



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

August 11, 2011

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

**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION -- NRC INTEGRATED
INSPECTION REPORT 05000528/2011003, 05000529/2011003, and
05000530/2011003**

Dear Mr. Edington:

On June 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed integrated inspection report documents the inspection findings, which were discussed on July 1, 2011, with Mr. B. Bement, Senior Vice President, Site Operations, and other members of your staff.

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

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The NRC has also identified five additional issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that violations are associated with four of these five additional issues. Additionally, four licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the

NRC Resident Inspector at the facility. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response, if you choose to provide one, 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 Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

Ryan Lantz, Chief
Project Branch D
Division of Reactor Projects

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

Enclosure:
NRC Inspection Report 05000528/2011003, 05000529/2011003, and 05000530/2011003
w/Attachment: Supplemental Information

cc w/Enclosure: Distribution via Listserv

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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
SRI:DRP/	RI:DRP/	RI:DRP/	SPE:DRP/	C:DRS/EB1	C:DRS/EB2
TBrown	JBashore	MBaquera	DAllen	TRFarnholtz	NFO'Keefe
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C:DRS/OB	C:DRS/PSB1	C:DRS/PSB2	AC:DRS/TSB	C:DRP/D	
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

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

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

Report: 05000528/2011003, 05000529/2011003, 05000530/2011003

Licensee: Arizona Public Service Company

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

Location: 5951 South Wintersburg Road
Tonopah, Arizona

Dates: April 1 through June 30, 2011

Inspectors: M. Brown, Senior Resident Inspector
J. Bashore, Resident Inspector
M. Baquera, Resident Inspector
P. Elkmann, Senior Emergency Preparedness Inspector
G. Guerra, Emergency Preparedness Inspector
S. Hedger, Operations Engineer
G. George, Senior Reactor Inspector
J. Adams, Ph.D., Reactor Inspector

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

SUMMARY OF FINDINGS

IR 05000528/2011003, 05000529/2011003, 05000530/2011003; 04/01/2011 – 06/30/2011; Palo Verde Nuclear Generating Station, Integrated Resident and Regional Report; ISI Activities, Plant Mods., Exercise Evaluation and Ident. & Res. of Prob.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. Five Green findings, four associated with noncited violations, and one Severity Level IV noncited violation of significance 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." The cross-cutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. Inspectors reviewed a Green self-revealing finding for failure to properly repair a 13.8kV cable associated with the AENANX02 startup transformer. Specifically, the work performed failed to achieve an acceptable level of quality as required by Procedure 30DP-9MP01 "Conduct of Maintenance," and as a result the splice failed causing valid actuations of the emergency diesel generators due to a partial loss of offsite power to both Unit 1 and Unit 3. The licensee plans to revise Specification 13-EN-306, "Installation Specification for Cable Splicing and Terminations for PVNGS," to remove the use of taped splices for 13.8kV cable. The licensee entered this issue into the corrective action program as Condition Report / Disposition Requests 3616634.

The failure of the licensee to perform work with an acceptable level of quality for 13.8kV cable splicing was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it adversely affected the equipment reliability attribute of the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Screening and Characterization of Findings," the inspectors concluded that the finding is of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. This finding had a cross-cutting aspect in the area of human performance associated with the resources component because the licensee failed to provide complete, accurate and up-to-date procedures and work packages for splicing of 13.8kV electrical cable [H.2(c)](Section 4OA2).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states "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, from March 11 through April 19, 2011, the licensee failed to complete an immediate operability determination in accordance with Procedure 01PR-0AP04, "Corrective Action Program," when the licensee discovered the system leakage test methodology for the diesel fuel oil transfer system did not conform to ASME Code, Section XI testing requirements. This condition was placed in the corrective action program as Palo Verde Action Requests 3704003.

The inspectors determined that the failure to complete an immediate operability determination in accordance with paragraph 3.2.1.5 of Procedure 01PR-0AP04 was a performance deficiency. The performance deficiency is more than minor because the nonconforming condition created a reasonable doubt on the operability of the diesel fuel oil transfer system. Using Phase 1 of NRC Manual Chapter 0609, "Significance Determination Process," the finding screens as having very low safety significance (Green) because the finding is a design or qualification deficiency confirmed not to result in the loss of operability or functionality of the system. The finding has a cross-cutting aspect in the area of problem identification and resolution, associated with the corrective action program component, because the licensee failed to identify issues completely, accurately, and in a timely manner commensurate with their safety significance. Specifically, the licensee failed to accurately document the nonconforming condition identified in Palo Verde Action Requests 3654452 which led to a failure to complete an immediate operability determination as required [P.1(a)](Section 1R08.5).

Cornerstone: Barrier Integrity

- Green. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, that "Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." Specifically, Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 11 did not include appropriate screening criteria to satisfactorily evaluate boric acid leaks and deposits that may cause degradation of risk significant system barriers. The condition was placed in the corrective action program as Palo Verde Action Request 3691351.

The inspectors determined the failure to include appropriate screening criteria into Procedure 70TI-9ZC01 was a performance deficiency. The performance deficiency is more than minor because it is associated with the procedure quality attribute of the Barrier Integrity Cornerstone and adversely affects the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Phase 1 of NRC Manual Chapter 0609, "Significance Determination Process," the finding screens as having very low safety significance (Green) because the finding does not represent a degradation of a radiological barrier, does not represent a degradation of the control room toxic barrier functions, does not represent an actual open pathway of reactor containment, and does not involve an actual degradation of hydrogen igniters in the reactor containment. The finding includes a cross-cutting aspect in the area of problem identification and resolution, associated with the corrective action program component, because the licensee failed to take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity. Specifically, the licensee identified similar deficiencies in the self assessment of the boric acid program in September 2010 however, failed to take appropriate corrective actions to fully correct the identified deficiencies [P.1(d)](Section 1R08.3).

- Severity Level IV. The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.73(a)(1) for failure to submit a Licensee Event Report within 60 days following discovery of a condition prohibited by Technical Specifications. The licensee made a procedure change in 1986 to Procedure 41OP-1HJ01, "Control Room Handswitch/Valve Checklist," to maintain control room outside air dampers normally closed instead of the normally open position stipulated in the final safety analysis report. The inspectors concluded that the incorrect alignment of the dampers was a condition prohibited by Technical Specification 3.3.9, "Control Room Essential Filtration Actuation Signal" and that the licensee failed to adequately evaluate the issue for reportability. The licensee entered the issue into the corrective action program as Palo Verde Action Request 3791486.

The inspectors concluded the failure of Arizona Public Service to report a condition prohibited by Technical Specifications was a performance deficiency. The inspectors evaluated this performance deficiency using the traditional enforcement process because the failure to submit a required report affected the NRC's ability to perform its regulatory function. Consistent with the guidance in Section 2.2.2 and Section 6.9.d of the NRC Enforcement Policy, the inspectors concluded the finding was a Severity Level IV violation because the licensee failed to make a timely written report that resulted in no or relatively inappreciable potential safety consequences (Section 1R18).

- Green. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion VII "Control of Purchased Material, Equipment, And Services" for the failure of licensee personnel to maintain radiographs onsite for the verification of ASME Code, Section III compliance. Specifically, radiographs

for welds associated with the reactor head vent line were neither received nor reviewed as required. When the radiographs were obtained, reviews identified that welds for Units 1 and 2 did not meet the standards of Section III of the ASME Boiler and Pressure Vessel Code. The licensee corrected the non-conforming weld in Unit 2 during refueling outage 2R16 and Unit 1 welds will be restored to Section III standards during the next refueling outage beginning October 1, 2011. The licensee entered the issue into the corrective action program as Condition Report / Disposition Requests 3540575.

Inspectors determined that the failure to maintain radiographs onsite for review was a performance deficiency. The performance deficiency was more than minor because it adversely affected the RCS equipment and barrier performance attribute of the Barrier Integrity Cornerstone's objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Screening and Characterization of Findings," the inspectors concluded that the finding is of very low safety significance (Green) because the reactor coolant system barrier remained intact, was not associated with the fuel barrier, and did not constitute a spent fuel pool issue. This finding had a cross-cutting aspect in the area of human performance associated with the work practices component because the licensee failed to communicate expectations regarding procedural compliance and personnel follow procedures [H.4(b)](Section 4OA2).

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a Green noncited violation for failure to critique weak performance in the Technical Support Center during a biennial exercise conducted March 1, 2011, as required by 10 CFR Part 50, Appendix E, IV(F)(2)(g). Specifically, the licensee did not identify that the Technical Support Center did not understand the radiological release path and that they had developed ineffective mitigation strategies based on their inaccurate understanding.

This performance deficiency is more than minor because it affected the emergency preparedness cornerstone and was associated with the emergency response organization performance attribute. The finding had a credible impact on the emergency preparedness cornerstone objective because a lack of understanding of the release path for radioactive material affects the licensee's ability to implement adequate measures to protect the health and safety of the public. The finding was evaluated using the emergency preparedness significance determination process and was determined to be of very low safety significance (Green) because it was a failure to comply with NRC requirements, was associated with Emergency Planning Standard 50.47(b)(14), was not a risk significant planning standard issue, and was not a functional failure of the planning standard. The issue was entered into the licensee's corrective action

program as Condition Report / Disposition Requests 3693235. This finding was assigned a cross-cutting aspect in the area of problem identification and resolution because the licensee failed to identify a performance issue completely and accurately [P.1(a)](Section 1EP1).

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers (condition report numbers) are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at essentially full power during the inspection period. Unit 2 entered the inspection period at essentially full power and was shut down for refueling outage 16 on April 1, 2011. Unit 2 returned to essentially full power on May 11, 2011 and remained there for the remainder of the inspection period. Unit 3 operated at essentially full power during the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Summer Readiness for Offsite and Alternate-ac Power

a. Inspection Scope

On June 2, 2011 the inspectors performed a review of preparations for summer weather for selected systems for all three units, including conditions that could lead to loss-of-offsite alternating current (ac) power and conditions that could result from high temperatures. The inspectors reviewed the procedures affecting these areas and the communication protocols between the transmission operator and the plant to verify that the appropriate information was being exchanged when issues arose that could affect the offsite power system. Specifically inspectors verified that; procedures address actions to be performed when grid voltage is unacceptable for operation of safety related loads, compensatory actions are identified if grid voltage is unable to be predicted for current conditions, maintenance activities that affect grid reliability are assessed for plant risk, and that communication protocols between the plant operator and the transmission system operator were adequate.

The inspectors focused on verifying procedures address measures to monitor and maintain availability and reliability of both the offsite ac power system and the onsite alternate ac power system. Inspectors also focused on plant specific design features and procedures used by plant personnel to mitigate or respond to seasonal high temperature conditions. Inspectors performed a walk down of the ac power distribution systems, including the switchyard and major transformers, to assess the material condition of both the offsite and onsite ac power systems. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection and verified that operator actions were appropriate as specified by plant specific procedures. Inspectors also reviewed corrective action program documents to verify the licensee was identifying issues at an appropriate threshold. Specific documents reviewed during this inspection are listed in the attachment. The inspector's reviews focused specifically on the systems in the following locations:

- Non essential 13.8 kV and 4160 Vac distribution system including a walk down of the unit auxiliary transformers and the normal service transformers for each unit
- Essential 4160 Vac distribution system, including the engineered safety feature (ESF) transformers and switchyard tour

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

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of the adverse weather procedures for seasonal extreme high temperatures. The inspectors verified that weather related equipment deficiencies identified during the previous year were corrected prior to the onset of seasonal extreme temperatures. Inspectors also evaluated the implementation of seasonal extreme temperature preparations and compensatory measures for any affected conditions.

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

- June 26, 2011, Units 1, 2, and 3, ultimate heat sink
- June 24, 2011, Unit 2, spray pond system trains A and B

These activities constitute completion of one readiness for seasonal extreme weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- April 11-12, 2011, Unit 2, spent fuel pool cooling alignment verification
- May 19, 2011, Unit 2, auxiliary feedwater alignment verification
- June 2, 2011, Unit 1, low pressure safety injection, train B, alignment verification
- June 20, 2011, Unit 3, auxiliary feedwater system, AFW pumps AFA-P01 and AFB-P01, alignment verification

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

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

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On April 21, 2011, the inspectors performed a complete system alignment inspection of the Unit 2, high pressure safety injection, train A, to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, 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.

