



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

August 3, 2009

EA-2009-050

Randall K. Edington,  
Executive Vice President, Nuclear  
and Chief Nuclear Officer  
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Arizona Public Service Company  
P.O. Box 52034  
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000528/2009003, 05000529/2009003, AND  
05000530/2009003

Dear Mr. Edington:

On June 30, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed integrated report documents the inspection findings, which were discussed on July 17, 2009, with Mr. R. Bement and other members of your staff.

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

This report documents two NRC-identified findings and one self-revealing finding of very low safety significance (Green), and three Severity Level IV violations. All of these findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance of these violations and because they were entered into your corrective action program, the NRC is treating these findings as noncited violations consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest these noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission Region IV, 612 E. Lamar Blvd., Suite 400, Arlington, Texas 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at Palo Verde Nuclear Generating

Station, Units 1, 2, and 3, facility. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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

Sincerely,

***/RA/***

Michael C. Hay, Chief  
Projects, Branch D  
Division of Reactor Projects

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

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

Enclosure: NRC Inspection Report 05000528/2009003, 05000529/2009003, and  
05000530/2009003

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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	DBA
<b>RIV:RI:DRP/D</b>	<b>RI:DRP/D</b>	<b>RI:DRP/D</b>	<b>SRI:DRP/D</b>	<b>SPE:DRP/D</b>	<b>C:DRS/PSB1</b>
JBashore	MCatts	JMelfi	RTreadway	DAllen	MShannon
<i>E-mail DAllen for</i>	<i>E-mail DAllen for</i>	<i>E-mail DAllen for</i>	<i>E-mail DAllen for</i>	<i>/RA/</i>	<i>/RA/</i>
7/21/09	7/21/09	7/21/09	7/21/09	7/27/09	7/31/09
<b>C:DRS/PSB2</b>	<b>C:DRS/EB1</b>	<b>C:DRS/EB2</b>	<b>C:DRS/OB</b>	<b>ACES</b>	<b>C:DRP/D</b>
GWerner	TFarnholtz	NO'Keefe	RLantz	MHaire	MHay
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**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

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

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

Report: 05000528/2009003, 05000529/2009003, 05000530/2009003

Licensee: Arizona Public Service Company

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

Location: 5951 S. Wintersburg Road  
Tonopah, Arizona

Dates: April 1 through June 30, 2009

Inspectors: J. Bashore, Resident Inspector  
M. Catts, Resident Inspector  
J. Melfi, Resident Inspector  
R. Treadway, Senior Resident Inspector  
J. Adams, Reactor Inspector  
S. Alfernick, Reactor Inspector  
L. Carson II, Senior Health Physicist  
S. Hedger, Reactor Inspector  
P. Jayroe, Reactor Inspector  
M. Young, Reactor Inspector

Approved By: Michael C. Hay, Chief, Project Branch D  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000528/2009003, 05000529/2009003, 05000530/2009003; 04/01/09-06/30/09; Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Integrated Res and Reg Rpt; Fire Prot; Heat Sink Perf; Oper Eval; Refuel and Outage Activities; and Other Activities.

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

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Initiating Events

- Green. A self-revealing noncited violation of Technical Specification 5.4.1(a), "Procedures," was identified for the failure of operations personnel to follow procedural requirements during a planned plant startup. Specifically, on May 27, 2009, operations personnel did not take actions to lower turbine load after synchronizing the generator to the offsite electrical distribution grid during cooldown, causing a pressurizer low level alarm and a loss of pressurizer heaters. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3336555.

The finding is more than minor because it is associated with the human performance attribute of the Initiating Events Cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and power operations. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance because the finding did not result in exceeding the technical specification limit for identified reactor coolant system leakage, did not affect other mitigation systems, did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available; and did not increase the likelihood of a fire or internal/external flood. This finding has a crosscutting aspect in the area of human performance associated with decision making because operations personnel failed to properly implement their roles in communicating between applicable operational personnel [H.1(a)](Section 1R20).

#### Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of License Condition 2.C.(7), "Fire Protection Program," for the failure of fire protection personnel to implement fire protection plan requirements. Specifically, from June 8-12, 2009, fire protection personnel did not identify that a fire barrier door between the Unit 1 emergency diesel generator Train B room and the Unit 1

diesel generator Train B control room was obstructed, preventing the door from performing its design function of closing if a fire occurred, and therefore failed to implement compensatory actions. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3343933.

The finding is more than minor because it was associated with the protection against external factors (fires) attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors conducted a Phase I significance determination process screening utilizing Attachment 1 of Appendix F. In accordance with the Phase I screening criteria, this finding was assigned a category of "Fire Confinement," and a category of "Low Degradation Rating," because the degraded fire barrier door did not affect more than one fire area. Using the qualitative screening criteria of Appendix F, this finding was determined to have very low safety significance because more than one fire area was not affected, and because the other emergency diesel generator would be credited to safely shutdown the plant. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee did not ensure a low threshold for identifying issues and ensure that conditions adverse to quality were identified completely, accurately, and in a timely manner commensurate with their safety significance [P.1(a)](Section 1R05).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of operations, chemistry, and engineering personnel to develop a procedure with appropriate quantitative or qualitative acceptance criteria for chloride levels to ensure operability of the essential cooling water system heat exchangers. Specifically, from plant startup until April 28, 2009, chemistry personnel's Policy CDP1-14, "Chemistry Department Policies," stated, in part, that a Palo Verde Action Request will be generated for entry into any Action Level 1, 2, 3 or 5, and did not give actions for Action Level 4. This resulted in chlorides exceeding Action Level 4 quantitative acceptance criterion in the essential cooling water system Train A without a Palo Verde Action Request being generated, or an operability determination being performed in a timely manner. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3347097.

The finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance because the finding did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of human performance associated with decision-making because decisions and the basis for decisions were not communicated to personnel who have a need to

know the information in order to perform work safely, in a timely manner [H.1(c)](Section 1R07).

