting in the valve closing. A loss of instrument air to the containment resulted when valve IAA-UV-002 closed.

Alarm response Procedure 43AL-3RK1A, "125V 1E CC M41 CHGR A/AC PNL D21 TRBL," addressed the ground indication received at 3:20 a.m. This procedure implemented ground isolation steps but did not reference specific loads on panel

PKA-M41. In addition, since the ground cleared and was subsequently reset when the in-line fuse blew, no attempt to identify the source of the ground was made. Alarm response Procedure 40AL-9RK3A, "RCP SEAL SYS TRBL," entered at 3:39 a.m., directed determining the position of control bleed-off isolation valves CHB-UV-505 and CHA-UV-506 and to reopen if closed. Alarm response Procedure 40AL-9RK3A, "RCP CONT BLEED-OFF PRESS HI-HI," also provided direction to determine if these valve changed position and to reopen if closed, and directed investigating the cause of their closure. The inspectors noted neither Procedure referenced a loss of instrument air as a potential cause for their closure. At 3:48 a.m., alarm response Procedure 40AL-9RK3A, "REAC DRN LOOP TRBL," was entered for the reactor drain tank level of greater than 75 percent. The crew recognized that the associated containment isolation valve CHA-UV-560 was closed but did not associate its closure to a loss of instrument air. At 4:05 a.m. a control room operator observed IAA-UV-002 without indication and the loss of instrument air to the containment was subsequently diagnosed.

Procedure 40AO-9ZZ06, "Loss of Instrument Air," provided guidance to reopen IAA-UV-002 if instrument air is lost to the containment. Step 4 of this procedure provided direction to perform Appendix J, "Aligning N2 to the CTMT Instrument Air Header," if IAA-UV-002 cannot be reopened. Step 7 of Procedure 40AO-9ZZ06 directed the crew to perform Appendix A, "Expected Component Failure as System Pressure Drops." This appendix, page 11 of 36, indicated that the containment isolation valves for the reactor coolant pump bleed-off to the volume control tank will close when containment instrument air pressure drops to between 38 psig and 48 psig.

During their review, the inspectors noted this procedure directed these valves to be manually opened if the reactor drain tank level is greater than 75 percent and the containment is accessible. The reactor drain tank outlet isolation valves close in this same pressure band. The inspectors also noted Procedure 40AO-9ZZ06, Appendix A, was organized by component failures as overall instrument air header pressure drops from the normal value but it did not differentiate containment instrument air header pressure from the system instrument air header pressure. In addition, Appendix A did not prioritize relative importance of each component failure nor did the procedure address time constraints or industrial safety concerns for containment entries. The appendix did not offer alternate strategies if the air operated valves cannot be reopened in a timely manner. In addition, the inspectors noted Appendix J required resources for a containment entry to restore instrument air header pressure inside containment. The body of Procedure 40AO-9ZZ06, "Loss of Instrument Air," did not prioritize actions should the resources for containment entries be limited. With no success path provided by existing procedures, the control room supervisor decided to take the unit off line, trip the reactor coolant pumps, and isolate control bleed-off. The inspectors also noted that removing the reactor coolant pumps from service and isolating control bleed-off were not directed in the loss of instrument air abnormal operating procedure.

Analysis. The performance deficiency associated with this finding involved the failure of operations personnel to adequately establish and implement abnormal operating procedures associated with a loss of instrument air to the containment. The finding is greater than minor because it is associated with the procedure quality attribute of the Initiating Events Cornerstone and affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined

to have very low safety significance (Green) because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to implement the corrective action program with a low threshold for identifying issues [P.1(a)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, procedures used to respond to the loss of instrument air to the containment on December 3, 2009 were inadequate to effectively diagnose and mitigate the off normal event. However, because the finding is of very low safety significance and has been entered into the licensee's corrective action program as PVAR 3411138 and CRDR 3411457, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000528; 05000529; 05000530/2009005-05, "Inadequate Procedures to Diagnose and Mitigate a Loss of Instrument Air to the Containment."

40A5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspectors' observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings of significance were identified.

.2 Temporary Instruction 2515-172, "Reactor Coolant System Dissimilar Metal Butt Welds"

a. Inspection Scope

Portions of Temporary Instruction 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds," were performed at PVNGS, Unit 2, during Refueling Outage U2R15. 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 U2R14 using a weld overlay process, and both were categorized as Category F following the weld overlay process
 - Four 8-inch pressurizer safety nozzles were mitigated during Refueling Outage U2R14 using a weld overlay process, and all were categorized as Category F after the weld overlay
 - Two 16-inch shutdown cooling nozzles were mitigated during Refueling Outage U2R14 using a weld overlay process, and both were categorized as Category F after the weld overlay
 - Four 14-inch safety injection nozzles had ultrasonic examinations during Refueling Outage U2R15 and all were categorized as Category E
 - One 4-inch pressurizer spray nozzle and two 3-inch pressurizer spray nozzles had bare metal visual examinations during Refueling Outage U2R14, no mitigation was performed on the two 3-inch nozzles, and both categorized as Category K. The 4-inch nozzle was mitigated using a weld overlay process during Refueling Outage U2R14, and was categorized as Category F
 - Three 2-inch drain line nozzles had bare metal visual examinations during Refueling Outage U2R14, 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 U2R14, no mitigation was performed, and both were categorized as Category K
- i. Licensee's Implementation of the Materials Reliability Program (MRP-139) Baseline Inspections
- (a) The inspectors reviewed records of structural weld overlays and nondestructive examination activities associated with the licensee's pressurizer and hot leg structural weld overlay mitigation effort. The baseline inspections of the pressurizer dissimilar metal butt welds were completed during the spring 2008 Refueling Outage U2R14.
 - (b) At the present time, the licensee is not planning to take any deviations from the baseline inspection requirements of MRP-139, and all other applicable dissimilar metal butt welds are scheduled in accordance with MRP-139 guidelines.
- ii. Volumetric Examinations
- (a) The inspectors reviewed the four ultrasonic examination records of the unmitigated safety injection nozzles. The inspectors concluded that the ultrasonic examination for these welds was done in accordance with ASME Code, Section XI, "Supplement VIII Performance Demonstration Initiative," 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 safety injection nozzles. 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 examinations of the mitigated nozzles. All personnel records showed that they were qualified under the EPRI performance demonstration Initiative.
- (d) No deficiencies were identified during the nondestructive evaluations.

iii. Weld Overlays

The licensee performed all weld overlays during the previous outage (2R14).

iv. Mechanical Stress Improvement

The licensee did not employ a mechanical stress improvement process.

v. Inservice Inspection Program

The licensee's MRP-139 program is part of their alloy 600 program and future inspections are in accordance with the MRP-139 requirements.

b. Findings

No findings of significance were identified.