Additional activities were performed during this system walkdown that were associated with TI 2515/177, "Managing gas accumulation in emergency core cooling, decay heat removal, and containment spray systems." These activities are described in paragraph .3 of this section. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

On April 21, 2011, the inspectors conducted a walkdown of high pressure safety injection system train A, in sufficient detail to reasonably assure the acceptability of the licensee's walkdowns (TI 2515/177, Section 04.02.d). The inspectors also verified that the information obtained during the licensee's walkdowns was consistent with the items identified during the inspector's independent walkdown (TI 2515/177, Section 04.02.c.3). In addition, the inspectors verified that the licensee had isometric drawings that describe the high pressure safety injection system configurations and had acceptably confirmed the accuracy of the drawings (TI 2515/177, Section 04.02.a). The inspectors verified the following related to the isometric drawings:

- High point vents were identified

- High points that do not have vents were acceptably recognizable
- Other areas where gas can accumulate and potentially impact subject system operability, such as at orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and under closed valves, were acceptably described in the drawings or in referenced documentation
- Horizontal pipe centerline elevation deviations and pipe slopes in nominally horizontal lines that exceed specified criteria were identified
- All pipes and fittings were clearly shown

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

Documents reviewed are listed in the attachment to this report. This inspection effort counts towards the completion of TI 2515/177 which will be closed in a later inspection report.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

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

- April 5-6, 2011, Unit 2, containment (all elevations)
- May 19, 2011, Unit 3, fire areas IV and V, diesel generator building
- May 20, 2011, Unit 2, turbine building 100 feet level including non-essential switchgear room
- June 2, 2011, Unit 1, auxiliary building 40 feet through 70 feet 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 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 inspected 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.

- April 18, 2011, Unit 3, safety injection pump rooms
- April 25, 2011, Unit 1, main steam support structure flood barriers at elevation 81 feet

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

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the Unit 2, essential cooling water heat exchanger, train A, thermal performance testing performed on April 29, 2011. The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines"; the licensee properly utilized biofouling controls; the licensee's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and the heat exchanger was correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one heat sink inspection sample as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings 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 two nondestructive examination activities and reviewed six nondestructive examination activities that included four types of examinations. The licensee did not identify any relevant indications accepted for continued service during the nondestructive examinations.

The inspectors directly observed the following nondestructive examinations:

<u>SYSTEM</u>	<u>REPORT NUMBER</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
255 VALVE	11-0283	3450543-1,2	Radiographic

Reactor Vessel Head Vent	11-0238	3555346	Radiographic
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The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>REPORT NUMBER</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
High Pressure Safety Injection	11-UT-2034	40-13	Ultrasonic
High Pressure Safety Injection	11-UT-2077	106-46	Ultrasonic
Reactor Coolant System	11-UT-2005	3-103	Ultrasonic
Reactor Coolant System	11-UT-2006	4-103	Ultrasonic
Essential Cooling Water	MT 11-272	3526600-1	Magnetic Particle
Bottom Mounted Instrument Nozzles			Visual, VT-2

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 compared any indications with previous examinations and verified that licensee personnel evaluated the indications in accordance with the ASME Code and approved procedures. The inspectors also verified the qualifications of all nondestructive examination technicians performing the inspections were current.

The inspectors reviewed one weld on the reactor coolant system pressure boundary and one weld on the essential cooling water system.

The inspectors reviewed records for the following welding activities:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>WELD TYPE</u>
Essential Cooling Water Spool S-039	3526600-1	Manual
Reactor Vessel Head Vent	3555346	Manual

The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code, Section IX,

requirements. The inspectors also verified, through observation and record review, that essential variables for the welding process were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.01.

b. Findings

No findings were identified.

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

a. Inspection Scope

The licensee did not perform inspections of the vessel upper head penetrations. No inspections were performed because the vessel upper head and its assembly was replaced and inspected in a previous outage. Therefore, the inspectors determined this section of Inspection Procedure 71111.08 is not applicable.

These actions constitute completion of the requirements for Section 02.02.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

These actions constitute completion of the requirements for Section 02.03.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to include appropriate qualitative acceptance criteria for determining that important activities have been satisfactorily completed. Specifically, Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 11, did not include appropriate screening criteria to satisfactorily evaluate boric acid leaks and deposits that may cause degradation of risk significant system barriers.

Description. The inspectors reviewed Procedure 70TI-9ZC01, to determine if the procedure implemented guidance discussed in Westinghouse Owner's Group Document WCAP-15988-NP, Revision 1, "Generic Guidance for an Effective Boric Acid Inspection Program for Pressurized Water Reactors." The licensee used this guidance, along with other industry guidance, to develop and implement an effective boric acid inspection and evaluation program as committed to in the Palo Verde response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants."

Procedure 70TI-9ZC01, Paragraph 3.6.2, included the following screening criterion for requiring evaluations for boric acid leaks:

"An Engineering evaluation of degraded or potentially damaged components shall be completed per Appendix C or of similar context. An evaluation is required for all active leaks and where rust is present in the boric acid crystals."

The inspectors noted that this was the only criterion set in Procedure 70TI-9ZC01 that would require an evaluation be performed to assess the condition of boric acid leaks from risk significant piping systems. The inspectors noted that there was no detailed screening criteria set in the procedure. Particularly, there was no detailed guidance on leaks from pumps and valves. This was contrary to the guidance set forth in WCAP-15988-NP, Section 4.6, "Screening, Evaluation, and Disposition," which stated:

"It is preferable that the screening, evaluation, and disposition of the borated water leak and/or boric acid deposit be performed in a systematic way. This key element discusses the details of the criteria for screening, evaluating, and dispositioning the inspection findings. The overall evaluation and minimum attributes are noted below. Detailed evaluation guidelines for a plant specific program shall be developed by each utility."

Once the inspectors brought this to the attention of the licensee's staff, the licensee staff provided a copy of the training document used to train and guide the boric acid screeners to appropriately screen and evaluate the boric acid leaks. This training document included detailed screening criteria for pumps and valves. The licensee staff explained that the boric acid screeners are responsible for the decision of screening a leak to an evaluation and that, with the training, the screeners should make the correct decision. The licensee staff further explained the screeners would use the training document if

more guidance was necessary to make the determination. The inspectors noted that the training document was not referenced in the procedure. Additionally, the inspectors noted that the boric acid screens relied on the judgment of the boric acid screeners.

After reviewing the procedure, the inspectors completed a detailed review of 15 Palo Verde Action Requests (PVAR) which documented boric acid screens for leaks or accumulations, since August 2009, that were conditions adverse to quality. Of those 15 PVAR's, the inspectors identified that 5 of these PVAR's (which documented brown discoloration/rust or active leaks) incorrectly concluded that a boric acid evaluation for degradation was not necessary. The incorrect boric acid screens are detailed as follows:

- PVAR 3482323 – Body to bonnet leak with brown boron buildup on letdown pressure control valve 201P
- PVAR 3447318 – Leak in packing of high pressure safety injection valve 2JSIDHV0331 which picture shows rust and excessive leakage
- PVAR 3368100 – High pressure safety injection header vent valve leaking at greater than 5 drops/minute
- PVAR 3368133 – Low pressure safety injection header vent valve leaking at greater than 5 drops/minute
- PVAR 3368120 - High pressure safety injection header vent valve leaking at greater than 5 drops/minute

After identifying these incorrect boric acid screens, the inspectors interviewed two licensee personnel who were qualified as boric acid screeners. The inspectors asked what guidance is used to determine if a boric acid leak should be evaluated. The screeners answered that, if necessary, the screener would use the procedure for better guidance. The inspectors then asked if the screeners would use the training documentation. The screeners answered that they have not used the training documentation for guidance. From these questions and the incorrect screens, the inspectors confirmed that decisions to evaluate degradation caused by boric acid leaks relied upon the screeners' judgments and not detailed criteria documented in the boric acid program document. The licensee entered this issue into the corrective action program as PVAR 3691351.

In September 2010, the licensee completed a self-assessment to determine if Palo Verde implements an effective boric acid corrosion control program that meets the intent of WCAP-15988-NP. In Self-Assessment 3524435, the licensee identified multiple weaknesses with the boric acid program. In particular, the licensee identified that boric acid evaluations were not always completed in accordance with Procedure 70TI-9ZC01 and training. Of 20 boric acid screens that did not have evaluations, four were identified as needing further evaluation. Palo Verde Action Request 3524566 was written to address the assessment results. Palo Verde Action Request 3542157 was written to address recommendations to improve the boric acid program. At the time of the

inspection, the inspectors determined that none of the recommendations had been implemented to improve the boric acid control program. The inspectors determined that implementation of the self-assessment recommendations would likely have prevented the failure to include appropriate screening criteria.

Analysis. The inspectors determined the failure to include appropriate screening criteria into Procedure 70TI-9ZC01 was a performance deficiency. The performance deficiency is more than minor because it is associated with the procedure quality attribute of the Barrier Integrity Cornerstone and adversely affects the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Phase 1 of NRC Manual Chapter 0609, "Significance Determination Process," the finding screens as having very low safety significance (Green) because the finding does not represent a degradation of a radiological barrier, does not represent a degradation of the control room toxic barrier functions, does not represent an actual open pathway of reactor containment, and does not involve an actual degradation of hydrogen igniters in the reactor containment. The finding includes a cross-cutting aspect in the area of problem identification and resolution, associated with the corrective action program component, because the licensee failed to take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity. Specifically, the licensee identified similar deficiencies in the self assessment of the boric acid program in September 2010; however, failed to take appropriate corrective actions to fully correct the identified deficiencies [P.1(d)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that "Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." Contrary to the above, the licensee failed to include appropriate qualitative acceptance criteria in procedures for determining that important activities have been satisfactorily accomplished. Specifically, prior to April 2011, Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 11, did not include appropriate screening criteria to satisfactorily evaluate boric acid leaks and deposits that may cause degradation of risk significant system barriers. Because this violation is of very low safety significance and was placed in the corrective action program as PVAR 3691351, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000528;529;530/2011003-01, "Failure to Include Screening Criteria in the Boric Acid Corrosion Control Program."

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

a. Inspection Scope

The inspectors reviewed the licensee's steam generator tube inspection program to confirm that the licensee followed the examination scope, recommended schedule, and

expansion criteria that met the appropriate technical specification requirements, EPRI guidelines, and commitments made to the NRC. The steam generators were replaced during the fall of 2003, with enhanced System 80 Plus steam generator models containing Alloy 690 thermally treated tubes. Based on the steam generator conditions, the inspection scope for Refueling Outage U2R16 included:

(1) One hundred percent bobbin coil testing in both generators from tube end to tube end; (2) Plus Point testing of 50 percent of all tubes in the region from minus three inches to plus three inches from the top to the tube sheet in the hot legs; (3) special interest testing, using the Plus Point probe of non-resolved bobbin signals; (4) Plus Point probe inspection of dent signals; and (5) visual inspection of all tube plugs.

Eddy current inspection results from U2R12 indicated that there was wear caused by rubbing against the support structures, especially in the region associated with the first four tube rows in columns 75 through 129, which has been designated the central cavity wear region. As a result, the licensee has performed 100 percent bobbin inspections at all outages since replacement of the steam generators.

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 inspectors reviewed acquisition technique and analysis technique sheets, which are identified in the attachment.

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. Prior to this outage, there were 126 tubes plugged for steam generator 21 and 131 tubes plugged for steam generator 22.

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 as a minimum had established a test scope that met technical specification requirements, EPRI guidelines, and commitments made to the NRC.

The inspectors assessed the in-situ screening criteria to assure consistency between assumed nondestructive examination flaw sizing accuracy and data from the EPRI

examination technique specification sheets. No conditions were identified that warranted in-situ pressure testing.

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

These actions constitute completion of the requirements for Section 02.04.

b. Findings

No findings were identified.

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

a. Inspection scope

The inspectors reviewed 30 condition reports associated with inservice inspection (ISI) activities and found the corrective actions for ISI issues 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 ISI 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 ISI operating experience.

The inspectors reviewed Audit 2011-002. This audit, performed by the licensee's nuclear assurance division, reviewed the licensee special processes programs, such as welding, boric acid corrosion control, and the ISI and testing programs. The conclusion of the audit identified that the programs for special processes and inservice test programs have been implemented to meet regulatory requirements. However, the ISI program as implemented by ASME Code, Section XI was found to be "marginally effective" and "program controls were not established to prevent loss of margin to regulatory requirements." Additionally, the overall administration of the ISI program did not "produced consistent compliance with program requirements and some licensing commitments."