- Severity Level IV. The inspectors identified a noncited Severity Level IV violation of 10 CFR 50.59 requirements for the failure of engineering personnel to perform adequate written safety evaluations prior to implementing changes to the emergency core cooling system. Specifically, between 1987 and February 2009, engineering personnel failed to obtain prior NRC approval for a change that involved two unreviewed safety questions involving emergency core cooling system operability and containment bypass leakage during an accident. The first example involved a change in an emergency core cooling system lineup that could have prevented the fulfillment of the safety functions of the safety injection system to remove residual heat and mitigate the consequences of an accident. The second example involved opening normally locked close valves, while the plant is operating, that could result in the loss of a safety function to control the release of radioactive material as a result of the containment bypass path. This issue was entered into the licensee's corrective action program as Condition Report / Disposition Request 3287805.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. This finding is also more than minor because it is associated with the configuration control attribute of the Barrier Integrity Cornerstone and adversely affects the cornerstone objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. In accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Disposition Screening," the inspectors determined that traditional enforcement applied because this issue may have impacted the NRC's ability to perform its regulatory function, and should be evaluated using the traditional enforcement process. The issue was classified as Severity Level IV because the violation of 10 CFR 50.59 involved conditions evaluated as having very low safety significance by the Significance Determination Process. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding required a Phase 2 analysis because the finding represented a loss of safety system function of the safety injection system. The Phase 2 analysis determined that this finding was potentially greater than Green; therefore, a Phase 3 analysis was completed by a regional senior reactor analyst. The Phase 3 analysis determined that this issue was of very low safety significance based on the senior reactor analyst reviewing the licensee's risk estimate of the condition which concluded that the incremental conditional core damage probability was much less than 1.0E-7. The analyst checked portions of the licensee's analysis using the Palo Verde SPAR model, and found the licensee results to be acceptable. Therefore, the significance of the finding was determined to be very low (Green). This finding was evaluated as not having a crosscutting aspect because the performance deficiency is not indicative of current performance (Section 1R15).

- Severity Level IV. The inspectors identified a noncited Severity Level IV violation of License Condition 2.C.(7) when a security officer willfully failed to complete fire

watch tours on September 1, 2008. The inspectors concluded that the officer failed to complete the required fire watch tours due to a careless disregard for the regulations on the part of the individual. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3219290.

The failure to conduct two required hourly fire watch tours is a performance deficiency. This issue was dispositioned using traditional enforcement due to the willful aspects of the performance deficiency. In accordance with Section IV.A.4 of the Enforcement Policy, this issue is considered more than minor due to the willful aspects of the performance deficiency. In accordance with the guidance in Supplement I of the Enforcement Policy, this issue is considered a Severity Level IV noncited violation because it was identified by the licensee, involved isolated acts of a low-level individual, and was addressed by appropriate remedial action. There were no crosscutting aspects associated with this performance deficiency (Section 4OA5)(EA-2009-050).

- Severity Level IV. The inspectors identified a noncited Severity Level IV violation of 10 CFR 50.9 requirements when a security officer deliberately falsified fire watch logs. Specifically, on September 1, 2008, the officer failed to perform two fire watch tours and then signed the fire watch logs indicating that the tours were completed as required. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3219290.

The failure to provide complete and accurate information on the fire watch log is a performance deficiency. This issue was dispositioned using traditional enforcement due to the willful aspects of the performance deficiency. Furthermore, the failure to provide complete and accurate information has the potential to impact the NRC's ability to perform its regulatory function. In accordance with Section IV.A.4 of the Enforcement Policy, this issue is considered more than minor due to the willful aspects of the performance deficiency. In accordance with the guidance in Supplement I of the Enforcement Policy, this issue is considered a Severity Level IV noncited violation because it was identified by the licensee, involved isolated acts of a low-level individual, and was addressed by appropriate remedial action. There were no crosscutting aspects associated with this performance deficiency (Section 4OA5)(EA-2009-050).

#### B. Licensee-Identified Violations

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

## REPORT DETAILS

### Summary of Plant Status

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

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

Unit 3 operated at full power until April 4, 2009, when the unit was shutdown for Refueling Outage 15. The unit was restarted on May 23, 2009, returned to full power on May 31, 2009, and remained at full power for the duration of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### **1R04 Equipment Alignment (71111.04)**

##### **.1 Partial Walkdown**

##### **a. Inspection Scope**

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

- June 10, 2009, Unit 1, emergency diesel generator Train A while Train B was being painted
- June 22, 2009, Unit 1, emergency diesel generator Train B while Train A was being painted
- June 25, 2009, Unit 2, safety injection and containment spray systems Train B during Train A maintenance

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

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

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

On May 7, 2009, the inspectors performed a complete system alignment inspection of the Unit 3 containment spray system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, and support systems, to ensure ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings of significance were identified.

**1R05 Fire Protection (71111.05)**

Quarterly Fire Inspection Tours

a. Inspection Scope

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

- April 22, 2009, fire pump house and station blackout gas turbine generators
- April 22, 2009, Unit 2, auxiliary building, 40 foot, 51 foot, 70 foot, and 88 foot elevations
- April 23, 2009, Unit 2, main steam support structure, 80 foot, 100 foot, 120 foot, and 140 foot elevations

- June 3, 2009, Unit 1, auxiliary building, 100 foot, 120 foot, and 140 foot elevations
- June 10, 2009, Unit 1, emergency diesel generator building, 100 foot, 115 foot, and 131 foot elevations

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

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

b. Findings

Introduction. The inspectors identified a Green noncited violation of License Condition 2.C.(7), "Fire Protection Program," for the failure of fire protection personnel to implement fire protection plan requirements. Specifically, from June 8-12, 2009, fire protection personnel did not identify that a fire barrier door between the Unit 1 emergency diesel generator Train B room and the Unit 1 diesel generator Train B control room was obstructed, preventing the door from performing its design function of closing if a fire occurred.