.3 Reactor Vessel Head Replacement Inspection (71007)

.3.1 Design and Planning Inspections

a. Inspection Scope

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

i. 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.

ii. 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 lay-down areas.

iii. 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 2R15 outage and additional information is documented in Section 2OS2 of this report.

b. Findings

No findings of significance were identified.

3.2 Reactor Vessel Head Fabrication Inspections at Licensee Facility

a. Inspection Scope

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

i. 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 was 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 the following requirements 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.

ii. Nondestructive Examination (NDE)

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

iii. 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 non-conformance reports; and (6) NDE procedures, NDE records of the welds, NDE personnel qualifications, and certification of the NDE solvents.

iv. 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.

v. 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.

vi. Quality Assurance Program

The inspectors verified 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) that 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.

vii. 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, (preservice inspection) data packages; examined selected manufacturing and inspection records of the finished machined reactor vessel head; and verified compliance with applicable documentation requirements.

b. Findings

No findings of significance were identified.

.3.3 Reactor Vessel Head Removal and Replacement Inspections

a. Inspection Scope

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

i. 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
- Down-ender/up-ender fixture
- Old reactor vessel head removal
- New reactor vessel head placement
- Transport of old reactor vessel head to storage location

ii. Major Structural Modifications

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

iii. 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.

iv. 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.

v. 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 2R15 outage and additional information is documented in Section 2OS2 of this report.

b. Findings

No findings of significance were identified.

.3.4 Post-installation Verification and Testing Inspections

a. Inspection Scope

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 of significance were identified.

4OA6 Meetings, Including Exit

On October 20, 2009, the inspectors presented the results of the Unit 2 Inservice Inspection to Mr. J. Hesser, Vice President Nuclear Engineering, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors acknowledged review of proprietary material during the inspection which had been or will be returned to the licensee.

On October 23, 2009, the inspectors presented the results of the Access Control and ALARA planning inspection to Mr. R. Bement, Vice President, Nuclear Operations, and other members of his staff who acknowledged the findings. In addition, on November 8, 2009 the inspectors conducted a telephonic final exit with Mr. D. Mims, Vice President, Regulatory Affairs and Plant Improvement and other members of staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

On January 6, 2010, the inspector discussed the inspection results of the licensed operator requalification program annual operating test with Mr. C. Brown, Licensed Operator Continuing Training Section Leader. The licensee acknowledged the results. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On January 26, 2010, the inspectors conducted an exit to present the inspection results to Mr. Dwight Mims, Vice President, Regulatory Affairs, and other members of the licensee's management staff. The licensee acknowledged the issues presented. The inspectors noted that while proprietary information was reviewed, none would be included in this report.

On February 3, 2010, the inspectors discussed a change to the inspection results, with Mr. Ron Barnes, Director of Regulatory Affairs, as presented in January 26, 2010. This change was to remove one proposed NCV. The licensee acknowledged the updated information.

40A7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements that meets the criteria of the NRC Enforcement Policy, to be dispositioned as a noncited violation.

- On December 30, 2009, at 12:03 p.m., Palo Verde Nuclear Generation Station declared a Notice of Unusual Event for emergency action level HU1, "Natural phenomena affecting the protected area." Following declaration of the Notice of Unusual Event, the licensee failed to make notifications to State and local governmental agencies within 15 minutes as required by 10 CFR 50.47(b)(5) and 10 CFR Part 50, Appendix E. This event has been documented in the licensee's corrective action program as PVAR 3421043. The finding is of very low safety significance because the Emergency Action Level classification did not exceed a Notice of Unusual Event.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

G. Andrews, Unit 3 Assistant Plant Manager
S. Bauer, Director, Regulatory Affairs
J. Bayless, Department Leader, Engineering Programs
R. Barnes, Director, Regulatory Affairs
R. Bement, Vice President, Nuclear Operations
C. Bonhof, Section Leader, Radiation Protection Technical Services
P. Borchert, Unit 1 Assistant Plant Manager
F. Burdick, Regulatory Affairs
R. Buzard, Section Leader, Compliance
J. Cadogan, Director, Engineering Programs
D. Carnes, Unit 2 Assistant Plant Manager
K. Chavet, Senior Consultant, Regulatory Affairs
L. Cortopossi, Plant Manager, Nuclear Operations
D. Coxon, Unit Department Leader, Operations
T. Dickinson, Senior Technical Advisor, Radiation Protection
E. Dutton, Acting Director of Nuclear Assurance
E. Fernandez, Engineer, Engineering Programs
R. Folley, Engineer, Engineering Programs
J. Gaffney, Director, Radiation Protection
T. Gray, Department Leader, Radiological Support Services
B. Haley, Section Leader, Inservice Inspection/Engineering Programs
D. Hautala, Senior Engineer, Regulatory Affairs
J. Hesser, Vice President, Engineering
G. Hettel, Director, Operations
M. Lacal, Director, Performance Improvement
J. McDonnell, Department Leader, Radiation Protection Operations
D. Mims, Vice President, Regulatory Affairs and Performance Improvement
C. Podgurski, Section Leader, Dosimetry, Radiation Protection
F. Poteet, Senior Engineer, Inservice Inspection Program
T. Radtke, General Manager, Emergency Services and Support
M. Ray, Director, Emergency Planning Programs
H. Ridenour, Director, Maintenance
S. Sawtschenko, Department Leader, Emergency Preparedness
D. Steinsiek, Department Leader, Programs Engineering
J. Summy, Director, Plant Engineering
J. Taylor, Unit Department Leader, Operations
T. Weber, Section Leader, Regulatory Affairs
M. Winsor, Director, Strategic Projects

Nuclear Regulatory Commission

M. Runyan, Senior Reactor Analyst, Region IV

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000528;529;530/2009005-01 NOV Failure to Establish Adequate Procedures to Control Potential Tornado Borne Missile Hazards Near the Essential Spray Ponds (Section 1R15)