The audit identified 45 conditions adverse to quality. The inspectors reviewed these conditions to determine if the conditions were given appropriate treatment with respect to the licensee's corrective action program and safety significance. The inspectors determined that these conditions were entered into the corrective action program and the licensee has an appropriate plan for resolving these conditions.

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

These actions constitute completion of the requirements of Section 02.05.

b. Findings

Introduction. The inspectors identified a Green, noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to

accomplish activities affecting quality in accordance with procedures. Specifically, the licensee failed to complete an immediate operability determination in accordance with Procedure 01PR-0AP04, "Corrective Action Program," when the licensee discovered the system leakage test methodology for the diesel fuel oil transfer system did not conform to ASME Code, Section XI testing requirements.

Description. On March 11, 2011, the licensee's nuclear assurance department identified the current basis and testing methodology for determining the acceptability of the buried portion of the diesel fuel oil transfer system was incorrect. The methodology for the system leakage test did not fully conform to current licensing basis of the diesel fuel oil transfer system. The current licensing basis is the testing requirements in IWA-5244, "Buried Components" of ASME Code, Section XI. This nonconforming condition was identified in PVAR 3654452.

The inspectors reviewed PVAR 3654452 and noted that the immediate operability determination was coded "N/A", or not applicable. The licensee determined that an operability determination was not necessary because PVAR 3654452 described that the nonconforming system leakage test was an administrative deficiency that affected the test reports. The operations department, believing that this condition only affected the test reports, determined that an operability determination was not necessary.

However, after discussion with the licensee staff, the inspectors confirmed that the testing methodology for the system leakage tests did not conform to IWA-5244, in that testing did not evaluate pressure loss or difference in inlet to outlet flow. Since the testing methodology did not conform to the current licensing basis, an immediate operability determination should have been completed in accordance with Paragraph 3.2.1.5 of Procedure 01PR-0AP04. Paragraph 3.2.1.5 stated: "Operability shall be determined immediately upon discovery that a structure, system, and components (SSCs) subject to Technical Specification or that SSCs subject to TS is in a degraded or nonconforming condition."

Following discussions with the inspectors, the licensee wrote PVAR 3704003 on April 19, 2011 to clarify that the incorrect testing methodology for the diesel fuel oil transfer system was a nonconforming condition. In PVAR 3704003, the immediate operability determined that the diesel fuel oil transfer system was operable based on engineering judgment. Subsequently, a prompt operability determination was completed with the conclusion that the system was operable.

Analysis. The inspectors determined that the failure to complete an immediate operability determination in accordance with Paragraph 3.2.1.5 of Procedure 01PR-0AP04, "Corrective Action Program," was a performance deficiency. The performance deficiency is more than minor because the nonconforming condition created a reasonable doubt on the operability of the diesel fuel oil transfer system. Using Phase 1 of NRC Manual Chapter 0609, "Significance Determination Process," the finding screens as having very low safety significance (Green) because the finding is a design or qualification deficiency confirmed not to result in the loss of operability or functionality of the system. The finding includes a cross-cutting aspect in the area of Problem

Identification and Resolution, corrective action program component, because the licensee failed to identify issues completely, accurately, and in a timely manner commensurate with their safety significance. Specifically, the licensee failed to accurately document the nonconforming condition identified in PVAR 3654452 which led to a failure to complete an immediate operability determination as required [P.1(a)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states "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, from March 11 to April 19, 2011, the licensee failed to complete an immediate operability determination in accordance with Procedure 01PR-0AP04, "Corrective Action Program," when the licensee discovered the system leakage test methodology for the diesel fuel oil transfer system did not conform to ASME Code, Section XI testing requirements. Because this violation is of very low safety significance and was placed in the corrective action program as PVAR 3704003, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000528; 529; 530/2011003-02, "Failure to Complete an Immediate Operability Determination for Code System Leakage Test."

1R11 Licensed Operator Requalification Program (71111.11)

.1 Quarterly Review

a. Inspection Scope

On March 29, 2011, during training on station blackout scenarios, 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 sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- May 10, 2011, Unit 2, containment atmosphere radiation monitor
- June 24, 2011, Unit 2, essential chiller train A labyrinth seal

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 were identified.

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

a. Inspection Scope

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

- April 13, 2011, Unit 2, nuclear cooling system maintenance with one emergency cooling water heat exchanger out of service
- June 2, 2011, Unit 1, risk management actions when low pressure safety injection, train B, was removed from service
- June 7, 2011, Unit 3, train B emergency diesel generator, emergency cooling water, emergency chilled water, and safety injection systems outage for planned maintenance
- June 8, 2011, Unit 3, pressurizer vent valve to containment, RCA-HV-106, failure

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

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- April 7, 2011, Units 1, 2, and 3, emergency diesel generator push rod fatigue cracking due to inadequate heat treatment
- April 11, 2011, Unit 2, emergency diesel generator, train B, turbo lube oil filter three way valve leak
- April 21, 2011, Unit 2, source range monitor channel 2 indication issues
- May 17, 2011, Unit 1, elevated temperatures on pressurizer safety valve tail pipe
- May 17, 2011, Units 1, 2, and 3, steam generator blowdown isolation valve differential pressure calculation errors
- May 31, 2011, Unit 3, increased oil consumption of Unit 3 essential chiller train B

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six operability evaluations inspection samples as defined in Inspection Procedure 71111.15-05

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

Temporary Modifications

a. Inspection Scope

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

- May 31, 2011, Units 1, 2, and 3, temporary procedure change to Procedure 41OP-1HJ01, "Control Room Handswitch/Valve Checklist"

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

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

b. Findings

Failure to Submit a Licensee Event Report for a Condition Prohibited by the Plant's Technical Specifications

Introduction. The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.73(a)(1) for failure to submit a Licensee Event Report within 60 days following discovery of a condition prohibited by Technical Specifications.

Discussion. Technical Specification 3.3.9, "Control Room Essential Filtration Actuation Signal (CREFAS)" requires that one CREFAS channel shall be operable. The licensee initiated PVAR 3691352 on April 13, 2011, after identifying that a procedure change request implemented on April 8, 1986 for Procedure 41OP-1HJ01, "Control Room Handswitch/Valve Checklist," changed the required Control Room Essential Filtration System (CREFS) outside air damper position from normally open to normally closed.

Each train of the system contains two dampers in series, with each damper actuated from one of the two separate trains of the CREFAS. Units 1 and 3 operators declared CREFAS trains A and B inoperable and entered Technical Specification 3.3.9. Unit 2 was not in a condition of applicability for the technical specification at the time of discovery. On April 16, 2011, engineers concluded that the original design of the outside air dampers required the dampers to be open and with the dampers closed, both trains of CREFAS would be required to be operable. On June 15, 2011, the inspectors identified that the licensee had not reported the condition as required by 10 CFR 50.73. The inspectors concluded that the licensee failed to thoroughly evaluate the past operability of CREFAS to ensure that reportability requirements were met. The licensee entered the issue into the corrective action program as PVAR 3791486.

Analysis. The inspectors concluded the failure of Arizona Public Service to report a condition prohibited by technical specifications was a performance deficiency. The inspectors evaluated this performance deficiency using the traditional enforcement process because the failure to submit a required report affected the NRC's ability to perform its regulatory function. Consistent with the guidance in Section 2.2.2 and Section 6.9.d of the NRC Enforcement Policy, the inspectors concluded the finding was a Severity Level IV violation because the licensee failed to make a timely written report that resulted in no or relatively inappreciable potential safety consequences.

Enforcement. Title 10 CFR 50.73(a)(1) requires, in part, that the licensee submit a Licensee Event Report for any event of the type described in this paragraph within 60 days after the discovery of the event. Title 10 CFR 50.73(a)(2)(i)(B) required, in part, that the licensee report any operation or condition prohibited by the plant's technical specifications. Contrary to the above, the licensee failed to submit a required Licensee Event Report within 60 days after discovery on April 13, 2011 of a condition prohibited by the plant's technical specifications. This is a Severity Level IV noncited violation consistent with Section 2.2.2 and Section 6.9.d of the NRC Enforcement Policy. Because this finding is of very low safety significance and has been entered into the corrective action program as PVAR 3791486, this violation is being treated as an noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000528, 529, 530/2011003-03, "Failure to Submit an LER for a Condition Prohibited by the Plant's Technical Specifications."

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

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

- April 4, 2011, Unit 2, containment atmosphere radiation monitor, RU-1
- April 19, 2011, Unit 2, essential cooling water heat exchanger, train A, design validation testing following replacement

- June 2, 2011, Unit 1, risk low pressure safety injection, train B, after preventative maintenance
- June 3, 2011, Unit 2, voltage regulating transformer alternate ac source for vital distribution panel PND-N-14.
- June 9, 2011, Unit 3, pressurizer vent valve to containment, RCA-HV-106

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the Unit 2 refueling outage, conducted April 1 through May 11, 2011, 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

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

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- April 6, 2011, Unit 3, atmospheric dump valve, ADV-179

- April 8, 2011, station blackout generator quarterly test
- April 13, 2011, Unit 2, containment spray system nozzle test
- April 25, 2011, Units 1, 2, and 3, CREFS
- May 4, 2011, Unit 2, turbine-driven auxiliary feedwater pump, AFA-P01 full flow inservice test
- May 10, 2011, Unit 1, reactor coolant system unidentified leak rate surveillance
- May 18, 2011, Unit 2, containment penetration 51 as-left local leak rate test

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

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

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP1 Exercise Evaluation (71114.01)

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2011 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated two seismic shocks, reactor coolant system leaks inside containment, damage to safety injection pumps, physical core damage, and a radiological release to the environment through the cracked containment wall to demonstrate the licensee personnel's capability to implement their emergency plan.

The inspectors evaluated exercise performance by focusing on the risk-significant activities of event classification, offsite notification, recognition of offsite dose consequences, and development of protective action recommendations, in the simulator control room and the following licensee emergency response facilities:

- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

The inspectors also assessed recognition of, and response to, abnormal and emergency plant conditions, the transfer of decision making authority and emergency function responsibilities between facilities, onsite and offsite communications, protection of

emergency workers, emergency repair evaluation and capability, and the overall implementation of the emergency plan to protect public health and safety and the environment. The inspectors reviewed the current revision of the facility emergency plan, emergency plan implementing procedures associated with operation of the licensee's emergency response facilities, procedures for the performance of associated emergency functions, and other documents as listed in the attachment to this report.

The inspectors compared the observed exercise performance with the requirements in the facility emergency plan, 10 CFR 50.47(b), 10 CFR Part 50, Appendix E, guidance in licensee emergency plan implementing procedures, and other federal guidance.

The inspectors attended the post-exercise critiques in each emergency response facility to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management. The specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.01-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation for failure to critique weak or deficient performance in the Technical Support Center during a full-scale multi-facility exercise conducted March 1, 2011, as required by 10 CFR Part 50, Appendix E, IV(F)(2)(g).

Description. The inspectors performed an in-office review of the scenario for the March 1, 2011, biennial exercise and identified the radiological release path as a [simulated] through-wall crack in the containment structure, and confirmed the release path during an onsite briefing February 28, 2011. The inspectors observed Technical Support Center performance during the biennial exercise conducted March 1, 2011. During the exercise a report was made to the Simulator Control Room of visible steam in the area of the 100 foot elevation personnel airlock; this information was communicated by the Simulator Control Room to the Technical Support Center and Emergency Operations Facility. The inspectors observed that the Technical Support Center assumed the airlock was the source of the steam without validating their assumption. Technical Support Center engineers prepared several options to mitigate the reported steam release, based on an assumption of structural damage to the airlock frame or the airlock door seal.

The inspectors observed the immediate post-exercise critique among participants and evaluators in the Technical Support Center. The post-exercise critique did not identify the facility's lack of understanding of the radioactive release path as a performance issue, nor did it identify that the developed plume mitigation strategies would have been ineffective. The inspectors also observed the exercise evaluation team's March 3, 2011, briefing to management on the results of the biennial exercise. The exercise evaluation team identified three performance weaknesses and twelve evaluation objectives

evaluated at less than fully-satisfactory performance, including that: (1) the Technical Support Center did not act in a timely manner in executing plume mitigation strategies; and (2) the Emergency Operations Facility had difficulty in determining the correct size of hole in the containment structure airlock to use in dose assessment. However, evaluators did not identify that the Technical Support Center did not understand the release path or that they took actions based on their inaccurate understanding.