Description. On June 10, 2009, the inspectors identified that fire barrier auto drop/roll-up door between the Unit 1 emergency diesel generator Train B room and the Unit 1 diesel generator Train B control room was obstructed which prevented it from closing as required by the site fire protection program. This door is normally held open by a fusible link connected to a lever arm that secures the roll-up door. During an actual fire, the fusible link melts, the lever arm drops, and the roll up door drops providing protection between the two rooms. On June 8, 2009, maintenance personnel completed erection of the scaffolding in the emergency diesel generator Train B room to facilitate painting of the interior walls. One of the scaffolding platforms was staged in such a manner that it would have prevented the roll-up door level arm from falling the distance necessary for the roll-up door to drop.

The inspectors reviewed Procedure 14DP-0FP31, "Fire System Impairment," Revision 13, which stated that if any fire barrier listed in Procedure 14DP-0FP02, "Fire

System Impairments and Notifications,” Revision 14, Appendix D, became degraded, impaired, or nonfunctional, then compensatory actions are required such as to establish a roving fire watch patrol within one hour, and the appropriate documentation shall be initiated. Procedure 14DP-0FP02, Appendix D, listed the auto drop/roll-up doors as doors that require compensatory actions. On June 10, 2009, the inspectors notified operations personnel that scaffolding was impeding the ability of the fire barrier door to perform its intended function if needed during an actual fire scenario. On June 12, 2009, the licensee took actions to correct the scaffolding and informed the inspectors that the fire barrier door was no longer nonfunctional. The licensee wrote Palo Verde Action Request 3342256 to address untimely corrective actions between when the inspectors identified the issue on June 10, 2009, and when the issue was corrected.

Analysis. The performance deficiency associated with this finding is the failure of fire protection personnel to ensure that fire barrier auto drop/roll-up doors remain functional and free of obstruction. The finding is more than minor because it is associated with the protection against external factors (fires) attribute of the Mitigating Systems Cornerstone and affects the objective to maintain the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix F, “Fire Protection Significance Determination Process,” the inspectors conducted a Phase I significance determination process screening utilizing Attachment 1 of Appendix F. In accordance with the Phase I screening criteria, this finding was assigned a category of “Fire Confinement,” and a category of “Low Degradation Rating,” because the degraded fire barrier door did not affect more than one fire area. Using the qualitative screening criteria of Appendix F, this finding was determined to have very low safety significance because more than one fire area was not affected, and because the other emergency diesel generator would be credited to safely shutdown the plant. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee did not ensure a low threshold for identifying issues and ensure that conditions adverse to quality were identified completely, accurately, and in a timely manner commensurate with their safety significance [P.1(a)].

Enforcement. Arizona Public Service Company Operating License NPF 41, 51 and 74, License Condition 2.C.(7), “Fire Protection,” requires that the licensee implement and maintain in effect all the provisions of the approved fire protection plan as described in the Updated Final Safety Analysis Report for the facility, as supplemented and amended, and as approved in the Safety Evaluation Report through Supplement 11. Updated Final Safety Analysis Report Section 9.5.1.5, “PVNGS Fire Protection Program,” states, in part, that procedures for implementing the fire protection program shall be prescribed to ensure defense-in-depth protection of the public health and safety in the event of a fire. Procedure 14DP-0FP31, “Fire System Impairment,” Revision 13, stated that if any fire barrier listed in Procedure 14DP-0FP02, “Fire System Impairments and Notifications,” Revision 14, Appendix D, became degraded, impaired, or nonfunctional, then compensatory actions were required such as to establish a roving fire watch patrol within one hour, and the appropriate documentation shall be initiated. Procedure 14DP-0FP02, Appendix D, listed the auto drop/roll-up doors as doors that require compensatory actions. Contrary to the above, between June 8 and 12, 2009, fire protection personnel did not implement the fire protection program requirements to either ensure that the fire barrier auto drop/roll-up door between the Unit 1 emergency diesel generator Train B room and the diesel generator Train B control room remained operable or establish compensatory measures. Because the finding was of very low safety significance

(Green) and has been entered into the licensee's corrective action program as Palo Verde Action Request 3342256, this violation is being treated as a noncited violation, consistent with Section IV.A.1 of the NRC Enforcement Policy: NCV 05000528/2009003-01, "Inoperable Fire Barrier Door for Emergency Diesel Generator Train B."

## **1R07 Heat Sink Performance (71111.07)**

### Annual Review

#### 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 Train A heat exchanger. 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 Electric Power Research Institute 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

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of operations, chemistry, and engineering personnel to develop a procedure with appropriate quantitative or qualitative acceptance criteria for chloride levels to ensure operability of the essential cooling water system heat exchangers.

Description. On April 2, 2009, chemistry personnel obtained an essential cooling water sample to measure chlorides; however, due to equipment issues, did not analyze the sample until April 26, 2009. On April 26, 2009, the sample indicated chlorine levels of 6197 ppb, which exceed the Action Level 4 limit of 5000 ppb. Chemistry personnel wrote chemistry control Instruction 09-081 on April 27, 2009, for the Unit 2 control room to inform operations personnel that a backup sample would be taken at the next available opportunity. On April 28, 2009, chemistry personnel wrote Palo Verde Action Request 3319258 due to the essential cooling water Train A chloride analysis exceeding the 5000 ppb Action Level 4 limit at 7955 ppb, and an immediate operability determination was performed by the control room. The high chlorides indicated a leak in the essential cooling water heat exchanger Train A from the essential spray ponds to the essential cooling water system. The control room determined the small size of the leak had no current operability impact on the essential cooling water heat exchanger.

The essential cooling water system is a closed loop cooling system. High chlorides in the essential cooling water system occur when a tube in the essential cooling water

system has a leak, and water from the essential spray ponds leaks into the essential cooling water system. This degraded condition requires an operability assessment since a high chloride condition increases the potential for issues with chloride induced corrosion, heat exchanger structural integrity, heat exchanger heat transfer capability, and essential spray pond inventory since the essential cooling water system is at a lower pressure than the spray pond system.