Opened and Closed

05000529/2009005-02 NCV Failure to Maintain Containment Closure Capability (Section 1R20)

05000529/2009005-03 NCV Failure to Comply with High Radiation Area Entry Requirements (Section 2OS1)

05000528;529;530/2009005-04 NCV Failure to Periodically Update the UFSAR (Section 2OS2)

05000528;529;530/2009005-05 NCV Inadequate Procedures to Diagnose and Mitigate a Loss of Instrument Air to the Containment (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

In addition to the documents called out in the inspection report, the following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Section 1R04: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40ST-9SI13	LPSI and CS System Alignment Verification	18
40OP-9SI01	Shutdown Cooling Initiation	44
33MT-9EC01	Essential Chiller	10
40OP-9EW02	Essential Cooling Water System	13
40OP-9EC02	Essential Chilled Water Train "B" (EC)	15
40ST-9SI13	LPSI and CS System Alignment Verification	18

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-SIP-001	P and I Diagram Safety Injection and Shutdown Cooling System	44
01-M-SIP-002	P and I Diagram Safety Injection and Shutdown Cooling System	34
01-M-ECP-001	P and I Diagram Essential Chilled Water System	31

1R05: Fire Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
14DP-0FP02	Fire System Impairments and Notifications	14
14AC-0FP05	Pre-Fire Strategies Manual Control	21

MISCELLANEOUS

Updated Final Safety Analysis Report, Section 9.5, Revision 11
Pre-Fire Strategies Manual for Condensate Storage Pump House and Tunnel, Revision 21
Pre-Fire Strategies Manual for Auxiliary Building, Revision 21

Section 1R06: Flood Protection Measures

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40OP-9OP26	Operability Determination and Functional Assessment	2
01PR-OAP04	Corrective Action Program	0
01DP-9ZZ01	Systematic Troubleshooting	6

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-E-ZVU-006	Underground Electrical Duct Layout Plot Plan	33

PALO VERDE ACTION REQUESTS

3397388 3407186 3407186 3344319 3388896 3395895

CONDITION REPORTS / DISPOSITION REPORTS

3411861

WORK ORDERS

3418207 3389954 3398438 3398440 3397408

Section 1R08: In-service Inspection Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73TI-0EE01	Ultrasonic Instrument Calibration	3
73TI-9RC01	Steam Generator Eddy Current Examinations	28
73TI-9ZZ05	Dry Magnetic Particle Examination	14
73TI-9ZZ07	Liquid Penetrant Examination	14
73TI-9ZZ08	High Temperature Liquid Penetrant Examination	13
73TI-9ZZ09	Ultrasonic Examination of Pipe and Vessel Welds	14
73TI-9ZZ10	Ultrasonic Examination of Welds in Ferritic Components	12
73TI-9ZZ79	ASME Section XI Appendix VIII Ultrasonic Examination of Ferritic Piping	6
73TI-9ZZ80	ASME Section XI Appendix VIII Ultrasonic Examination of Austenitic Piping	6
73DP-9WP01	Welder and Procedure Qualification	5
73DP-9WP04	Welding and Brazing Control	13
73DP-9WP05	Weld Filler Material Control	6
73DP-9ZZ17	Repair and Replacement – ASME Section XI	19
73DP-9ZC01	Boric Acid Corrosion Control Program	3
70TI-9ZC01	Boric Acid Walkdown Leak Detection	9
73WP-0ZZ07	Welding of Stainless and Nickel Alloys	14

NON-DESTRUCTIVE EXAMINATION REPORTS

09-UT-2075	09-UT-2076	09-PT-2010	09-PT-2011	09-UT-2055	09-UT-2083
09-UT-2076	09-UT-2077	09-UT-2078	09-MT-2050	09-MT-2051	09-UT-2084
09-MT-2052	09-MT-2053	09-PT-579	09-UT-2081	09-UT-2082	

CONDITION REPORTS / DISPOSITION REPORTS

3282780	3153607	3297425	3163600	3172539	3395895
3221458	3300934	3329999			

WORK ORDERS

3362862

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
107067-006	A and B" Train 24" Pipe Spool Repair (Sump Isolation Valve) Weld Package	October 14, 2009
	Replacement" Steam Generators - Analysts Guidelines Training Manual	9
3191067	Work order for 2PCHAV328 -Seal Weld Body to Bonnet	October 15, 2009
	Unit 2 Inservice Inspection Report Fourteenth Refueling Outage	June 26, 2009
3139194	Inservice Inspection (ISI) Self Assessment,	September 18, 2008
3194996	NEI 03-08 Material Initiative Program Self Assessment	September 24, 2008
3327153	Welding Program Self Assessment Report	July 17, 2009
2968935	Boric Acid Corrosion Control Program Self-Assessment Report,	November 16, 2007
	SG-SGMP-09-12, U2R15 Steam Generator Degradation Assessment	September 25, 2009
	Unit 2 Replacement Steam Generators Condition Monitoring Report	May 9, 2008
	02-MS-B084, Steam Generator Operational Assessment	September 26, 2008
3139187	Steam Generator Management Program Self Assessment Report	March 27, 2009
	102-06061-DEM/RJR , PVNGS Unit 2 Docket No. STN 50-529 Request for Relief from ASME Code Section XI – Relief Request No. 45	September 10, 2009

Section 1R11: Licensed Operator Regualification Program

PALO VERDE ACTION REQUESTS

3413301 3413305 3413452 3413456

MISCELLANEOUS

Simulator Scenario, SES-0-09-M-03, Generator Trip / ESD / LOAF
Simulator Scenario, SES-0-07-H-02, Slipped CEA / LOFC
Simulator Evaluation Summary Sheet, 12/10/09
Form EP-0541, Palo Verde NAN Emergency Message Form, 12/09/09
Palo Verde Nuclear Training Department Remediation Form
Simulator Performance Indicator Evaluation Form, Revision 4

Section 1R12: Maintenance Effectiveness

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01DP-0ZZ01	Operational Decision Making	2
01PR-OAP04	Corrective Action Program	0
40OP-9MB01	Main Generation and Excitation	46
01DP-9ZZ01	Systematic Troubleshooting	6
70DP-0MR01	Maintenance Rule	8