The inspectors reviewed PVAR 3633050 (*Objective 8-1, demonstrate the ability of the TSC to support emergency response activities was rated as unsat for the TSC. Issues include failure to effectively execute mitigation strategies*), and the Objectives and Demonstration Criteria for the Technical Support Center. The inspectors determined Objective 9-1 (*Recognize appropriate release paths and core status for source term*) and Objective 9-3 (*Determine and utilize appropriate methods of assessment for the conditions described by the scenario*) were evaluated as Satisfactory for the Technical Support Center. The inspectors concluded the licensee's evaluation did not identify the Technical Support Center's lack of understanding of the radioactive release path as a performance weakness or deficiency, based on observation of the management briefing, the licensee's evaluation of Objectives 9-1 and 9-3, and their review of PVAR 3633050.

The inspectors concluded the failure of the Technical Support Center to correctly identify the release path for radioactive steam was a weakness because the resulting ineffective mitigation strategies would have precluded effective implementation of the emergency plan had the event occurred. Therefore, failure of the licensee's evaluation team to identify the lack of knowledge about the release path in the Technical Support Center as a weakness is a performance deficiency.

Analysis. Failure to critique a weakness in emergency response organization performance is a performance deficiency within the licensee's ability to foresee and correct. This performance deficiency is more than minor because it affected the emergency preparedness cornerstone and was associated with the emergency response organization performance attribute. The finding had a credible impact on the emergency preparedness cornerstone objective because a lack of understanding of the release path for radioactive material affects the licensee's ability to implement adequate measures to protect the health and safety of the public. The finding was associated with a violation of NRC requirements. This finding was evaluated using the Emergency Preparedness Significance Determination Process and was determined to be of very low safety significance (Green) because it was a failure to comply with NRC requirements, was associated with emergency planning standard 50.47(b)(14), was not a risk significant planning standard issue as defined in Manual Chapter 0609, Appendix B, Section 2.0, and was not a functional failure of the planning standard. The finding was not a functional failure because the weak or deficient performance the licensee failed to critique was not associated with risk significant planning standard activities. This finding was assigned a cross-cutting aspect in the area of problem identification and resolution [P.1(a)] because the licensee failed to identify a performance issue completely and accurately.

Enforcement. Title 10 CFR Part 50, Appendix E, IV(F)(2)(g), states, "All training, including exercises, shall provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified shall be corrected." A weakness (deficiency) is defined by Manual Chapter 0609, Appendix B, Section 2.1(e), as performance during a drill or exercise that could have precluded effective implementation of the emergency plan had the simulated events occurred. Contrary to the above, the licensee failed to identify and correct a weakness during a full-scale exercise conducted March 1, 2011. Specifically, the licensee failed to identify the Technical Support Center had not correctly identified the release path for radioactive steam and therefore their planned release mitigation strategies would have been ineffective. Because this failure is of very low safety significance and has been entered into the licensee's corrective action system Condition Report / Disposition Requests (CRDR) 3693235, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000528, 529, 530/2011003-04 "Failure to Critique a Weakness during a Biennial Exercise".

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an on-site review of Palo Verde Nuclear Generating Station Emergency Plan, Revisions 44 and 45, effective January 31, 2011, and February 18, 2011, respectively. Revision 44 revised the abbreviations list, added a Radiation Protection Group Lead and Emergency Response Facility Communicator to the Operations Support Center, added a Information Systems Manager to the Emergency Operations Facility, removed Facility Advisor positions from the Technical Support Center and Emergency Operations Facility, removed a Shift Technical Advisor from the Emergency Operations Facility, updated figures with 2010 census data, and relocated radiation detection instruments to a centrally located area. Revision 45 made a correction to indicate that radiation detection Instruments are contained in TSC, OSC, and EOF kits; one OSC kit is located at each of the three Units.

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q). These reviews were not documented in a safety evaluation report and did not constitute an approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of two samples as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the fourth quarter 2010 emergency preparedness performance indicators and the first quarter 2011 reactor performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

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

b. Findings

No findings were identified.

.2 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator for Palo Verde Units 1, 2, and 3 for the period from the second quarter 2010 through the first quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC integrated inspection reports for the period from the second quarter 2010 through the first quarter 2011 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

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

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

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Emergency ac Power System (MS06)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index – emergency ac power system performance indicator for Palo Verde Units 1, 2 and 3 for the period from the second quarter 2010 through the first quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6, was used. The inspectors reviewed the licensee’s operator narrative logs, mitigating systems performance index derivation reports, issue reports, event reports and NRC integrated inspection reports for the period from the second quarter 2010 through the first quarter 2011 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 Nuclear Energy Institute guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index – high pressure injection systems performance indicator for Palo Verde Units 1, 2 and 3 for the period from the second quarter 2010 through the first quarter 2011. 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 6, 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 from the second quarter 2010 through the first quarter 2011 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.

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

b. Findings

No findings were identified.

.5 Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill/Exercise Performance performance indicator for the period from January 2010 through December 2010. 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," Revisions 5 and 6, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator; assessments of performance indicator opportunities during predesignated control room simulator training sessions, performance during the 2011 biennial exercise, and performance during other drills. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the drill/exercise performance sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors sampled licensee submittals for the Emergency Response Organization Drill Participation performance indicator for the period from January 2010 through December 2010. 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," Revisions 5 and 6, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors

reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator and revisions of the roster of personnel assigned to key emergency response organization positions. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the emergency response organization drill participation sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.7 Alert and Notification System (EP03)

a. Inspection Scope

The inspectors sampled licensee submittals for the Alert and Notification System performance indicator for the period from January 2010 through December 2010. 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," Revisions 5 and 6, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator and the results of periodic alert notification system operability tests. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the alert and notification system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

40A2 Identification and Resolution of Problems (71152)

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

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities

and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included: 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 were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of January through June 2011.

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 inspection sample as defined in Inspection Procedure 71152-05.

b. Findings and Observations

Adverse Trend in Maintenance Related Equipment Failures and Degraded Conditions

The inspectors concluded that an adverse trend associated with maintenance related equipment failures and degraded conditions existed at Palo Verde through June 2011. Since January 1, 2011, several plant transients occurred and degraded equipment issues were identified due to inadequate maintenance activities conducted by plant personnel. These issues resulted in events that upset plant stability and increased unavailability of equipment important to safety. Examples of this adverse trend included:

- January 14, 2011, Unit 3 main condenser tube failure resulted in an unplanned downpower. The investigation revealed that maintenance personnel performing tube sheet coatings during the previous refueling outage failed to ensure degraded tubes were replugged following the maintenance (FIN 05000530/2011002-05, "Inadequate Condenser Maintenance Activities")
- February 21, 2011, failure of startup transformer X02 resulted in a loss of power to a safety related electrical bus on Units 1 and 3, and an automatic start of the emergency diesel generators associated with those busses. The investigation revealed that cable splicing maintenance activities associated with the transformer, performed the week before, were inadequate and led to the cable failure (FIN 005000528;529;530/2011003-06)
- March 2011, monitoring procedures and preventive maintenance schedules were not developed and implemented to ensure essential chiller oil reservoir level remained in the range to support chiller operability. Engineering practices, operations procedures, and preventative maintenance schedules did not effectively manage chiller oil inventory and resulted in the chiller becoming inoperable on multiple occasions (NCV 05000529/2011002-03, "Failure to Establish Adequate Procedures to Control Essential Chiller Compressor Oil Level")

- May 2011, modifications performed on containment Personnel Air Lock doors during the most recent Unit 2 refueling outage were inadequate, resulting in multiple failures of the doors during surveillance testing. The degraded doors required significant rework after Unit 2 returned to full power and also required multiple entries into Technical Specification 3.6.2, "Containment Air Locks," during the rework activities CRDR 3763813
- June 6, 2011, operators identified a loose cylinder end cap on Unit 2 Charging Pump No. 3 during plant walkdowns. Subsequent investigation revealed that duct tape had been left in the pump during maintenance completed on June 3, 2011. The pump was removed from service for inspection and repairs and the licensee classified the event as a maintenance rule functional failure CRDR 3772927

On June 28, 2011, Arizona Public Service initiated CRDR 3795122 to document this adverse trend and requested an apparent cause evaluation be performed.

The inspectors will monitor the licensee's progress to address this adverse trend.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized corrective action items documenting issues that warranted further scrutiny.

- February 21, 2011 Failure of 13.8kV electrical splice associated with startup transformer X02
- November 2, 2010 Identification of ASME Boiler & Pressure Vessel (B&PV) Code, Section III, welds that did not meet acceptance standards post installation

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.

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

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

b. Findings

.1 Failure to Have Adequate Documentation for Verification of ASME Code Compliance

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion VII "Control of Purchased Material, Equipment, And Services" for the failure of licensee personnel to maintain radiographs onsite for the verification of ASME Code, Section III compliance. Specifically, radiographs for welds associated with the reactor head vent line were neither received nor reviewed as required. When the radiographs were obtained, reviews identified that welds for Units 1 and 2 did not meet the standards of Section III of the ASME B&PV Code.

Description. On October 1, 2010, inservice inspection (ISI) personnel noted during review of an unrelated project that radiographs for welds in the reactor vessel head vent line had not been reviewed by the group. Per Procedure 12DP-0MC46 "Receipt Inspection," ISI personnel were required to review radiographic film of items received for receipt inspection. These welds were part of a modification that replaced the reactor vessel heads for all three units at Palo Verde Nuclear Generating Station. These welds are classified as ASME Class 1 Safety Related components. ASME Code, Section III, NB-5000, requires that these welds be examined by radiography personnel and shall be free on any type of crack or zone of incomplete fusion or penetration. In addition, the Code requires that unacceptable weld defects shall be removed or reduced to an acceptable limit. Procedure 87DP-0MC09, "Item Procurement Specification Requirements," required that purchases of ASME Class 1 safety related components include all required radiography to be completed and sent to the owner. Inspectors determined that this requirement to receive the requisite radiographs was not added to the purchase order. The licensee took action to acquire the radiographs of the aforementioned welds however did not review the extent of this condition until prompted by the inspectors' questioning. Through the inspectors' questioning, the licensee also determined that weaknesses existed in Procedure 12DP-0MC46, "Receipt Inspection," which could lead to other occurrences of missed reviews of radiographs. Upon receipt and review of the radiography in question, ISI personnel determined that welds, 100520D40 SO-2 Weld 3 and 200520D40 SO-1 Weld 1 for Units 1 and 2 respectively, did not meet the requirements of ASME Section III, NB-5000, due to fusion defects in the welds. At the time of discovery, the components had already been installed in the plant and were in service. A prompt operability determination utilized evaluation criteria in ASME, Section XI, to determine that there was a reasonable assurance that the flaws would not degrade sufficiently to challenge the barrier over the remaining operating cycle. Inspectors validated flaw characterization and analysis and determined that the licensee's conclusions were acceptable. The licensee has taken corrective actions to restore the affected welds to ASME, Section III acceptability standards. Weld 1 of 200520D40 SO-1, associated with Unit 2, has been repaired and verified to be acceptable during the 2R16 outage. Weld 3 of 100520D40 SO-2, associated with Unit 1, will be addressed in the upcoming outage for that unit starting October 8, 2011.

Analysis. Inspectors determined that the failure to maintain radiographs onsite for review was a performance deficiency. The performance deficiency was more than minor because it adversely affected the RCS equipment and barrier performance attribute of

the Barrier Integrity Cornerstone's objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Screening and Characterization of Findings," the finding is of very low safety significance (Green) because the reactor coolant system barrier remained intact, was not associated with the fuel barrier, and did not constitute a spent fuel pool issue. This finding had a cross-cutting aspect in the area of human performance associated with the work practices component because the licensee failed to communicate expectations regarding procedural compliance and personnel follow procedures [H.4(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services" states, in part, that measures shall be established to assure that purchased material, equipment, and services conform to procurement documents. Documentary evidence that material and equipment conform to the procurement requirements shall be available at the nuclear power plant prior to installation or use of such material. Procedure 87DP-0MC09, "Item Procurement Specification Requirements," Revision 43, stated, in part, for the procurement of safety related ASME Section III items, the results of tests and examinations which are in addition to the materials specifications and required by the Code shall be stipulated. Procedure 12DP-0MC46 "Receipt Inspection" Revision 8, stated in part that radiographic film and associated documentation should be sent to the inservice testing group for review. Contrary to the above, procurement personnel did not stipulate that code required radiographs were to be included as part of the purchase order and did not send the radiographic film to the inservice testing group for review. Specifically, prior to October 10, 2010, the licensee failed to procure ASME Section III required radiographs associated with reactor head vent welds and review them per procedure. As a result, welds which did not conform to the requirements of ASME Section III were installed in the plant. The licensee corrected the nonconforming weld in Unit 2 during refueling outage 2R16 and will restore Unit 1 welds to compliance during the next refueling outage beginning October 8, 2011. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as CRDR 3540575, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the Enforcement Policy: NCV 0500528; 529; 530/2011003-05, "Failure to Have Adequate Documentation for Verification of ASME Code Compliance".