During their review, the inspectors noted that the high chloride samples were obtained on April 26, 2009, but a Palo Verde Action Request was not generated, and an operability determination was not performed until April 28, 2009. The inspectors reviewed Palo Verde Policy CDP1-14, "Chemistry Department Policies," Revision 14, which stated that a Palo Verde Action Request will be generated for entry into any Action Level 1, 2, 3 or 5. Chemistry Procedure 74DP-9CY04, "Systems Chemistry Specification," Revision 61, Section 3.10, defined Action Level 4 requirements for chlorides greater than 5,000 ppb. The inspectors determined that this procedure was inadequate since the procedure did not require a Palo Verde Action Request for an Action Level 4 sample, resulting in operations personnel not performing an operability determination as required by Palo Verde's corrective action program. The inspectors also noted that while a Palo Verde Action Request was not generated, a chemistry control instruction was written informing the control room of this condition adverse to quality. The inspectors noted that Procedure 40DP-9OP26, "Operability Determination and Functional Assessment," Revision 25, stated in Section 3.1.1, "the formal operability determination process is entered upon discovery of circumstances where the operability of any structure, system or component described in technical specifications is called into question or upon discovery of conditions that could affect the function or functional capability of the structure, system or component."

The inspectors also determined that clear communication did not exist between operations, chemistry, and engineering personnel to ensure the operability of the essential cooling water heat exchangers. Chemistry personnel set the chloride limits in Procedure 74DP-9CY04 specifically to address the chemistry effects of chlorides; however, operations and engineering personnel were using the chloride limits in Procedure 74DP-9CY04 to determine if the heat exchanger had a tube leak and needed an operability determination.

On January 15, 2009, the licensee took actions specified in Condition Report Action Item 3211312 to add the Action Level 4 limit of 5,000 ppb into Procedure 74DP-9CY04. This was a corrective action, after a heat exchanger tube leak was found on the Unit 2 Train A essential cooling water heat exchanger, to alert operations personnel when potential essential cooling water heat exchanger in-leakage was occurring. However, the inspectors determined this was not an adequate action to alert operations personnel to heat exchanger leakage because the procedure did not give guidance to write a Palo Verde Action Request or to alert operations personnel of elevated chlorides.

The inspectors communicated their issues to the licensee, and chemistry personnel wrote Palo Verde Action Request 3347097. The licensee plans on changing Policy CDP1-14 to include instructions for a Palo Verde Action Request to be generated if entry into any Action Level (1, 2, 3, 4, or 5) occurred. This ensures operations personnel will review high chloride issues in the heat exchangers, and perform an operability determination, if required.

Analysis. The performance deficiency associated with this finding is the failure of operations, chemistry, and engineering personnel to develop a procedure with appropriate quantitative or qualitative acceptance criteria for chloride levels to ensure operability of the essential cooling water system heat exchangers. The finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems Cornerstone and affects the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance because the finding did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of human performance associated with decision-making because decisions and the basis for decisions were not communicated to personnel who have a need to know the information in order to perform work safely, in a timely manner [H.1(c)].

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires that activities affecting quality shall be prescribed by instructions, procedures, or drawings, and shall be accomplished in accordance with those instructions, procedures, and drawings. The instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Chemistry Procedure 74DP-9CY04, "Systems Chemistry Specification," Revision 61, Section 3.10, defined an Action Level 4 for chlorides greater than 5,000 ppb. Contrary to the above, from plant startup until April 28, 2009, operations, chemistry, and engineering personnel failed to develop a procedure with appropriate quantitative or qualitative acceptance criteria for chloride levels to ensure operability of the essential cooling water system heat exchangers. Specifically, Policy CDP1-14, "Chemistry Department Policies," stated that a Palo Verde Action Request will be generated for entry into any Action Level 1, 2, 3 or 5, but did not provide actions for Action Level 4. This resulted in chlorides exceeding Action Level 4 quantitative acceptance criterion in the essential cooling water system Train A without a Palo Verde Action Request being generated, or an operability determination being performed in a timely manner. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Palo Verde Action Request 3347097, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000528;529;530/2009003-02, "Failure to Develop an Adequate Procedure to Ensure Operability of the Essential Cooling Water Heat Exchangers."

## **1R08 Inservice Inspection Activities (71111.08)**

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

#### **a. Inspection Scope**

The inspection procedure requires review of two or three types of nondestructive examination activities and, if performed, one to three welds on the reactor coolant

system pressure boundary. It also requires review of one or two examinations with relevant indications (if any were found) that have been accepted by the licensee for continued service.

The inspectors directly observed the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Chemical Volume & Control	3PCHNV-866 (3156882-1)	Radiography Test
Chemical Volume & Control	3PCHNV-866 (3156882-2)	Radiography Test
Shutdown Cooling	Shutdown Cooling Heat Exchanger B (45° & 60°) Weld Number (75-76)	Ultrasonic Test
Shutdown Cooling	Shutdown Cooling Heat Exchanger B – Nozzle Inner Radius (70°) Weld Number (75-76)	Ultrasonic Test
Shutdown Cooling	Shutdown Cooling Heat Exchanger B Weld Number (75-76)	Ultrasonic Test
Shutdown Cooling	Shutdown Cooling B Butter Layer (WOL-006B)	Ultrasonic Test

The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Chemical Volume & Control	3PCHNV-866 (3156882-1)	Radiography Test
Shutdown Cooling	Shutdown Cooling A Pre-weld nondestructive examination (WOL-006A)	Penetrant Test
Shutdown Cooling	Shutdown Cooling A Pre-weld Info only nondestructive examination (WOL-006A)	Penetrant Test

Shutdown Cooling	Shutdown Cooling B Pre-weld nondestructive examination (WOL-006B)	Penetrant Test
Shutdown Cooling	Shutdown Cooling B Post Butter Layer (WOL-006B)	Penetrant Test
Shutdown Cooling	Shutdown Cooling A Butter Layer (WOL-006A)	Penetrant Test
Shutdown Cooling	Shutdown Cooling A Bridge Bead Information Only (WOL-006A)	Penetrant Test
Shutdown Cooling	Shutdown Cooling B Bridge Bead Info Only (WOL-006B)	Penetrant Test
Auxiliary Feedwater	Terry Turbine Governor Valve Seat Seal Weld (3MAFAK01)	Penetrant Test

During the review and observation of each examination, the inspectors verified that activities were performed in accordance with American Society of Mechanical Engineers Boiler and Pressure Vessel Code requirements and applicable procedures. Indications were compared with previous examinations and dispositioned in accordance with American Society of Mechanical Engineers Code and approved procedures. The qualifications of all nondestructive examination technicians performing the inspections were verified to be current.