PALO VERDE ACTION REQUESTS

3387675 3394266 3398587

CONDITION REPORTS / DISPOSITION REPORTS

3394672

WORK ORDERS

3394270

MISCELLANEOUS

System Health Report, MB- Excitation and Voltage Regulation, June 30, 2009

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
36MT-9SE11	Excure Control Channel Calibration	28
36ST-9SE13	Excure Startup Channel and Boron Dilution Alarm System Calibration	28
70DP-0RA01	Shutdown Risk Assessments	32

40OP-9ZZ23	Outage GOP	56
32MT-9ZZ82	Time Delay Relay Test	17
40ST-9DG01	Diesel Generator A Test	38
70DP-0RA05	Assessment and Management of Risk When performing Maintenance in Modes 1 and 2	14

PALO VERDE ACTION REQUESTS

3394870 3403001

CONDITON REPORTS / DISPOSITION REPORTS

3403654 3322007 3353708

WORK ORDERS

3394915 3372009 3386576 3334744 3342189 32621546
3066204 3320938

MISCELLANEOUS

<u>TITLE</u>	<u>REVISION / DATE</u>
Operator's Risk Report for Unit 1	October 22 - 23, 2009
Operator's Risk Report for Unit 2	October 7 - 11, 2009
Control Room Alarm Printout	October 22, 2009
Alarm Response Procedure 40AL-9RK4A, Startup and Control Channel Trouble	32
Alarm Response Procedure 40AL-9RK4A, Automatic Motion Inhibit	32
Troubleshooting Game Plan, Three Spurious Spikes Occurred on Unit 3 Excore Control Channel 1	October 26, 2009
Scheduler's Evaluation for Unit 1	September 14 - 21, 2009
Scheduler's Evaluation for Unit 1	October 19 25, 2009
Scheduler's Evaluation for Unit 2	December 7 - 11, 2009
Shutdown Safety Function Assessment Status Sheet	November 9, 2009

Section 1R15: Operability Evaluations

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40DP-9OP26	Operability Determination and Functional Assessment	26
74DP-9CY04	Systems Chemistry Specifications	64
40OP-9CH01	CVCS Normal Operations	58
81DP-0ZY01	Monitoring Outside Areas For Potential Tornado Borne Missile Hazards	4

DRAWINGS

Number	Title	Revision
AO-E-NAB-004	Elementary Diagram 13.8KV Non-Class 1E Power System Start-Up XFMR A-E-NAN-X01 Tripping	8
AO-E-NAB-004	Elementary Diagram 13.8KV Non-Class 1E Power System Start-Up XFMR A-E-NAN-X01 AC Schematic	10
13-M018-00586	Air Inlet Manifold – Emergency Diesel Generator	6
02-M-CHP-002	P and I Diagram Chemical and Volume Control System, Sheet 1	42

PALO VERDE ACTION REQUESTS

3384205	3039770	3395560	3393504	3319258	338904
3399618	339877	3311997	3393377	3389475	3389652
3390604	3398582	3395707	3393776	3361413	3392783
3419429					

CONDITON REPORTS / DISPOSITION REPORTS

3384751

CONDITION REPORT ACTION ITEMS

3392797	3393843	3401239	3401241	3392785	3401243
3401246	3401247	2937383			

WORK ORDERS

3384231	3039808	3395562	3398459	2645454
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ENGINEERING WORK REQUESTS

3381247 3419684

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	TrueGas Sampled Data for AE-NAN-X01	August 30, 2009 through September 28, 2009
VTD-Q011-00001	Qualitrol Electronic Pressure Monitor Model #930-010-01 CS 35551 Instruction Manual	Revision 24298
	DBA Final Report Valspar 84-V-200	October 8, 2009
	Letter from ORNL to Mobile Chemical Company	July 9, 1976
	Letter from Bechtel Power Corporation to Arizona Nuclear Power Project	November 30, 1984
	Memorandum to PVGNS from Corrosion Control Company Consultants and Labs, Inc	April 10, 2009
	Calculation 2005-09080	2
	Valspar product data sheet fro 84-V-2 Clear	
	Memorandum to PVGNS from Enercon	April 17, 2009
	Specification 13-AM-314, Installation for Surface Coating Systems for Concrete	5
	Bacterial Collection Data for Unit 2 Spray Pond A	November 4, 2009
	Technical Evaluation – Ultimate Heat Sink Cooler and Spray Pond Fouling due to Bacterial Growth,	August 27, 2009
	Specification 13-CN-0389, Installation Specification for Control of Tornado Borne Missiles in Outside Areas	0
	Calculation 13-NC-SP-0201, Spray Pond Tornado Missile Damage Frequency	3

Section 1R18: Plant Modifications

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40DP-9OP26	Operations PVAR Processing and Operability Determination / Functional Assessment	26

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
81DP-0DC17	Temporary Modification Control	25
EPIP -99	EPIP Standard Appendices	28
40EP-9EO10	Standard Appendices 101	60
40EP-9EO09	Functional Recovery	40

PALO VERDE ACTION REQUESTS

3390185 3390257

CONDITON REPORTS / DISPOSITION REPORTS

3391177

ENGINEERING WORK REQUEST

3390267

TEMPORARY MODIFICATIONS

3274294 3257865

WORK ORDERS

3269250 3251020

MISCELLANEOUS

<u>TITLE</u>	<u>DATE</u>
Unit 1 TMOD Status Sheet,	October 13, 2009
Technical Issues Briefing Sheet	October 13, 2009
System Engineer/EFIN Response to PVAR 3390185/EWR3390267	October 13, 2009

Section 1R19: Post-Maintenance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73ST-9SI03	Leak Test of Safety Injection / Reactor Coolant System Isolation Valves	44
73ST-9DG02	1E Diesel Generator and Integrated Safeguards Test Train B	20
40OP-9MB01	Main Generation and Excitation	46

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73ST-9XI20	ADV's- Inservice Test	25

PALO VERDE ACTION REQUESTS

3387675	3394266	3398587	3382963	3395864	3393536
3411273	3410425	3407446	3407475	3418163	

CONDITON REPORTS / DISPOSITION REPORTS

3394672	3419262
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WORK ORDERS

3394270	3364810	3241399	3393698	3250960	3410468
3205878	3369024	3407858	3407448	3385202	