.2 Failure of 13.8kV Splice due to Inadequate Maintenance

Introduction. Inspectors reviewed a Green self-revealing finding for failure to properly repair a 13.8kV cable associated with the AENANX02 startup transformer. Specifically, the work performed failed to achieve an acceptable level of quality as required by Procedure 30DP-9MP01 "Conduct of Maintenance," and as a result the splice failed causing valid actuations of the emergency diesel generators due to a partial loss of offsite power to both Units 1 and 3.

Description. On February 7, 2011, Palo Verde Nuclear Generating Station completed a preventative maintenance task to perform electrical insulation resistance checks of 13.8kV cabling associated with the AENANX02 startup transformer. Startup transformer AENANX02 provides the normal offsite power supply for Unit 1 and Unit 3 and an

alternate supply to Unit 2. During this activity, the licensee discovered that cabling to electrical bus 2ENANS05B had a low resistance reading and documented this condition in PVAR 3588800. The licensee generated Work Order 3588803 for troubleshooting and reworked the affected cabling utilizing Specification 13-EN-306, "Installation Specification for Cable Splicing and Terminations for PVNGS". The licensee repaired the cables utilizing an engineering approved tape repair, in lieu of a like-for-like repair with a Raychem splice, when it was discovered there was not enough slack in the cables to do this effectively. Specification 13-EN-306 allowed this non-standard repair but the guidance contained within the specification was not detailed. The work instructions did not contain sufficient detail to ensure that the work task could be completed successfully. This was exemplified by craft personnel needing to stop work to ask engineering personnel for enhanced guidance. On February 14, 2011, the licensee completed repairs, obtained satisfactory resistance readings, and returned the transformer to service. On February 21, 2011, one of the repaired cables failed, causing valid actuations of the emergency diesel generators due to a partial loss of offsite power to both Units 1 and 3. Investigation of the failure under CRDR 3616634 identified that the taped 13.8kV electrical cable splice had failed. The repair had been inadequate, due to lack of necessary detail in the work instructions. The failed cable has since been replaced and corrective actions are planned to revise Specification 13-EN-306 to remove the use of taped splices for 13.8kV cable under Condition Report Action Item 3696512.

Analysis. The failure of the licensee to perform work with an acceptable level of quality for 13.8kV cable splicing was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it adversely affected the equipment reliability attribute of the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Screening and Characterization of Findings," the inspectors concluded that the finding is of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. This finding had a cross-cutting aspect in the area of human performance associated with the resources component because the licensee failed to provide complete, accurate and up-to-date procedures and work packages for splicing of 13.8kV electrical cable [H.2(c)].

Enforcement. This finding does not involve enforcement action because no violation of regulatory requirements was identified. Because this finding does not involve a violation and has very low safety significance, it is identified as FIN 05000528; 529; 530/2011003-06 "Failure of 13.8kV Splice due to Inadequate Maintenance".

.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 corrective action program; 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

No findings were identified.

4OA3 Event Follow-up (71153)

.1 Event Follow-up

a. Inspection Scope

The inspectors reviewed the below listed event for plant status and mitigating actions to: (1) collect information necessary to communicate event details to NRC management for determination of the appropriate agency response; (2) observe plant system parameters and status; (3) evaluate licensee actions; and (4) confirm that the licensee properly classified the event in accordance with emergency action level procedures and made timely notifications to NRC and state/governments, as required.

- June 23, 2011, Unit 3, event follow-up for fyrquel leak on main steam isolation valve actuator train A

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

These activities constitute completion of one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings were identified.

.2 Event Report Reviews

a. Inspection Scope

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

b. Findings and Observations

(Closed) Licensee Event Report 05000530/2010-001-00, Remote Shutdown Panel Pressurizer Auxiliary Spray Valve – Condition Prohibited by Technical Specification

On October 7, 2010, Unit 3, while performing Surveillance Test 40ST-9ZZ0, Remote Shutdown Disconnect Switch and Control Circuit Operability, the pressurizer auxiliary spray valve 3JCHBHV0203 failed to open from the remote shutdown panel while the local/remote disconnect switch was in local. Inspectors reviewed this issue and documented a Green licensee identified noncited violation in Section 40A7 of Inspection Report 05000528;529;530/2010005, for the failure of engineering personnel to provide adequate procedures for design validation testing following a design modification. The licensee entered the inadequate design validation testing into their corrective action program as PVAR 3548317 and CRDR 3550938. Inspectors reviewed the apparent cause evaluation and the licensee event report and determined that no additional violations of NRC requirements exist. This Licensee Event Report is closed.

(Closed) Licensee Event Report 05000528; 529; 530/2010-002-00 and Licensee Event Report 05000528, 529, 530/2010-002-01, Main Steam Isolation Bypass Valve Calculation Error Resulting in Operation Prohibited by Tech Spec

On May 7, 2010, during a Component Design Basis Review, the licensee identified that a calculation used for the closing force required for Main Steam Isolation Bypass Valves (MSIBVs) was non-conservative. The licensee concluded that the closing force would be inadequate to fully close the MSIBVs upon receipt of a Main Steam Isolation Signal when steam generator pressure is greater than 700 psi. As such, this condition rendered the MSIBVs inoperable when steam generator pressure is above 700 psi. At the time of discovery, Unit 1 was in a condition where MSIBVs were not required to be operable, but Units 2 and 3 were in Mode 1, and the MSIBVs were required to be operable. Operators complied with Technical Specification 3.6.3, "Containment Isolation Valves," and ensured the MSIBVs were closed, with their penetration flowpath isolated.

The licensee issued Licensee Event Report 2010-002-01 as a supplement following completion of its cause investigation. The licensee concluded that administrative barriers were unsuccessful in preventing the calculation error due to ineffective reviews and the lack of a questioning attitude. Additionally, the investigation revealed that management of the air-operated valve program did not consistently maintain adequate focus on engineering fundamentals in that the design basis limits were not clearly

established and insufficient technical rigor introduced non-conservatisms in the valve design calculations.

The inspectors reviewed the Licensee Event Reports and dispositioned the issue as a licensee-identified noncited violation in Section 4OA7 of this report. Both Licensee Event Reports are closed.

(Closed) Licensee Event Report 05000530/2011-001-00, Unit 3 Reactor Trip Due to Failed Open Main Feedwater Pump A Minimum Flow Recirculation Valve

On January 19, 2011, main feedwater pump A minimum flow recirculation valve failed open causing a percentage of feedwater flow to be diverted to the main condenser. Subsequently, Unit 3 experienced a reactor power cutback when main feedwater pump B tripped on low suction pressure. As a result, both steam generator water levels lowered, causing an automatic reactor trip. The licensee's investigation revealed the valve failure was caused by a failed diaphragm in a pneumatic 3-way precision relay within the valve control loop. The licensee replaced the relay and returned Unit 3 to full power on January 23, 2011. The licensee replaced the minimum flow recirculation flow valves on Units 1 and 2, as part of a modification to improve maintenance reliability, and the modification for Unit 3 is scheduled for the next refueling outage.

The inspectors reviewed the Licensee Event Report and did not identify any concerns. This Licensee Event Report is closed.

(Closed) Licensee Event Report 05000529/2011-001-00, Irradiated Fuel Movement with Misaligned Control Room Essential Filtration System

At 1803, on April 8, 2011, during reactor core offload for the Unit 2 refueling outage 2R16, Unit 2 entered Action Condition C of Technical Specification Limiting Condition for Operation (TS LCO) 3.3.9 when the Control Room Essential Filtration Actuation Signal (CREFAS) was declared inoperable due to both Control Room intake radiation monitors being out of service. Operators continued irradiated fuel movement due to an incorrect understanding that the already in-service Control Room Essential Filtration System (CREFS) train B air handling unit fulfilled the required actions of technical specification 3.3.9, Condition C. At 2140, plant personnel identified that the Control Room was not pressurized as expected, and questioned the proper alignment of CREFS. Operators identified that CREFS was not properly aligned, as required by the Technical Specifications and subsequently realigned the system at 2146. The licensee concluded that the root cause of the event was imprecise terminology in LCO 3.3.9 Required Action C.1, which did not specify that CREFS shall be placed in the essential filtration mode required for post-accident emergency alignment and initiated action to submit a License Amendment Request to clarify the requirement.

The inspectors reviewed the Licensee Event Report and dispositioned the issue as a licensee-identified noncited violation in Section 4OA7 of this report. This Licensee Event Report is closed.

(Closed) Licensee Event Report 05000528; 529; 530/2007-005-01; Inadequate Surveillance Test Procedure Resulting in Failure to Meet Surveillance Requirement

On August 21, 2007, during a review performed by the licensee, station personnel determined that a surveillance test procedure was not adequately testing several safety related valves. The surveillance test is used to verify that certain emergency safety feature valves can stroke within their respective response time limits. All the affected valves were assessed and the licensee determined that after the additional response time was accounted for, the total response time did not exceed any of the technical specification limits for any of the valves. The licensee submitted Licensee Event Report 05000528, 529, 530/2007-005-00 to report operation in a condition prohibited by Technical Specifications. The Inspectors reviewed this Licensee Event Report and determined that the failure to comply with technical specification surveillance requirements constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's enforcement policy. The inspector's review of this Licensee Event Report can be found in Inspection Report 2008-005. The licensee submitted Licensee Event Report 05000528, 529, 530/2007-005-01 in July 2010, as a supplement to document the findings of the root cause analysis. The root cause analysis identified that the surveillance test procedure was inadequate to test associated buffer relay response times as part of the overall component actuation response time testing. Corrective actions included calculating the additional response time for each of the valves and factoring that information into the acceptance criteria for testing of the valves and changing the testing procedure to reflect the appropriate response time limits.

The inspectors reviewed the supplement and the root cause analysis and did not identify any concerns. This Licensee Event Report is closed.

(Closed) Licensee Event Report 05000530/2008-001-01, Manual Reactor Trip when Removing a Degraded CEDM MG Set from Service

On September 16, 2008, control element drive mechanism A motor generator showed indications of being motorized (excessive amps for parallel condition with higher amps on B motor generator). During normal operation, both control element drive mechanism motor generator sets are operated in parallel in order to support control element assembly movement in group mode, however, the operators observed that both motor generator set output voltages were higher than normal. The licensee's troubleshooting efforts eventually required the operators to remove motor generator B from service while the motor generator A remained in service. After removing the motor generator B from service, an under-voltage condition occurred on the control element drive mechanism system resulting in a main turbine trip and a reactor cutback. Consistent with contingency actions discussed during the troubleshooting plan, operators initiated a manual reactor trip. The licensee submitted License Event Report 05000530/2008-001-00 to document the manual operation of the reactor protection system. The inspector's review of this Licensee Event Report can be found in Inspection Report 2008-005. The licensee submitted Licensee Event Report 05000530/2008001-01 in July 2010, as a supplement to document the findings of the root cause analysis. The root cause analysis

identified that the motor generator set design does not allow operators to override a failed automatic voltage regulator circuit.

The inspectors reviewed the supplement and the root cause analysis and did not identify any concerns. This Licensee Event Report is closed.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction (TI) 2515/183, "Followup to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

a. Inspection Scope

The inspectors assessed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included: (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as required by 10 CFR 50.54(hh); (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63 and station design bases; (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site.

b. Findings

No findings were identified.

.2 (Closed) NRC Temporary Instruction (TI) 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"

On May 26, 2011, the inspectors completed a review of the licensee's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the SAMGs were available and updated; (2) whether the licensee had procedures and processes in place to control and update its SAMGs; (3) the nature and extent of the licensee's training of personnel on the use of SAMGs; and (4) licensee personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for Palo Verde Nuclear Generating Station were provided as Enclosure 9 to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated May 26, 2011 (ML111470264).