None of the above observed or reviewed nondestructive examinations identified any relevant indications and cognizant licensee personnel stated that no relevant indications were accepted by the licensee for continued service.

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

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>WELD TYPE</u>
Shutdown Cooling	Shutdown Cooling A Dissimilar Metal Weld (WOL-006A)	Overlay, Automated Machine
Shutdown Cooling	Shutdown Cooling B Dissimilar Metal Weld (WOL-006B)	Overlay, Automated Machine
Chemical Volume & Control	3PCHNV-866 (3156882-1)	Gas Tungsten Arc Weld, Manual

Chemical Volume & Control	3PCHNV-866 (3156882-2)	Gas Tungsten Arc Weld, Manual
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The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with American Society of Mechanical Engineers Code, Section IX, requirements. The inspectors also verified through 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.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The licensee performed the required visual inspection of pressure-retaining components above the reactor pressure vessel head. A visual inspection was performed of components above the head outside of the insulation package. The inspectors reviewed the video results of this inspection for evidence of leaks or boron deposits at reactor pressure boundaries and related insulation above the head.

The licensee also performed volumetric and surface examinations of the J-welds associated with all penetrations in the reactor pressure vessel head. The inspectors observed the data collection, data analysis, and/or special interest inspections of nine penetration J-welds – penetrations 18, 19, 24, 26, 30, 37, 43, 48, and 49. The inspectors also reviewed procedures, nondestructive examination technician qualification certifications, etc. to ensure the examinations were performed in accordance with the American Society of Mechanical Engineers code and approved industry standards.

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

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion.

The inspection procedure required review of a sample of boric acid corrosion control walkdown visual examination activities through either direct observation or record review. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedure 73DP-9ZC01, "Boric Acid Corrosion Control Program," Revision 2 and Procedure 70TI-9ZC01, "Boric Acid Walkdown Leak Detection," Revision 8. Visual records of the components and equipment were also reviewed by the inspectors. The inspection procedure required verification that visual inspections emphasize locations where boric acid leaks can cause degradation of safety significant components. The inspectors verified through record review that the boric acid corrosion control inspection efforts were directed towards locations where boric acid leaks can cause degradation of safety-related components.

Additionally, the inspectors independently performed examinations of piping and components containing boric acid during a walkdown of the containment building. On those components where boric acid was identified, the engineering evaluations gave assurance that the American Society of Mechanical Engineers Code wall thickness limits were properly maintained. The evaluations also confirmed that the corrective actions performed for evidence of boric acid leaks were consistent with requirements of the American Society of Mechanical Engineers Code.

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

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspection procedure specified performance of an assessment of in situ screening criteria to assure consistency between assumed nondestructive examination flaw sizing accuracy and data from the Electric Power Research Institute examination technique specification sheets. It further specified assessment of appropriateness of tubes selected for in situ pressure testing, observation of in situ pressure testing, and review of in situ pressure test results. No conditions were identified that warranted in situ pressure testing. The inspectors observed data collection and/or analysis on several tubes to ensure the inspection was performed in accordance with American Society of Mechanical Engineers code requirements and industry standards. The inspectors also reviewed nondestructive examination technician qualification certifications to ensure they were qualified to perform the inspections of the steam generator tubes.

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 Electric Power Research Institute examination technique specification sheets to verify that the essential variables regarding flaw sizing accuracy, tubing, equipment, technique, and analysis had been identified and qualified through demonstration.

The inspection procedure specified comparing the estimated size and number of tube flaws detected during the current outage against the previous outage operational assessment predictions to assess the licensee's prediction capability. The number of

identified indications fell within the range of prediction and was quite consistent with predictions from the vendor for the previous outage. The tubes were plugged due to wear, which was expected, and no new damage mechanisms were identified during this inspection. The number of tubes plugged for both steam generators were significantly fewer than estimated prior to the outage.

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

The inspection scope for this outage (U3R14) included:

- 1) 100 percent bobbin in both generators from tube end to tube end
- 2) Plus point probe inspection of all U-bends in the first four rows of tubes, counting from the divider lane
- 3) A secondary side visual inspection of the divider lane that revealed two small pieces of wire, one of which was retrieved and one of which was left in place after an engineering analysis was performed to ensure it would not migrate or cause tube wear during the next cycle

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

b. Findings

No findings of significance were identified.

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

a. Inspection scope

The inspection procedure requires review of a sample of problems associated with inservice inspections documented by the licensee in the corrective action program for appropriateness of the corrective actions.

The inspectors reviewed 36 condition reports which dealt with inservice inspection activities and found the corrective actions were appropriate. The specific condition reports reviewed are listed in the documents reviewed section. From this review the inspectors concluded that the licensee has an appropriate threshold for entering issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying industry operating experience.

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

These activities constitute completion of one sample as defined by IP 71111.08-05.

b. Findings

No findings of significance were identified.

**1R11 Licensed Operator Requalification Program (71111.11)**

a. Inspection Scope

Quarterly Inspection

On June 4, 2009, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings of significance were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

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

- May 1, 2009, Unit 2, main steam isolation Valve 2JSGEUV0180 accumulator Train B erratic pressure indication
- May 7, 2009, Unit 1, low pressure safety injection Train A recirculation Valve 1JSIAUV0669 failure to fully open

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

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

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

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

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

Risk Assessment and Management of Risk

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and

safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- April 30, 2009, Unit 1, low pressure safety injection Train A out of service due to emergent maintenance on recirculation Valve 1JSIAUV0669
- May 1, 2009, Unit 2, main steam isolation Valve 2JSGEUV0180 accumulator Train B out of service due to planned maintenance for erratic pressure indication
- May 9-15, 2009, Unit 3, emergency diesel generator Train A out of service due to planned maintenance on the voltage regulator

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

b. Findings

No findings of significance were identified.