MISCELLANEOUS

<u>TITLE</u>	<u>DATE</u>
Permit # 167123, Troubleshoot loss of blue light indication	September 23, 2009
Prompt Human Performance Evaluation Form	September 22, 2009
Personal Statements of Events from Operations Personnel	September 23, 2009
Red Communication for Site Clock Reset	September 24, 2009
Integrated Safeguards Test	October 28, 2009

Section 1R20: Refueling and Other Outage Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
31MT-9RC30	Reactor Vessel Head Removal and Installation	40
31MT-9RC30	Reactor Vessel Head Removal and Installation	41
40OP-9EO01	Standard Post Trip Actions	16
01DP-9ZZ01	Systematic Troubleshooting	6
40OP-9ZZ23	Outage GOP	56
40OP-9ZZ05	Power Operations	131
40ST-9RC01	RCS and Pressurizer Heatup and Cooldown Rates	15
40OP-9SG01	Main Steam	60
40DP-9OP26	Operability Determination and Functionality Assessment	27

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40OP-9FT02	Feedwater Pump Turbine B	32
30DP-9WP02	Maintenance Work Order Process and Control	55
40OP-9CH01	CVCS Normal Operations	58
72ST-9RX14	Shutdown Margin, Modes 3, 4, and 5	15
72PY-9RX04	Low Power Physics Tests Using RMAS	16
40DP-9WP01	Operations Processing of Work Orders	15
40DP-9OP29	Power Block Permit and Tagging	35
02DP-0ZZ02	PVNGS Site Tagging Standard	6
51DP-9OM03	Site Scheduling	23
93DP-0LC05	Regulatory Interaction and Correspondence Control	14
40DP-9OP02	Conduct of Shift Operations	49
70DP-0RA03	Probabilistic Risk Assessment Model Control	6
71DP-0EM01	Risk Management Program Expert Panel	9
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	13
40OP-9ZZ04	Plant Startup Mode 2 to Mode 1	56
70DP-0RA01	Shutdown Risk Assessments	32
40OP-9ZZ11	Mode Change Checklist	80
70TI-9ZC01	Boric Acid Walkdown Leak Detection	9

PALO VERDE ACTION REQUESTS

3411749	3411819	3412268	3412244	3412243	3412222
3412110	3412021	3411338	3411374	3411138	3411229
3411137	3386786	3386784	3388733	3388309	3388652
3388536	3388573	3403493	3403408	3401421	3386683
3389625	3390332	3386684	3386683	3400561	3390317
3389284					

CRDRs

3404363 3404374 3390784

CRAIs

3404375

WORK ORDERS

9401914 3401915

TAGGING PERMITS

165952 165843 165845 168253 167699 166016
167833 166015 166007 165607

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	2R15 Refueling Outage Probability Risk Assessment	
	2R15 Refueling Outage Maintenance Overview Schedule	
	Control Room Logs	October 2, 2009
	Control Room Logs	October 3, 2009
Technical Specification 5.5.16	Containment Leakage Rate Testing Program	
Technical Specification 3.6.1	Containment	
Technical Specification 3.6.3	Containment Isolation Valves	
Technical Specification 3.9.3	Containment Penetrations	
	Fuel Handling Event Recovery Checklist	November 13, 2009
	Personnel Statements from fuel moving crew	November 13, 2009
	Technical Issues Briefing Sheet Refueling Pool Clarity Iron and Copper	November 7, 2009
	Regulatory Guide 1.163, Performance-Based Containment Leak-Test Program	

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Boric Acid Walkdown Inspection Summary and Results	, October 3, 2009
IP 71111.20"	NRC Operating Experience Smart Sample (OpESS) FY 2007-03, "Crane and heavy lift inspection, supplement guidance	
	Technical Specification Component Condition Report	May, 19, 2009
	Night Order	October 9, 2009
	Control room Logs	October 8, 2009 through October 9, 2009
	UFSAR Section 3.8	11
	UFSAR Section 6.2.1	11

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73ST-9SP02	Essential Spray Pond Pumps – Comprehensive Pump Test	3
72PY-9RX04	Low Power Physics Tests	18
01PR-0AP04	Corrective Action Program	0
90DP-0IP10	Condition Reporting	18
73ST-0XI04-1	SI Train B Valves-Inservice Test	25

WORK ORDERS

3387348 3250713

Section 2OS1: Access Controls to Radiologically Significant Areas

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75DP-0RP01	Radiation Protection Program Overview	8
75DP-0RP02	Radiation Contamination Control	15

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75DP-9RP01	Radiation Exposure and Access Control	16
75RP-0RP01	Radiological Posting and Labeling	28
75RP-9RP01	Radiation Exposure and Access Control	15
75RP-9RP07	Radiological Surveys and Air Sampling	19
75RP-9RP10	Conduct of Radiation Protection Operations	30
75RP-9OP02	Control of High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas	24

WORK ORDERS

3387348 3250713

PALO VERDE ACTION REQUESTS

3393861 3393937 3394165 3395113 3397279

CONDITION REPORTS / DISPOSITION REPORTS

3311917	3313137	3315758	3315854	3317030	3337883
3328940	3329007	3329010	3329791	3329969	3354528
3393042	3395711	3360300	3379555	3383924	3394172
3384503	3384503	3394172	3395711	3393042	

RADIATION EXPOSURE PERMITS, IN-PROGRESS REVIEWS, POST-JOB REVIEWS

<u>NUMBER</u>	<u>TITLE</u>
2-1265	Remove/Replace CEA Extension
2-1365	Reactor Drain Tank Repair and Replacement
2-1403	Reactor Coolant Pump Diffuser and Suction Pipe Inspections
2-1424	3-Dimensional Laser Scanning/Templating
2-3000	Control Element Assembly Replacement
2-3002	Reactor Destack and Restack
2-3006	Reactor Vessel Head Penetration Inspection
2-3306	Primary Side Steam Generator Maintenance
2-3320	Remove and Replace Reactor Coolant Pump 1A Impeller and Seal Assembly
2-3412	Pressurizer Heater Cut Out and Replacement

Section 2OS2: ALARA Planning and Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75DP-0RP03	ALARA Program Overview	4
75DP-0RP06	ALARA Committee	5

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
75RP-9RP12	ALARA Reports	3
75RP-9RP15	Control and Storage of Radioactive Material and Radioactive Waste	21