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

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

4OA6 Meetings

Exit Meeting Summary

On March 4, 2011, the inspectors presented the results of onsite inspection of the licensee's biennial emergency preparedness exercise to Mr. D. Mims, Vice President, Nuclear Regulatory Assurance, and other members of the licensee staff. On April 21, 2011, the inspectors conducted a telephonic exit meeting with Mr. W. Hettel, Plant Manager, and other members of the licensee staff, to characterize an exercise performance issue. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On April 29, 2011, the inspectors presented the inspection results of the review of ISI activities to Mr. D Mims, Vice President, Nuclear Regulatory Assurance, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On July 1, 2011, the inspectors presented the inspection results to Mr. B. Bement, Senior Vice President, Site Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy for being dispositioned as noncited violations.

- Title 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, prior to February 16, 2011, Specification A0-AN-0449 "Specification for Coating Activities at Palo Verde Nuclear Generating Station," Revision 5, did not have sufficient guidance for the tracking of unqualified coatings in containment to ensure that unqualified coatings in

containment would not adversely impact the containment sump design basis loading. This finding was identified by the licensee in a nuclear assurance department audit 2011-002 and has been entered in the licensee's corrective action program as CRDR 3615692. The finding is of very low safety significance because it was not a design or qualification deficiency and did not result in the loss of operability or functionality of the containment sump.

- Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," states, in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents." Contrary to the above, prior to March 10, 2011, the system pressure test methodology for the buried portions of diesel fuel oil transfer system did not meet the testing requirements of ASME Code Section XI, IWA-5244, "Buried Components," Paragraph (b)(1). This finding was identified by the licensee in Audit Report 2011-002. The finding is of very low safety significance, because it is a design or qualification deficiency confirmed not to result in the loss of operability or functionality of the system. This issue is documented in the corrective action program as PVAR 3654452.
- Title 10 CFR Part 50, Appendix B, Criteria III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, on May 7, 2010, engineering personnel determined that a calculation used for the closing force required for main steam isolation bypass valves (MSIBV) was non-conservative, and rendered the MSIBVs inoperable when steam generator pressure is above 700 psi. The licensee took immediate corrective action to comply with the requirements of Technical Specification 3.6.3, "Containment Isolation Valves." The licensee entered the issue into the corrective action program as CRDR 3477841. The finding is of very low safety significance because the MSIBVs are normally closed during plant operation and the finding was a design deficiency confirmed not to result in the loss of operability or functionality.
- Technical Specification 3.3.9, "Control Room Essential Filtration Actuation Signal (CREFAS)," requires one CREFAS channel to be operable in Mode 6 or during movement of irradiated fuel assemblies. If both channels are inoperable, Condition C of Technical Specification 3.3.9 requires operators to immediately place one CREFS train in operation or immediately suspend movement of irradiated fuel. Contrary to this requirement, on April 8, 2011, after CREFAS train B failed while train A was out of service during the Unit 2 refueling outage, plant personnel identified that Unit 2 operators failed to immediately suspend movement of irradiated fuel and failed to ensure that one CREFS train was realigned to the essential filtration mode required for post-accident emergency alignment. Operators took immediate action to properly align the CREFS. The licensee entered the issue into the corrective action program as CRDR 36889366. The finding is of very low safety

significance because it only represented a degradation of the radiological barrier function of the control room.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

J. Allan, Systems Engineer
P. Anderson, Engineer, Engineering Programs
R. Barnes, Director Regulatory Affairs
J. Bayless, Senior Engineer, Engineering Programs
R. Bement, Senior Vice President, Site Operations
K. Chavet, Compliance
J. Compas, Vice President, Westinghouse
E. Dutton, Director, Nuclear Assurance Department
D. Elkington, Compliance
E. Fernandez, Senior Engineer, Engineering Programs
F. Gaber, Systems Engineer
R.C. Folley, Welding, Engineering Programs
B. Haley, Lead, Inservice Inspection
D. B. Hansen, Senior Consulting Engineer
J. Hesser, Vice President, Engineering
W. G. Hettel, Plant Manager, Plant Operations
K. House, Director, Engineering
F. Kuslush, Systems Engineer
M. Lacal, Vice President, Operations Support
W. Leaverton, SG Program Engineer, System Engineering
M. McClain, Systems Engineer
M. McGhee, Department Leader, Regulatory Affairs
P. McSparran, Dept. Leader Operations Training
D. Mims, Vice President, Nuclear Regulatory Assurance
T. Mock, Director, Operations
F. Oreshack, Compliance Consultant, Regulatory Affairs
M. Radspinner, Supervisor, Engineering
M. Ray, Director, Emergency Preparedness/Security
H. Ridenhour, Director, Maintenance
J. Ruoff, Engineer, Engineering Programs
S. Sawtschenko, Department Leader, Emergency Preparedness
E. Shouse, Site Representative, El Paso Electric
B. Theile, Department Leader, Program Engineering
J. Waid, Director Operations Training
M. Webb, Compliance Section Leader, Regulatory Affairs
T. Weber, Department Leader, Nuclear Regulatory Assurance

NRC Personnel

M. A. Brown, Senior Resident Inspector
J. Bashore, Resident Inspector
M. Baquera, Resident Inspector

D. Allen, Senior Project Engineer
D. Alley, Nuclear Reactor Regulation
J. Collins, Nuclear Reactor Regulation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000528;529;530/20 11003-01	NCV	Failure to Include Screening Criteria in the Boric Acid Corrosion Control Program (Section 1R08)
05000528;529;530/20 11003-02	NCV	Failure to Complete an Immediate Operability Determination for Code System Leakage Test (Section 1R08)
05000528;529;530/20 11003-03	NCV	Failure to Submit an LER for a Condition Prohibited by the Plant's Technical Specifications (Section 1R18)
05000528;529;530/20 11003-04	NCV	Failure to Critique a Weakness during a Biennial Exercise (Section 1EP1)
05000528;529;530/20 11003-05	NCV	Failure to Have Adequate Documentation for Verification of ASME Code Compliance (Section 4OA2)
05000528;529;530/20 11003-06	FIN	Failure of 13.8kV Splice due to Inadequate Maintenance (Section 4OA2)

Closed

05000530/2010001-00	LER	Remote Shutdown Panel Pressurizer Auxillary Spray Valve- Condition Prohibited by Technical Specifications
05000528;529;530/201 0002-00 and	LER	Main Steam Isolation Bypass Valve Calculation Error Resulting in Operation Prohibited by Tech Spec
05000528;529;530/201 0002-01	LER	Main Steam Isolation Bypass Valve Calculation Error Resulting in Operation Prohibited by Tech Spec
05000530/2011001-00	LER	Unit 3 Reactor Trip Due to Failed Open Main Feedwater Pump A Minimum Flow Recirculation Valve
05000529/2011001-00	LER	Irradiated Fuel Movement with Misaligned Control Room Essential Filtration System
05000528;529;530/200 7005-01	LER	Inadequate Surveillance Test Procedure Resulting in Failure to Meet Surveillance Requirement
05000530/2008001-01	LER	Manual Reactor Trip when Removing a Degraded CEDM MG Set from Service

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	17
40OP-9NA03	13.8 kV Electrical System (NA)	33
40OP-9PB01	4.16 kV Class 1E Power (PB)	24
40ST-9PB01	Class 1E Power Supply Transfer	3
40OP-9NB01	4.16 Non-Class 1E Power (NB)	24
40OP-9ZZ19	Hot Weather Protection	5
40DP-9OP34	Switchyard Administrative Control	19
AC-1103	Administrative Control and Compliance of NERC Standards at PVNGS	0
40OP-9SP01	Essential Spray Pond (SP) Train A	49
40OP-9ZZ17	Cold Weather Protection	36

PALO VERDE ACTION REQUESTS

3444068 3770227

CONDITION REPORTS / DISPOSITION REQUESTS

3444792 3280990 3405814 3487750 3616634

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
02-M-SPP-001	P & I Diagram Essential Spray Pond System	52
02-M-SPP-002	P & I Diagram Essential Spray Pond System	14

WORK ORDER

3602434	3337645	3513822	3453563	3549949	3554099	3570181
3479065	3453576	3453578	3130800	3330173		

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
Standard NUC-001-2	Nuclear Plant Interface Coordination	April 10, 2010

Section 1R04: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40ST-9AF07	Auxiliary Feedwater Pump AFA-P01 Monthly Valve Alignment	5
40OP-9AF01	Essential Auxiliary Feedwater System	52
40ST-9SI13	LPSI and CS System Alignment	23
40ST-9SI07	High Pressure Injection System Alignment Verification	15
40OP-9SI02	Recovery from Shutdown Cooling to Normal Operating Lineup	91
40ST-9ZZ20	Remote Shutdown Disconnect Switch and Control Circuit Operability	19
40ST-9AF07	Auxiliary Feedwater Pump AFA-P01 Monthly Valve Alignment	5

Section 1R04: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40ST-9AF08	Auxiliary Feedwater Pump AFB-P01 Monthly Valve Alignment	5

PALO VERDE ACTION REQUESTS

3676924 3593752 3677487 3728594 3586736 3689918 3556953
3571663

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-AFP-001	P & I Diagram Auxiliary-Feedwater System	37
01-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	48
01-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	37
02-P-SIF-203	Auxiliary Building Safety Injection System HPSI Pump Discharge	4
13-P-SIF-203	Auxiliary Building Safety Injection System HPSI Pump Discharge	24
13-P-SIF-201	Auxiliary Building Safety Injection System ESF Pump Suction	24
02-M-PCP-001	P & I Diagram Fuel Pool Cooling & Cleanup System	25
02-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	42

TECHNICAL SPECIFICATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
TS 3.7.5	Plant Systems: Auxiliary Feedwater (AFW) System	0

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Updated Final Safety Analysis Report	
CN-SEE-III-08-36	Evaluation of Suction Side Criteria for Palo Verde Units 1, 2 and 3 to Address GL-2008-01	1
13-MS-A108	Palo Verde Nuclear Generating Station Engineering Study, Determination of Allowable Void Size and Venting Criteria for the PVNGS ECCS and CSS Pump Suctions	2
13-MS-B086	PVNGS Engineering Study, Development of ECCS Suction Side Piping Arc Lengths Associated with Calculated Max Void Volumes	0
SI STM Volume 40	System Training Manual- Safety Injection System (SI)	4

Section 1R05: Fire Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
14AC-0FP05	Pre- Fire Strategies Manual	22
14AC-0FP05	Pre-Fire Strategies Manual Control	22
14AC-0FP05	Pre- Fire Strategies Manual	21

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
02-M-FPP-006	P & I Diagram Fire Protection System	14

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Updated Final Safety Analysis Report, Section 9B	15

Section 1R06: Flood Protection Measures**PROCEDURES**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73TI-9ZZ86	Visual Assessment of Hydrostatic/Flood, HELB, EDP, and RAD Barriers and Penetrations	4
40EP-9EO03	Loss of Coolant Accident	30
40EP-9EO04	Steam Generator Tube Rupture	25
40EP-9EO05	Excess Steam Demand	25
40EP-9EO06	Loss of All Feedwater	15
40EP-9EO08	Blackout	17
40EP-9EO09	Functional Recovery	45
40EP-9EO11	Lower Mode Functional Recovery	26

PALO VERDE ACTION REQUESTS

3703917	3525180	3198027	3160169	3525815	3160160	3126014
3372076	3222058	3525816				

CONDITION REPORTS / DISPOSITION REQUESTS

3470639

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-RDP-002	P & I Diagram Radioactive Waste Drain System	14
01-A-ZYD-485	Main Steam Support Structure Floor Inserts & Penetrations	5
01-A-ZYD-486	Main Steam Support Structure Wall Inserts & Penetrations	13
01-A-ZYD-509	Condensate Tunnel Penetrations Wall Elevations	3