**1R15 Operability Evaluations (71111.15)**

a. Inspection Scope

The inspectors reviewed the following issues:

- April 3, 2009, Unit 3, operability determination for ultrasonic measurement of high pressure safety injection miniflow line degradation due to cavitation
- April 13–24, 2009, Unit 1, operability determination for atmospheric dump valve back up nitrogen supply rupture disc adequacy and setpoint
- April 20, 2009, Unit 1, operability determination for essential cooling water heat exchanger Train B for thermal performance calculation using incorrect initial temperature assumption

- April 20, 2009, Units 1, 2, and 3, operability determination for low pressure safety injection and containment spray operation during full flow recirculation through the radioactive water storage tank
- April 24, 2009, Unit 2, evaluation for installed scaffolding exceeding 90 days without engineering approval
- April 28, 2009, Units 1, 2, and 3, operability determination for feedwater isolation valve nitrogen supply affecting nonessential auxiliary feedwater flow path
- April 28, 2009, Unit 2, operability determination for essential cooling water Train A heat exchanger tube leak

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 Updated Final Safety Analysis Report to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of seven operability evaluation inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

Introduction. The inspectors identified a noncited Severity Level IV violation of 10 CFR 50.59 for the failure of engineering personnel to perform adequate written safety evaluations prior to implementing changes to the emergency core cooling system. As a result, engineering personnel failed to obtain prior NRC approval for a change that involved two unreviewed safety questions involving emergency core cooling system operability and containment bypass leakage during an accident.

Description. On October 30, 2007, engineering personnel wrote Palo Verde Action Request 3085457, which identified concerns with Procedure 40OP-9CH12, "Refueling Water Tank Operation," Revision 27, which allows the plant to be placed in a configuration outside of the design basis. The system alignment in Procedure 40OP-9CH12 allowed potential deadheading and flow limiting conditions for some of the safety injection system pumps, rendering both trains of the safety injection system inoperable. Procedure 40OP-9CH12 also allowed a potential containment bypass following a recirculation actuation signal, which would adversely affect dose projections following a loss of coolant accident.

Since 1987, the licensee had utilized operating and test procedures to provide for full flow recirculation of the borated water within the refueling water tank by the safety injection pumps taking suction from the bottom of the refueling water tank, and discharging through the normally isolated return line to the top of the refueling water tank. This full flow line-up was used during normal power operations to mix boron in the refueling water tank, to control temperature in the refueling water tank, and for inservice testing and maintenance.

During the NRC Problem Identification and Resolution inspection in February 2009, the inspectors identified that 97 Palo Verde Action Requests written during the component design basis review either needed an immediate operability determination or a functional assessment or the immediate operability determination/functional assessment needed more information to provide a reasonable assurance of operability, as described in inspection report Finding 05000528;529;530/2009006-06, "Failure to Thoroughly Evaluate Conditions Adverse Quality for Potential Operability Impacts." As part of the extent of condition review for the inspector's concern, operations personnel reviewed Palo Verde Action Request 3085457 which described a refueling water tank full flow recirculation issue, and asked for an evaluation of the issue for the high pressure safety injection pumps, the low pressure safety injection pumps, and the containment spray pumps. This full flow configuration could result in inadequate flow through some or all of the safety injection pumps when these pumps are operating on their mini-flow recirculation path. All of the safety injection pumps share a common return line to the refueling water tank, so the higher flow rates of the high capacity safety injection pumps increase the backpressure for pumps operating on mini-flow recirculation. This could result in deadheading or limiting flow for these pumps, and result in overheating and cavitation. This potentially impacts the safety injection pumps ability to perform their safety function during a design basis accident condition, such as a safety injection actuation signal. The Palo Verde Action Request only assessed operability for the high pressure safety injection pumps, and not for the low pressure safety injection pumps and containment spray pumps.

Also, the safety injection system full flow configuration used several manual and normally locked closed isolation valves. These valves do not have an automatic closure during a design basis accident when a recirculation actuation signal is received. Having these valves open during an accident created a containment bypass flow path for radioactive water from the containment sump to be transferred to the refueling water tank. This could challenge the 10 CFR Part 100 limits for radioactive release to the atmosphere.

The licensee took immediate actions to stop use of procedures that used full flow recirculation including Procedure 40OP-9CH12, "Refueling Water Tank Operations," Revision 30, Procedure 73ST-9SI06, "Containment Spray Pump and Check Valves – Inservice Test," Revision 28, Procedure 73ST-9SI11, "Low Pressure Safety Injection Pumps Miniflow – Inservice Test," Revision 23, Procedure 73ST-xXI11, "Safety Injection Train A Emergency Core Cooling System Throttle Valves – Inservice Test," Revision 22, and Procedure 73ST-xXI12, "Safety Injection Train B Emergency Core Cooling System Throttle Valves – Inservice Test," Revision 23, by placing them on administrative hold, and red tagged closed each of the full flow recirculation path manual valves (Note: X is the applicable unit number). The inspectors opened Unresolved Item 05000528;529;530/2009006-09, "Safety Injection Pump Full Flow Recirculation Potential Design Control Issue," to determine if a design control (or other) performance

deficiency exists and to determine the significance of any identified performance deficiencies for the full flow recirculation issue.

The engineering personnel performed a root cause evaluation in Condition Report / Disposition Report 3287805. Engineering personnel determined that the full flow recirculation line-up, using either low pressure safety injection or containment spray, could potentially impact one or more safety injection pumps mini-flow rates because of the resulting increased pressure in the mini-flow lines. The licensee's evaluation determined the following:

- Use of a low pressure safety injection pump at flow rates greater than 2500 gallons per minute would reduce the opposite train low pressure safety injection mini-flow recirculation below minimum required
- Use of a low pressure safety injection pump at flow rates greater than 3200 gallons per minute would reduce mini-flow recirculation of both containment spray trains below the minimum required
- Use of a containment spray pump at flow rates greater than 2450 gallons per minute would reduce mini-flow recirculation of the same train low pressure safety injection pump below the minimum required
- Use of a containment spray pump at flow rates greater than 2600 gallons per minute would reduce mini-flow recirculation of the opposite train low pressure safety injection pump below the minimum required
- Use of a containment spray pump at flow rates greater than 3150 gallons per minute would reduce mini-flow recirculation of the opposite train containment spray pump below the minimum requirement

Engineering personnel determined that if normal safety injection system alignment was not restored prior to a recirculation actuation signal, the containment spray and low pressure safety injection full flow recirculation alignment could result in a containment bypass flow path to the refueling water tank. This bypass flow could also affect the safety injection pump available net positive suction head because the containment sump levels would decrease.