RADIATION EXPOSURE PERMITS, IN-PROGRESS REVIEWS, POST-JOB REVIEWS

<u>NUMBER</u>	<u>TITLE</u>
3-1422	Perform Reactor Coolant System Nozzle Weld Overlays
3-3000	Control Element Assembly Replacement
3-3002	Reactor Destack and Restack
3-3045	Reactor Vessel Head Penetration Inspection
3-3306	Primary Side Steam Generator Maintenance

MISCELLANEOUS

Unit 3 Refueling Outage 14 ALARA Summary Report
S-02-0097, 10 CFR 50.59 for Old Steam Generator Storage Building
S-02-0424, 10 CFR 50.59 for Unit-2 Old Steam Generators
S-08-0372, 10 CFR 50.59 for Old Reactor Vessel Head Building
S-09-0254, 10 CFR 50.59 for Old Reactor Vessel Head, Radiological Decommissioning Review, September 2009
Old Steam Generator Drop Dose Analysis
Old Reactor Vessel Head Drop Dose Analysis
PV Reactor Vessel Head Characterization Survey Protocol

Section 40A1: Performance Indicator Verification

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70DP-0PI01	Performance Index Data Mitigating System Cornerstone	4
75RP-0LC01	Performance Indicator Occupational Radiation Safety Cornerstone	2
75RP-0LC02	Performance Indicator Public Radiation Safety Cornerstone	1

MISCELLANEOUS

Interviews with personnel on November, 20, 2009
Control room logs from September 2009 through November 2009
Unavailability report data from September 2008 through September 2009

Section 40A2: Identification and Resolution of Problems

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
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01DP-0AC06	Site Integrated Business Plan/Site Integrated Improvement Plan Process	11
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

3397224	3418201	3418174	3418452	3418441	3418431
3418422	3418404	3418353	3418163	3417573	3417248
3036970	3416748	3416563	3407053		

CONDITION REPORTS / DISPOSITION REPORTS

3325283	3038288	3404325	3298555	3301283	3308290
3335049	3365692	3392342	3332710	3408018	

CONDITION REPORTS ACTION ITEMS

3404326

WORK ORDERS

3093249 3303043

MISCELLANEOUS

<u>TITLE</u>	<u>DATE</u>
System Health Report, GT-Gas Turbine Generators (Station Blackout Generators)	January 1, 2009 through June 30, 2009
PVNGS System Health Report Executive Summary	January 1, 2009 through June 30, 2009
Condition Reporting Trend Report 3 rd Quarter 2009	December 2, 2009
Condition Reporting Trend Report 2 nd Quarter 2009	September 2, 2009
Palo Verde Nuclear Generating Station Monthly Trend Report	November 2009
Operations / Refueling Outage Audit Report 2009-010	

MISCELLANEOUS

TITLE DATE

Unit 2 Control Room Log July 11, 2007

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01DP-9ZZ01	Systematic Troubleshooting	6
40AO-9ZZ06	Loss of Instrument Air	30
40DP-9OP26	Operability Determination and Functionality Assessment	27
43AL-3RK1A	Window 1A04A, 125V IE CC M41 CHGR A/AC PNL D21 TRBL	39
40AO-9ZZ02	Excessive Reactor Coolant System Leakrate	13
40AL-9RK3A	Window 3A10A, LD SYS TRBL	24
40AO-9ZZ05	Loss of Letdown	18
40AO-9ZZ05	Loss of Letdown	19
40AL-9RK3A	Window 3A11A, RCP SEAL SYS TRBL	24
40EP-9EO07	Loss of Offsite Power/Loss of Forced Circulation	22
40AL-9RK3A	Window 3A12B, RCP CONT BLEED-OFF PRESS HI-HI	24
40AO-9ZZ04	Reactor Coolant Pump Emergencies	21
40AL-9RK4A	Window 4A02A, RCP 1A TRBL	32
90DP-0IP06	Reactor Trip Investigation	16
40AL-9RK3A	Window 3A08A, CHG HDR SYS TRBL	24
40AL-9RK3A	Window 3A07A, REAC DRN LOOP TRBL	24
40AL-9RK3A	Window 3A07B, REAC DRN TK PRESS HI	24
AC-0753	Plant Review Board	0
79IS-9SM01	Analysis of Seismic Event	21
40A)-9ZZ21	Acts of Nature	26

PALO VERDE ACTION REQUESTS

3411749	3411819	3412268	3412244	3412243	3412222
3412110	3412021	3411338	3411374	3411138	3411229
3411137					

MISCELLANEOUS

<u>TITLE</u>	<u>REVISION / DATE</u>
3M15 Maintenance Outage Probability Risk Assessment	
3M15 Maintenance Outage Maintenance Overview Schedule	
Technical Specification 3.6.1, Containment	
Technical Specification 3.6.3, Containment Isolation Valves	

MISCELLANEOUS

<u>TITLE</u>	<u>REVISION / DATE</u>
Technical Specification 3.9.3, Containment Penetrations	
Technical Specification 3.4.14, Reactor Coolant System Operational Leakage	
Unit 3 Plant Performance, Safety Function, and PPS Response Evaluation	December 3, 2009
Post Trip Turbine Building Walkdown Evaluation	December 3, 2009
Safety Assessment of Unit 3 Manual Reactor Trip	December 3, 2009
Control Systems Response Evaluation for the Unit 3 Manual Reactor Trip	December 3, 2009
Plant Transient Review Assessment for the Unit 3 Manual Reactor Trip	December 3, 2009
Generic Letter 88-14, Instrument Air Supply System Problems Affecting Safety-Related Equipment	
PVNGS Emergency Plan	
Event History Report, Unit 3	December 3, 2009
Plant Computer Print Out, Unit 3	December 3, 2009
Operator Logs, Unit 3	December 3, 2009
Operator Logs, Unit2	December 30, 2009
Trend Graphs, Unit 3	December 3, 2009
Licensed Operator Continuing Training 2009-2010 Two Year Schedule,	1
Licensed Operator Continuing Training -Training Program Description	53