WORK ORDER

0864572 3148053 3267822 3324667 3267823 3267821

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-MC-ZA-0808	, Engineering Calculation, MSSS Flooding at Elevation 81' Component Data Sheet, 1JRDNLSSH0133/134, Aux Feedpump AFA-P01 High High Room Level Switch Component Data Sheet, 1JHABLSH0126A/126B, Aux Feedpump AFA-P01 High Room Level Switch	6
CRDR 3470639	RD Sump High Level Float Switch Testing Failures Apparent Cause Evaluation (ACE) CRDR Evaluation Report Work Order 3198795 Work Order 3241213 Work Order 3258460 Work Order 3467108	0
13-MC-ZA-0809	As Built Auxiliary Building Flooding Calculation	6

Section 1R07: Heat Sink PerformancePROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70TI-9EW01	Thermal Performance Testing of Essential Cooling Water Heat Exchangers	9
73DP-9ZZ11	Heat Exchanger Program	9
73PE-1EW01	Heat Balancing of Essential Cooling Water System	2

WORK ORDER

3497433 3526600

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Struthers Wells Heat Exchanger Specification Sheet	January 14, 1976
	Design Inputs Requirements Checklist, Replacement of the Unit 2 Train A Essential Cooling Water Heat Exchanger (2MEWAE01**HTEXCH)	0
	ASME OM-2009, Part 21 Inservice Performance Testing of Heat Exchangers in Light Water Reactor Power Plants	
	Palo Verde Nuclear Generating Station Units 1, 2, and 3 Response to Generic Letter 89-13 "Service Water System Problems Affecting Safety Related Equipment"	January 26, 1990
	Revised Response to Generic Letter 89-13	October 1, 1993
	Test Results Report for Unit 1 Essential Cooling Water Heat Exchanger Train B	March 10, 1986
	EPRI Service Water Heat Exchanger Testing Guidelines Technical Report TR-107397	March 1998
EPRI NP-7552	Heat Exchanger Performance Monitoring Guidelines	December 1991

Section 1R08: Inservice Inspection Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73TI-0ZZ13	Radiographic Examination	13
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	7
70TI-9ZC01	Boric Acid Walkdown Leak Detection	10
73DP-9ZC01	Boric Acid Corrosion Control Program	3

Section 1R08: Inservice Inspection Activities**PROCEDURES**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73WP-0ZZ05	Welding of Ferritic and Martensitic Steels	11
40DP-9OP26	Operations PVAR Processing and Operability Dtermination/Functional Assessment	30
01PR-0AP04	Corrective Action Program	6

PALO VERDE ACTION REQUESTS

3110627	3319361	3446076	3447318	3523563	3579141	3111613
3350085	3368133	3477814	3550212	3704003	3660873	3674661
3653972	3660256	3694993	3660499	3654572	3672284	3653552
3706432	3691351	3688531	3290546	3368100	3368120	3482323
3556678	3654452					

CONDITION REPORTS / DISPOSITION REQUESTS

3430821	3585420	3397507	3555212	3660716	3674042	3399263
3472165	3660733	3673767	3484904	3472166		

CONDITION REPORTS ACTION ITEM

3557857	3558292	3484376	3663245	3558289	3564314	3525393
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WORK ORDER

3540648	3526600	3673722
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MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
ER 10-0015	Evaluate critical aspects per procedure 81DP-0RC01, PVNGS Steam Generator Management Program, of the Steam Generator Eddy Current Activities and Tube Repair Process for U3R15.	February 22, 2011
ER 10-0006	Evaluate Critical Aspects Per Procedure 81DP-0RC01, PVNGS Steam Generator Management Program, of the Steam Generator Eddy Current Activities and Tube Repair Process for U1R15.	June 23, 2010
MRS-DFD-2443-123-TC	Steam Generator Primary Services EPRI AAPDD Qualification Certificate for ANSER ADS on UNIX	0
MRS-DFD-2443-123-TC	Steam Generator Primary Services EPRI AAPDD Qualification Certificates for ANSER ADS and RTAA on UNIX	1
EPRI 1013706:	Steam Generator Management Program: Pressurized Water Reactor Steam Generator Examination Guidelines	7
	Replacement Steam Generators Analysts Guidelines Training Manual	12
SG-SG P-11-7	Palo Verde Nuclear Generating Station U2R16 Steam Generator Degradation Assessment	April 2011
SWMS No. 3139187	Palo Verde Nuclear Generating Station Steam Generator Management Program Self Assessment Reportasd	March 2009
ACTS R2-OMNI	Acquisition Technique Sheet for RC Examinations of Steam Generator Tubing (Flexible or Solid Body Probes)adsf	8
ACTS R2-RSG	Analysis Technique Sheet for RC Examinations of Steam Generator Tubing (Flexible or Solid Body Probes)	11
ACTS R5-OMNI	Acquisition Technique Sheet for RC Examinations Of Steam Generator Tubing (U Bend MF & HF +PT) {MF furthest from MU}	7
ACTS R5-RSG	Analysis Technique Sheet for RC Examinations Of Steam Generator Tubing (U Bend MF & HF + PT)	12
ACTS BI-OMNI	Acquisition Technique Sheet for Bobbin Coil Examinations	7
ACTS B1-RSG	Analysis Technique Sheet for Bobbin Coil Manual Analysis	14

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
ACTS B2-RSG	Analysis Technique Sheet for Bobbin Coil ADS Analysis	14
ACTS B3-RSG	Analysis Technique Sheet for Bobbin Coil ADS Sludge / Dent Analysis	9
ACTS B4-RSG	Analysis Technique Sheet for Bobbin Coil Manual PLP Analysis	3
ACTS R5-RSG	Analysis Technique Sheet for Bobbin Coil RTAA Analysis	3
102-06307-TNW/RKR	Palo Verde Nuclear Generating Station PVNGS, Unit 3, Docket No. STN 50-530, Third 10-Year Interval, First Period, Second Outage: Owner's Activity Report Number U3R15	January 19, 2011
Audit 2011-002	Special Processes, Inservice Inspection & Testing	April 12, 2011
3524435	Simple Self-Assessment Report Template: Boric Acid Corrosion Control Program	September 10, 2010
ESP42-00-001	Boric Acid Corrosion Control Job Qualification Card	July 23, 2008
ESP42-00-002	Boric Acid Leakage Evaluator Job Qualification Card	March 30, 2009

Section 1R11: Licensed Operator Requalification Program

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
15DP-OTR69	Training and Qualification Administration	34
15DP-OTR07	Training Oversight	12
40DP-9ZZ04	Time Critical Operator Actions Program	4
15TD-OOT05	NRC Exam Security	8
15DP-OOT08	Systematic Approach to Training	0
01DP-OEM13	Licensed Nuclear Operator Medical Examinations	15
LOCT-TPD	Licensed Operator Continuing Training Program	56
PV-E0115	Remediation Process	10
40OP-9EP08	Blackout	17

Section 1R12: Maintenance Effectiveness**PROCEDURES**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
33MT-9EC01	Essential Chiller	10
13-VTD-C150-0017	Carrier Parts List Catalog	3
70DP-0MR01	Maintenance Rule	31

PALO VERDE ACTION REQUESTS

3577381	3588556	3677610	3680735	3688232	3688696	3690394
3690420	3690494	3690613	3763273	3791027	3789448	3674955
3674352						

CONDITION REPORTS / DISPOSITION REQUESTS

3578587	3589252	3680435	3689027	3767538
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CONDITION REPORTS ACTION ITEM

3588512	3606893	3635027	3578588	3578589	3743539	3743546
3743553	3729422	3729481	3770415	3743553		

WORK ORDER

3577382	2775316	3590553	3770632	3773334	3690097	3464182
3577755	3577897	3589280	3689353	3688505	3701254	

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Essential Chillers – Oil Additions or Removal Log	June 15, 2011
	Adverse CRDR 3578587 Evaluation	0

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Notes of Discussion between PVNGS and Carrier	February 17, 2011
13- VTD-C150-0001	Carrier Descriptive Bulletin for Hermetic Centrifugal Liquid Chillers	0
13-VTD-C150-0007	Carrier Troubleshooting Guide	2
13-VTD-C150-0002	Carrier Instruction Manual for Centrifugal Refrigeration Machine	3
	Adverse CRDR 3618044 Evaluation	0
	System History Report, Radiation Monitoring System (SQ)	May 10, 2011
	PVNGS Maintenance Rule System Basis, Radiation Monitoring System	4
	(a)(1) Monitoring Report	May 10, 2011
	Apparent Cause Evaluation Report, Unit 2 Control Room Received All Three Detector Failure Alarms for Containment Atmosphere Radiation Monitor 2JSQBRU0001	0

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40ST-9SI03	LPSI and CS System Alignment Verification	23
70DP-0RA05	Assessment and Management of Risk when Performing Maintenance in modes 1 and 2	17
70DP-0RA04	Component Risk Significance Determination	2
70DP-0RA01	Shutdown Risk Assessments	37

PALO VERDE ACTION REQUESTS

3774830 3695700 3691333 3693659 3690273

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	48
01-M-SIP-002	P & I Diagram Safety Injection & Shutdown Cooling System	37

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-MC-SI-240	LPSI System Performance Evaluation and Surveillance Requirement Basis Calculation	0

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Technical Specification 3.5.4	
	Safety Evaluation for Technical Specification Amendment 124	

Section 1R15: Operability Evaluations

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
40DP-9OP26	Operations PVAR Processing and Operability Determination / Functional Assessment	30
40DP-9OP26	PVAR Processing and Operability Determination/Functional Assessment	29
40DP-9OP15	Operator Challenges and Discrepancy Tracking	26

PALO VERDE ACTION REQUESTS

3688914 3514173 3125979 3126287 3491088 3491722 3477841
3683692 3743852 3719631 3719613 3707037 3699996 3577381
3578587 3763273

CONDITION REPORTS / DISPOSITION REQUESTS

3690043 3260920 3687481

CONDITION REPORTS ACTION ITEM

3127427 3706455 3270625

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
01-M-DGP-001	Sheet 3, P & I Diagram Lube Oil Diesel Generator System	52

WORK ORDER

3245782	3688995	3579308	3599759	3579308	3730513	3141586
3486047	3141534	3141549	3472605	3141577		

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Engineering Evaluation of EDG Fluid Leakage and Potential Operability Concerns	2
13-MC-SG-0212	Maximum Differential Pressure for Main Steam AOVs	1
13-MC-ZZ-0219	Piston Style AOV Thrust and Actuator Sizing Calculation	1
13-MC-SC-0304	Steam Generator Blowdown Mass Flow	5
	Engineering Evaluation 3707172	April 21, 2011

Section 1R18: Plant ModificationsPALO VERDE ACTION REQUESTS

3703679 3703678 3691352 3696240 3714812 3705631 3715557
3711632

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	10CFR50.59 Review and Evaluation, TPCN #03 41OP-1HJ01	April 3, 1986
	Engineering Evaluation 3697313	April 16, 2011

Section 1R19: Postmaintenance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73DP-9ZZ11	Heat Exchanger Program	9
74ST-9SQ11	Train "B" Radiation Monitoring Quarterly Functional Test Procedure	10
AC-0254	Fastener Tightening / Preload	0
40ST-9SI03	LPSI and CS System Alignment Verification	23
73ST-9SI11	Low Pressure Safety Injection Pumps Minflow- Inservice Test	27
31MT-9SI01	Low Pressure Safety Injection Pump Maintenance	18
73ST-9XI24	Reactor and Pressurizer Vent Valves – Inservice Test	12A
30DP-9MP03	System Cleanliness and Foreign Material Exclusion Controls	17
40OP-9SP01	Essential Spray Pond (SP) Train A	48

PALO VERDE ACTION REQUESTS

3760756	117257	3682632
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WORK ORDER

3497433	3526600	3760770	3489729	3526600	3564789	3688901
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DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
02-E-PNF-0003	Control Wiring Diagram 120V AC Class 1E Power System Ungrounded Vital Instrument and Control Distribution PNL 2E-PNB-D26	4
02-E-PNF-0001	Control Wiring Diagram Instrument AC Class 1E Power System 120V AC Distribution Panel Voltage Regulator 2E-PNA-V25	3
02-E-PNB-0003	Elementary Diagram 120VAC CLS 1E PWR SYS Ungrounded Vital I&C Distribution PNL 2E-PNB-D26, PND-D28	3
02-E-PNB-0001	Elementary Diagram Instrument AC Class 1E Power System 120V AC Panel Voltage Regulator 2E-PNA-V25	4
02-E-PNA-0002	Single Line Diagram 120V AC Class 1E Power System Ungrounded Vital Instrumentation and Control Distribution Panels 2E-PNB-D26 and 2E-PND-D28	14
01-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	48
01-M-SIP-002	P & I Diagram Safety Injection & Shutdown Cooling System	37