Risk personnel determined that the full flow recirculation alignments could have prevented the fulfillment of the safety functions of the safety injection system to remove residual heat and mitigate the consequences of an accident. Also, the alignments could have resulted in the loss of a safety function to control the release of radioactive material as a result of the containment bypass path. The core damage frequency and large early release frequency were analyzed for the durations the low pressure safety injection pump and the containment spray pump were in the full flow recirculation alignment from September 2007 through February 2009, which was representative of prior periods of operation. Due to the small exposure durations that low pressure safety injection and containment spray were used for full flow recirculation, the analysis concluded that the risk to the units had a very low safety significance.

The inspectors questioned why an adequate written safety evaluation was not performed prior to implementing the changes to the safety injection system. A 10 CFR 50.59

review was conducted on June 20, 1987, for Procedure 4XP-XCH05, "Refueling Water Tank Makeup," Revision 5, and a 10 CFR 50.59 review was conducted on September 21, 1990, for Procedure 4XOP-XCH12, "Refueling Water Tank Operations," Revision 0, which superseded Procedure 4XP-XCH05. These procedures implemented the initial guidance for refueling water tank full flow line-ups at power. Both 10 CFR 50.59 screenings included a review of the applicable sections of the Updated Final Safety Analysis Report; however, the reviews failed to recognize that operation of the refueling water tank full flow recirculation path at power placed the plant outside of its design configuration. Each of the 10 CFR 50.59 reviews determined that no 10 CFR 50.59 evaluation was required.

This finding closes Unresolved Item 05000528;529;530/2009006-09, "Safety Injection Pump Full Flow Recirculation Potential Design Control Issue."

Analysis. The performance deficiency associated with this finding is the failure of engineering personnel to perform adequate written safety evaluations prior to implementing changes to the emergency core cooling system. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. This finding is also more than minor because it is associated with the configuration control attribute of the Barrier Integrity Cornerstone and adversely affects the cornerstone objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. In accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Disposition Screening," the inspectors determined that traditional enforcement applied because this issue may have impacted the NRC's ability to perform its regulatory function, and should be evaluated using the traditional enforcement process. The issue was classified as Severity Level IV because the violation of 10 CFR 50.59 involved conditions evaluated as having very low safety significance by the significance determination process. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding required a Phase 2 analysis because the finding represented a loss of safety system function of the safety injection system. The Phase 2 analysis determined that this finding was potentially greater than Green; therefore, a Phase 3 analysis was completed by a regional senior reactor analyst. The Phase 3 analysis determined that this issue was of very low safety significance based on the senior reactor analyst reviewing the licensee's risk estimate of the condition which concluded that the incremental conditional core damage probability was much less than 1.0E-7. The analyst checked portions of the licensee's analysis using the Palo Verde SPAR model, and found the licensee results to be acceptable. Therefore, the significance of the finding was determined to be very low (Green). This finding was evaluated as not having a crosscutting aspect because the performance deficiency is not indicative of current performance.

Enforcement. This issue involved the failure of engineering personnel to adequately evaluate and control changes to the facility prior to March 2001; therefore, the issue was evaluated against the 10 CFR 50.59 requirements that were in effect in 1992. Title 10 of the Code of Federal Regulations 50.59(a)(1) states that the holder of a license authorizing operation of a production or utilization facility may: (1) make changes in the facility as described in the safety analysis report, (2) make changes in the procedures as described in the safety analysis report, and (3) conduct tests or experiments not

described in the safety analysis report, without prior Commission approval, unless the proposed change, test, or experiment involves a change in the technical specifications incorporated in the license or an unreviewed safety question. A proposed change, test, or experiment shall be deemed to involve an unreviewed safety question: (1) if the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report may be increased; (2) if a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created; or (3) if the margin of safety as defined in the basis for any technical specification is reduced. The full flow recirculation alignment created the possibility for a malfunction of a different type than any evaluated previously in the Updated Final Safety Analysis Report, Chapter 15, "Accident Analyses," Revision 13. Contrary to the above, between 1987 and February 2009, engineering personnel failed to perform adequate written safety evaluations prior to implementing changes to the emergency core cooling system. This deficiency resulted in the failure to obtain prior NRC approval for a change that involved two unreviewed safety questions that adversely affected the emergency core cooling system function and unexpected containment bypass leakage during an accident.

This finding was also evaluated against the current 10 CFR 50.59 requirement, which states that a licensee shall obtain a license amendment pursuant to 10 CFR 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component important to safety previously evaluated in the Updated Final Safety Analysis Report. Contrary to above, engineering personnel implemented changes to Procedure 4XOP-XCH05, "Refueling Water Tank Makeup," Revision 5, and Procedure 4XOP-XCH12, "Refueling Water Tank Operations," Revision 0, which more than minimally increased the likelihood of occurrence of a malfunction of the safety injection system. This is a violation of 10 CFR 50.59 requirements and is being treated as a Severity Level IV violation. Because this finding is of very low safety significance and has been entered into the corrective action program as Condition Report / Disposition Report 3287805, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the Enforcement Policy: NCV 05000528;529;530/2009003-03, "Failure to Perform Written Safety Evaluation in Accordance with 10 CFR 50.59 for Refueling Water Tank Full Flow Recirculation."