Section 4OA5: Other Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
MRS-SSP-2349	RRVCH Preps/Installation of Lower SHA Arrangement/Install Dome Insulation (Transco) for Palo Verde Unit 2	1
MRS-SSP-2350	Remove and Reinstallation of Components from ORVCH to RRVCH	1
MRS-SSP-2352	Installation of the Replacement Reactor Vessel Closure Head Flange Insulation	1
MRS-SSP-2490	Fuel Transfer System Control Console Installation	0
PS-PGN-103	General Intermediate and Final Post Weld Heat Treatment Procedure for Replacement Reactor Vessel Closure Head and Control Element Drive Mechanism	2
DS-ECT-01	Eddy Current Imaging Procedure for Inspection of RVH Penetrations	4
DS-UT-01	Ultrasonic Acquisition Procedure for RVH Penetrations	5
PP-NDE-013	NDE Program Plan – Palo Verde Replacement RV Closure Head and CEDM Unit 1,2, and 3	3
PP-NDE-014	Replacement Reactor Vessel Head PSI Plan – Palo Verde Replacement RV Closure Head and CEDM Unit 1, 2, and 3	2
PS-N05065V1	Visual and Dimensional Inspection Procedure	0
EPAV1102	Visual (VT-1, VT-3) Examination Procedure for Palo Verde 1, 2, and 3 RRVCH	0
QM-200	Quality Assurance Manual for ASME III and KEPIC-MN and SN Construction and Material Organization Applications	17
QM-200	Quality Assurance Manual for ASME III and KEPIC-MN and SN Construction and Material Organization Applications	16
QM-200	Quality Assurance Manual for ASME III and KEPIC-MN and SN Construction and Material Organization Applications	14
QM-200	Quality Assurance Manual for ASME III and KEPIC-MN and SN Construction and Material Organization Applications	13
QM-200	Quality Assurance Manual for ASME III and KEPIC-MN and	12

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	SN Construction and Material Organization Applications	
QM-200S1	Supplement to the Quality Assurance Manual (QM-200) for 10 CFR 50 Appendix B, ASME NQA-1 and ANSI N45.2 Applications	0
PS-PGN-101	General Welding Procedure for Replacement Reactor Vessel Closure Head and Control Element Drive Mechanism	1
PS-PGN-102	General Repair Welding Procedure for Replacement Reactor Vessel Closure Head and Control Element Drive Mechanism	1
MRS-SSP-2367	Assembly/Disassembly of ECHD and Assembly/Disassembly of Erection Crane Inside Protected Area	0
MRS-SSP-2366	Assemble/Disassemble Assembly Crane at RRVCHSR, Up-end RRVCH/Remove Shipping Container and Stage in RRVCSF, Install SHA and Transport/Stage RRVCH at Equipment Hatch	1
MRS-SSP-2349	RRVCH Preps/Installation of Lower SHA Arrangement/Install Dome Insulation (Transco) for Palo Verde Unit 2	1
31MT-9RC30	Reactor Vessel Head Removal and Installation	41
8302.0002.0000	Operating Instruction for the Multiple Stud Tensioner (MST)	0
MRS-SSP-2360	Installation of Upper Shroud and Lift Rig	1
31MT-9RC01	Reactor Vessel Ventilation, Cable Support Structure and Insulation Removal and Installation	34
BIGGE 02271-P7	Component Load Test Qualification Procedure	1
BIGGE 02271-P4	Procedure To Remove The Old RVH From The Reactor Containment Building (RCB)	2
BIGGE 02271-P5	Procedure To Install The New RVH In The Reactor Containment Building (RCB)	2
BIGGE 02271-P6	Procedure To Move Old RVH To The Old Reactor Vessel Head Storage Facility (ORVHSF)	2
BIGGE-02271-P3	Procedure To Install And Remove Elevated Cantilever Handling Device (ECHD) And Heavy Lift Crane	3
BIGGE-02271-P2	Procedure To Install Lower Shroud	2

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
BIGGE-02271-P1	Procedure To Upend New RVH	2
30DP-0MP10	Mobile Crane Activities	17
30DP-9MP11	Rigging Field Use	28
30DP-9MP13	Rigging Control	6
30DP-9MP03	FME Control	15
31MT-9ZC07	Miscellaneous Containment Building Heavy Loads	28

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
10035E86	Palo Verde Units 1, 2, and 3 SHA Riser Duct and Platform Assembly Installation	0
BIGGE 06E24-30	Lower Fixed Runway Elevation View RVCH Replacement Project APS-Palo Verde Nuclear Station, Sheets 1 through 8	2
BIGGE 06E24-4	E.C.H.D. Major Component Erection Plan View RVCH Replacement Project APS-Palo Verde Nuclear Station, Sheets 1 through 9	0
BIGGE Job 2271 DWG 6.0	Install New R.V.C.H. Isometric View	1
BIGGE 06E24-41	Elevated Cantilever Handling Device Elevation View	3
Westinghouse PVSHA-024	Palo Verde Units 1, 2, and 3 Old ACU Lift Rig Removal Rigging Plan	0
Westinghouse PVSHA-021	Palo Verde Chimney/Damper Removal Rigging Plan	A
Westinghouse PVSHA-030	Palo Verde Units 1, 2, and 3 West Missile Shield Duct Removal Rigging Plan	0
Westinghouse PVSHA-023	Palo Verde Collector Ring Support Structure Removal Rigging Plan	0
Westinghouse PVSHA-027	Palo Verde 181'-0 Platform Beam Removal Rigging Plan	0
Westinghouse PVSHA-014	Palo Verde Units 1, 2, and 3 Tripod Assembly (OLD) Rigging Plan	0
Westinghouse PVSHA-013	Palo Verde Units 1, 2, and 3 Lift Rig Assembly (OLD) Rigging Plan	0

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
Westinghouse PVSHA-029	Palo Verde Units 1, 2, and 3 East and West Riser Duct Removal Rigging Plan	
Westinghouse 10019E32	21,500 lb Circular Lifting Rig Assembly	2
Westinghouse 10034E05	Palo Verde Units 1, 2, and 3 SHA Lower Shroud Assembly	1
Westinghouse 100334E04	Palo Verde Units 1, 2, and 3 SHA RV Head and Lower Shroud Assembly	1

PALO VERDE ACTION REQUESTS

3397323	3388189	3373828	3377080	3371174	3407979
3405513	3405437	3385220	3390566		

VENDOR CORRECTIVE ACTION REPORT (VCAR)