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-MC-SI-240	LPSI System Performance Evaluation and Surveillance Requirement Basis Calculation	0

WORK ORDER

3583602

PERMITS

190148 19351 197868 201486

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Design Inputs Requirements Checklist, Replacement of the Unit 2 Train A Essential Cooling Water Heat Exchanger (2MEWAE01**HTEXCH)	0
	ASME OM-2009, Part 21 Inservice Performance Testing of Heat Exchangers in Light Water Reactor Power Plants	
MN950-A00011	B&W Inspection & Test Plan (Nuclear) –Hydrostatic Test & Final Assembly	1
MN950-00012	B&W Data Acquisition Procedure for the Inspection of Non-Ferromagnetic Heat Exchanger Tubing	0
	EPRI Service Water Heat Exchanger Testing Guidelines Technical Report TR-107397	March 1998
EPRI NP-7552	Heat Exchanger Performance Monitoring Guidelines	December 1991
	Work Order 3674378	
13-EN-0306	Installation Specification for Cable Splicing and Terminations	12
VTD-S250-0009	Vendor Technical Diagram, Solid State Controls, Inc. Instruction and Operation Manual for 25 KVA Voltage Regulators	1
	Technical Specification 3.5.4	
	Safety Evaluation for Technical Specification Amendment 124	
	Risk assessment for LPSI A work dated May 30, 2011	
	Work Order 3773980	June 8, 2011
	Engineering Evaluation 3774184	June 8, 2011
	LDCR 2011-R002	June 8, 2011
	Flush Plan Unit-2 EW Heat Exchanger – 2A	April 12, 2011

Section 1R20: Refueling and Other Outage Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
70DP-0RA01	Shutdown Risk Assessments	37
72PA-9ZZ07	Reload Power Ascension Test	32
72PY-9RX04	Low Power Physics Tests Using RMAS	20

PALO VERDE ACTION REQUESTS

3590931 3705507 3707197 3706292 3705815

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
02-M-PCP-001	P & I Diagram Fuel Pool Cooling & Cleanup System	25
02-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	42

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
SI STM Volume 40	System Training Manual- Safety Injection System (SI)	4
	Shutdown Safety Function Assessment, Core Off-loaded, Refuel Pool isolated from Spent Fuel Pool	April 12, 2011
	Unit 2 16 th Refueling Outage Schedule	6
	Unit 2R16 Surveillance Plan	February 10, 2011
	Engineering Evaluation 3591113	March 8, 2011
AN449-A00090	Containment Coatings Walkdown Palo Verde Nuclear Power Station Unit 1	1
COR# 09-9-014	2R15 Containment Coatings Assessment	0

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
73ST-9CL01	Containment Leakage Type "B" and "C" Testing	37
40ST-9RC02	ERFDADS (Preferred) Calculation of RCS Water Inventory	51
40OP-9RC03	RCS Leakage Source Determination	4
40ST-9GT04	Station Blackout Generator 1 Quarterly Test	3
73ST-9AF04	AFA-P01 Full Flow – Inservice Test	13
73ST-9SI02	Containment Spray Nozzle Air Test	8
73TI-9SG03	ADV 30% Partial Stroke Test	6
73DP-9ZZ14	Surveillance Testing	19
73ST-9S102	Containment Spray Nozzle Test	8
73PR-0AP04	Control Room Envelope Habitability Program	0
33ST-0HJ01	Control Room Airflow Capacity and Pressurization Test	14

PALO VERDE ACTION REQUESTS

373481	3682522	3729757	3730948	3729622	3701484	3693053
369053	3717692	3706598	3728035	3728647		

WORK ORDER

3419826	3167372	3474284
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MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Work Order 3474284	
	Work Order 3372106	
	Work Order 3540605	
	Work Order 3699913	
	Work Order 3715134	
	Work Order 3715052	

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Work Order 3715136	
	Work Order 3701552	
	Work Order 3699915	

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
13-P-ZCG-118	Unit-2 Containment Spray Isometric Drawings Elevation 120'	9
13-P-ZCG-120	Unit-2 Containment Spray Isometric Drawings Elevation 100'	7
02-M-SIP-001	P & I Diagram Safety Injection & Shutdown Cooling System	42

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Unit-2 Containment Spray B-Loop Thermograph Image B 3200005	April 12, 2011
	Unit-2 Containment Spray B-Loop Thermograph Image B 3200017	April 12, 2011
	Unit-2 Containment Spray B-Loop Thermograph Image B 3200051	April 12, 2011

Section 1EP1: Exercise Evaluation

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
EPIP-01	Satellite Technical Support Center Actions	36
EPIP-02	Operations Support Center Actions	35
EPIP-04	Emergency Operations Facility Actions	51
EPIP-99	EPIP Standard Appendices	30

Section 1EP1: Exercise Evaluation

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
79IS-9SM01	Analyses of Seismic Event	23
	Technical Requirements Manual Section 3.3.103	
	Request for Training Assistance	March 3, 2011
	Letter from Monica Ray to Distribution (240-02699-MZR/TBW), "2009 Feb 4 Emergency Preparedness Full Scale Drill Report,"	February 9, 2009
	Letter from Monica Ray to Distribution (240-02701-MZR/TBW), "2009 March 4 Emergency Preparedness Full Scale Exercise Report,"	March 11, 2009
	Letter from Monica Ray to Distribution (240-02769-MZR/TBW), "2009-JUN-18 Health Physics Drill Report,"	June 25, 2009
	Letter from Monica Ray to Distribution (240-02710-MZR/TBW), "June 2009 Emergency Response Organization (ERO) Drill Report,"	July 16, 2009
	Letter from Monica Ray to Distribution (240-02715-MZR/TBW), "2009-AUG-19 EP Assembly & Accountability Report,"	September 4, 2009
	Letter from Monica Ray to Distribution (240-02719-MZR/TBW), "2009 Sep 10 Emergency Preparedness Contaminated Injury/Medical Drill,"	October 2, 2009
	Letter from Monica Ray to Distribution (240-02722-MZR/TBW), "September 23, 2009 Hostile Action Based (HAB) Table Top Drill Report,"	October 23, 2009
	Letter from Monica Ray to Distribution (240-02730-MZR/TBW), "December 10, 2009 Hostile Action Based (HAB) Drill Report,"	January 22, 2010
	Letter from Monica Ray to Distribution (240-02730-MZR/TBW), "February 2010 Emergency Response Organization (ERO) Table Top Drill Report,"	March 12, 2010
	Letter from Monica Ray to Distribution (240-02701-MZR/TBW), "2010 March 10 Emergency Preparedness Full Scale Exercise Report,"	March 30, 2010
	Letter from Steve Sawtschenko to Distribution (240-02748- SS/TBW), "2010-May-19 Health Physics Drill Report,"	May 20, 2010
	Letter from Steve Sawtschenko to Distribution (240-02770- SS/TBW), "June 2010 Emergency Response Organization (ERO) Table Top Drill Report,"	August 18, 2010
	Letter from Steve Sawtschenko to Distribution (240-02756- SS/TBW), "September 21, 2010 Health Physics Drill Report,"	October 6, 2010

Section 1EP1: Exercise Evaluation**PROCEDURES**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Letter from Steve Sawtschenko to Distribution (240-02755-SS/TBW), "Emergency Response Organization (ERO) 3 rd Quarter Table Top Drill Report,"	October 6, 2010
	Letter from Steve Sawtschenko to Distribution (240-02759-SS/TBW), "November 16, 2010 Environs Drill Report,"	December 2, 2010
	Letter from Steve Sawtschenko to Distribution (240-02761-SS/DWC), "2010-NOV-16 Severe Accident Management Guideline (SAMG) Drill,"	November 24, 2010
	Letter from Steve Sawtschenko to Distribution (240-02762-SS/TBW), "Nov 18, 2010 Station Assembly – Accountability Drill Report,"	December 2, 2010
	Letter from Steve Sawtschenko to Distribution (240-02768-SS/TBW), "Emergency Response Organization (ERO) Table Top Drill Report,"	January 20, 2011
	Drill Report – 2009-10-21, Final Report-Radiological Emergency Preparedness (REP) Program, FEMA	December 30, 2009

PALO VERDE ACTION REQUESTS

3281100	3294500	3297861	3311569	3306717	3350157	3351146
3351401	3351474	3351476	3373912	3427525	3413966	3431420
3435956	3443553	3446838	3490382	3490067	3491038	3523771
3525559	3525915	3548726	3624673	3632984	3633000	3633013
3633015	3633018	3633022	3633036	3633044	3633050	3633057
3633073	3633082	3633100	3633101	3633237	3634293	3634592
3634680	3635005	3590117	3624077	3635005		

Section 4OA1: Performance Indicator Verification**PROCEDURES**

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
16DP-OEP19	Performance Indicator Emergency Preparedness Cornerstone	13

Section 40A1: Performance Indicator Verification

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Updated Report Alert and Notification System	March 26, 2007
	Siren Operating Manual	September 2010
70DP-0PI01	Performance Indicator Data Mitigating Systems Cornerstone	5
93DP-0LC09	Data Collection and Submittal Using INPO's Consolidated Entry System	10

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Units 1, 2, and 3 Mitigating Systems Performance Indicator Consolidated Entry Derivation Reports	March 2011
	Units 1, 2, and 3 Operating Logs	April 1, 2010 through March 31, 2011
	Units 1, 2, and 3 Margin Reports for Mitigating Systems Performance Indicator	April 1, 2010 through March 31, 2011
	PVNGS – Maintenance Rule Mode Summary Report	April 1, 2010 through March 31, 2011
	Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – HPSI A	March 24, 2010 through March 31, 2011
	Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – DG B	March 24, 2010 through March 31, 2011

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – HPSI B	March 24, 2010 through March 31, 2011
	Units 1, 2, and 3, PVNGS – Maintenance Rule Unavailability Detail Report with Mode Changes – MSPI – DG A	March 24, 2010 through March 31, 2011
	NEI 99-02, Regulatory Assessment Performance Indicator Guideline	6

Section 4OA2: Identification and Resolution of Problems

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
30DP-9MP01	Conduct of Maintenance	62
01DP-0AP12	Palo Verde Action Request Processing	15
90DP-0IP10	Condition Reporting	49
90DP-0IP12	Root Cause CRDR Evaluation	7
13-EN-306	Installation Specification for Cable Splicing and Terminations	11
12DP-0MC46	Receipt Inspection	8
40DP-9OP26	Operations PVAR Processing and Operability/Functional Assessment	31

PALO VERDE ACTION REQUESTS

3588800	3587225	3534118	3543282	3553899	3553900	3687556
3730912	3721235	3704003				

CONDITION REPORTS / DISPOSITION REQUESTS

3616634	3602644	3540575	3545675	3689079	3545675
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CONDITION REPORTS ACTION ITEM

3573209	3590618	3690821	3690732	3690875	3689079
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WORK ORDER

3588803	3392503	2970233	3469325
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MISCELLANEOUSNUMBERTITLEDATE

Operator Work Arounds List

May 31, 2011

Operator Burdens List

May 31, 2011

Work Order 3473682

Work Order 3473683

Work Order 3473684

Event notification worksheet EN#46633

February 21,
2011

ASME B&PV Code Section III

1974 edition
with winter
addenda

ASME B&PV Code Section XI

2001edition
with 2003
addenda**Section 40A3: Event Follow-Up**PROCEDURESNUMBERTITLEREVISION

91DP-0EN71	Chemical Use Procedure
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5

Section 4OA3: Event Follow-UpPROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EP-0901	Classifications	0
	PVNGS Emergency Plan	46

PALO VERDE ACTION REQUESTS

3790634 3053031 3223337

CONDITION REPORTS / DISPOSITION REQUESTS

3053981 3053737 3224074

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Material Safety Data Sheet, Fyrquel 220 MLT	May 16, 2006
	Palo Verde Nuclear Generating Station Chemical Use Permit Number 6859	August 11, 2005
	Unit 3 Control Room Operations Log	June 23, 2011
	CRDR 3053981 (Significant), CRDR 3053737 (ACE) Auxiliary Feedwater Isolation Valves Stroke Time Testing Significant CRDR Investigation Report	2
	Significant CRDR 3224074, Unit 3 Manual Reactor Trip Due To MG Set 'B' Control Failure, Root Cause Analysis Report	3