VC-DHI1-08-053	VC-DHI1-08-056	VC-DHI1-08-057	VC-DHI1-08-059
VC-DHI1-08-060	VC-DHI1-08-062	VC-DHI1-08-063	VC-DHI1-08-026
VC-DHI1-08-051	VC-DHI1-08-038	VC-DHI1-08-054	VC-DHI1-08-055
VC-DHI1-08-058	VC-DHI1-08-027	VC-DHI1-07-028	VC-DHI1-07-023
VC-DHI1-07-009	VC-DHI1-07-010	VC-DHI1-07-018	VC-DHI1-07-019
VC-DHI1-09-002			

WORK ORDERS

3234508	3234509	3190342	3260625	3233797	3260628
2992340	3095435	3234469	2292760	2992340	3233786
3233804	3270435	3234457	3234460	3234462	3234464
3234466	3234471	3234516	3255281	3256171	3311953
3260610	3234513	3371805	3234413	3377051	3261505
3234456	3234475	3234455	3377053	3266041	3234470
3260621	3255282	3255285	3270435	3234474	3255284
3255281	3234453	3260622	2992340	3095435	

WELDING PROCEDURE SPECIFICATIONS

A-A-0308-139	A-A-0308-140	A-A-0308-141	A-F-0308-113	A-T-0308-121
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50.59 Screens/Evaluations

E-09-0006	S-08-0372	E-09-0008
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CALCULATIONS

<u>TITLE</u>	<u>REVISION</u>
PV-111CN-900, Palo Verde RRVCH ASME Section XI Code Reconciliation Methodology	2
PV-132CN-011, Palo Verde Units 1, 2, and 3 RCEDM ASME Section XI Code Reconciliation Methodology	1
13-NC-ZY-0295, Reactor Vessel Head Drop Dose Analysis	1
2271-C2.1, Elevated Cantilever Handling Device (ECHD)	0
2271-C7.1, Ground Loading	0
CN-MRCDA-09-51, APS RV Vent Line Repair	0
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

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
13-MN-741	Technical Specification for Control Element Drive Mechanisms for Palo Verde Nuclear Generating Station Units 1, 2, and 3	1
13-MN-740	Technical Specification for Replacement Reactor Vessel Heads for Palo Verde Nuclear Generating Station Units 1, 2, and 3	1
AHTR-RRVCH-01	Accumulated Heat Treatment Time Record	May 18, 2009
PWHT-08-050	Heat Treatment Record	June 10, 2008
MRS-SSP-2364	Remove and Re-install Equipment Closure Hatch	
MRS-SSP-2351	Packaging, RP Prep For Removal ORVCH	
MRS-SSP-2353	Remove and Modify RCS Vent Line	
PWHT-07-093	Heat Treatment Record	October 15, 2007

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
DS-ME-06-3	Design Specification for the Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Head (RRVCH)	5
500297092	Quality Verification Documentation - Replacement Reactor Vessel Closure Head (RRVCH) and Control Element Drive Mechanisms,– Volume 1 of 8	0
500297092	Quality Verification Documentation - Replacement Reactor Vessel Closure Head (RRVCH) and Control Element Drive Mechanisms – Volume 2 of 8	0
DAR-MRCDA-07-8	Palo Verde Nuclear Generating Station Units 1, 2, and 3 – RVLMS	3
PV-111AR-001	Design Report of Palo Verde Units 1, 2, and 3 RRVCH	12
PV-132AR-001	Design Report of Palo Verde Nuclear Power Plant Units 1, 2, and 3 Replacement CEDM	1
A-DHI1-08-12	PBSA Worksheet – Reactor Vessel Heads, Control Element Drive Mechanisms (CEDMs),	31
A-DHI1-08-12	Doosan Triennial Audit – Technical Specification Observations	December 11, 2008
A-DHI1-08-12	Nuclear Procurement Issues Committee Audit Checklist	13
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SV-DHI1-06-020	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	December 18, 2006
SV-DHI1-07-004	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Head – Bar, Nicrofer 6030 (Alloy 690) for RRVCH Nozzles	March 15, 2007

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SV-DHI1-07-005	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	April 11, 2007
SV-DHI1-07-0	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	April 13, 2007
SV-DHI1-07-009	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	July 12, 2007
SV-DHI1-07-013	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	September 13, 2007
SV-DHI1-07-014	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	September 19, 2007
SV-DHI1-07-019	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	December 5, 2007
SV-DHI1-08-002	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	February 9, 2008
SV-DHI1-08-006	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	April 2, 2008
	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

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<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
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	Lift Rig Assembly Load Test Record	0
	Tripod Assembly Load Test Data For 1,388,000 lb Test	July 30, 2009
	Simplified Head Assembly Radwaste Disposal Plan	
02271-G1	Project Execution Plan	
	Liebler Crawler Crane LR 1300 Operating Manual	
	Spill Prevention and Response Plan for Field Operators	
	BIGGE Power Constructors, Palo Verde Nuclear Station Job 02271 – Training Matrix	October 15, 2009
SV-DHI1-08-007	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	April 10, 2008
SV-DHI1-08-013	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	July 9, 2008
SV-DHI1-08-017	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	September 19, 2008
SV-DHI1-08-020	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	October 31, 2008
SV-DHI1-08-022	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	December 24, 2008

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<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SV-DHI1-09-001	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	February 6, 2009
SV-DHI1-09-002	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	March 26, 2009
SV-DHI1-09-004	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	June 2, 2009
SV-DHI1-09-005	Oversight of Palo Verde Units 1, 2, and 3 Replacement Reactor Vessel Closure Heads and Control Element Drive Mechanisms (CEDM)	May 28, 2009
RVHR/SHA	Radwaste Offload Plan	
	Westinghouse Head Replacement and SHA Upgrade, PVNGS Material Disassembly and Removal	1
	BIGGE Drawing Transmittal Log	13
500522911-FDR-01	Field Deviation Report	September 11, 2009
901108-OP-001	Operational Procedure Vent Line Repair Cold Bending Tool-Palo Verde	0
09-446	U2 RV Head Vent Line Coupling DM Weld and CEDM 89 Liquid Penetrant Examination Report	September 12, 2009
	Engineering Disposition for ENG-DM 3190342 Reactor Vessel Closure Head Haul Route	
	Head Lift Rig Assembly Load Test Data	August 3, 2009
	Reactor Vessel Closure Head Haul Route, Design Input Requirements Checklist	0