## **1R18 Plant Modifications (71111.18)**

### **a. Inspection Scope**

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

- April 5-30, 2009, Unit 3, installation of the plant cooling water temporary modification during the Unit 3 refueling outage
- May 15, 2009, Unit 3, installation main steam line hanger permanent modification as a corrective action to reduce main steam line vibrations

### Temporary Modifications

The inspectors reviewed the temporary modification and the associated safety evaluation screening against the system design bases documentation, including the Updated Final Safety Analysis Report 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.

### Permanent Modifications

The inspectors reviewed key affected parameters associated with energy needs, materials/replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flow paths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the modification listed above. The inspectors verified that modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; post-modification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur, systems, structures and components' performance characteristics still meet the design basis, the appropriateness of modification design assumptions, and the modification test acceptance criteria will be met; and licensee personnel identified and implemented appropriate corrective actions associated with permanent plant modifications. Specific documents reviewed during this inspection are listed in the attachment.

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

#### b. Findings

No findings of significance were identified.

### **1R19 Postmaintenance Testing (71111.19)**

#### a. Inspection Scope

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

- April 2, 2009, Unit 2, emergency diesel generator Train A following corrective maintenance of fuel oil transfer pump conduit and motor termination box
- April 22, 2009, Unit 3, spray pond pump Train B following corrective maintenance of the impeller

- April 23, 2009, Unit 2, emergency diesel generator Train B fuel oil transfer pump following corrective maintenance of the pump motor termination box
- May 3, 2009, Unit 1, low pressure safety injection Valve 1JSIAUV0669 following corrective maintenance on motor operator
- May 3-15, 2009, Unit 3, containment spray Train B injection header isolation valve following corrective maintenance of degraded valve internals

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 Updated Final Safety Analysis Report, 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 of significance were identified.

**1R20 Refueling and Other Outage Activities (71111.20)**

a. Inspection Scope

**Unit 3 Refueling Outage 3R15**

The inspectors reviewed the outage safety plan and contingency plans for the Unit 3 refueling outage, conducted between April 4 and May 28, 2009, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense-in-depth, is commensurate with the outage safety plan for key safety functions and

compliance with the applicable technical specifications when taking equipment out of service

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

The inspectors incorporated NRC Operating Experience Smart Sample FY2007-03, Revision 2, "Crane and heavy lift inspection, supplemental guidance for IP 71111.20," into the inspections. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

Introduction. A Green self-revealing noncited violation of Technical Specification 5.4.1(a), "Procedures," was identified for the failure of operations personnel to follow procedural requirements during a planned plant startup. Specifically, operations personnel did not take action to lower turbine load after synchronizing the

generator to the offsite electrical distribution grid during cooldown causing a pressurizer low level alarm and a loss of pressurizer heaters.

Description. On May 27, 2009, at 1:19 p.m., Unit 3 operations personnel heated up the reactor and entered Mode 1 (>5% reactor power) following completion of refueling outage activities. Operations personnel then slowly increased power to 12 percent, monitoring various plant parameters. Once power reached 12 percent, operators synchronized the turbine generator to the offsite electric distribution grid. Operations personnel monitored reactor coolant temperature, reactor power, steam demand on the main steam system and steam generator water levels as required to ensure proper equipment operation and stability between the reactor coolant system and main steam system. Power operations at that time were governed by several procedures, including Procedure 40OP-9MB01, "Main Generation and Excitation," Revision 45, Procedure 40OP-9MT02, "Main Turbine," Revision 64, and Procedure 40OP-9ZZ04, "Plant Startup Mode 2 to Mode 1," Revision 56.

On May 27, 2009, at 5:55 p.m., the licensee synchronized the main generator to the grid at approximately 90 megawatts. Reactor coolant system temperature was observed to be lowering, so the control room supervisor provided direction to lower turbine load (to about 60 megawatts) which resulted in the reactor coolant system temperature rising. At approximately 6:00 p.m., operators raised generator power to about 80 megawatts, stopping the temperature rise. Shift change and turnover begins at approximately 6:00 p.m. every day, so the shift manager instructed the control room supervisor to maintain the reactor coolant system in a stable condition while shift turnover was in process. The off-going shift manager and the on-coming shift manager went to the shift manager's office to discuss plant status for turnover. The on-shift control room supervisor knew that the next major step was to get the main generator to 110 megawatts, and remain at that power level for approximately four hours as required by Procedure 40OP-9MT02. The control room supervisor observed the reactor coolant system plant parameters, noted that they were within required specifications, and informed the turbine control operator to raise main generator load by 10 megawatts to 90 megawatts. The turbine control operator observed reactor coolant system plant parameters and noted that they were within required specifications, and raised main generator load by 10 megawatts. This caused a plant transient that resulted in an excessive reactor coolant system cooldown, a pressurizer low level alarm, and caused all the safety-related pressurizer heater banks to trip and turn off. As a result of pressurizer level falling below the Technical Specification 3.4.9, "Pressurizer," Limiting Condition of Operation, operations personnel entered the technical specification required action statement that required the unit to be in Mode 3 within six hours. Upon identification of the low pressurizer level alarm and trip of the safety-related pressurizer heaters, the operating crew re-energized the pressurizer heaters to regain pressurizer pressure control, stabilized the plant by decreasing turbine generator load, and then exited the limiting condition for operation.

The inspectors reviewed Procedure 40OP-9MB01, "Main Generation and Excitation," Revision 45, Section 4.3, "Instructions," which stated, in part, that if a reactor coolant system cooldown occurs, then decrease load on the generator to stabilize reactor coolant system temperature. The inspectors reviewed the plant data from the process plant computer for this event, and determined that while the operators in the control room observed reactor coolant system plant parameters within required specifications, the reactor coolant system was actually cooling down. The inspectors noted that by

raising turbine generator load, the operations personnel caused the reactor coolant system to cooldown at a greater rate than it was already. After reviewing the procedures that were in use for this evolution, the inspectors concluded that the procedures provided adequate guidance for actions to take in the event of a reactor coolant system cooldown after synchronized turbine generator; however, operations personnel failed to adequately implement them.

Analysis. The performance deficiency associated with this finding is the failure of operations personnel to follow procedures during a planned plant startup. The finding is more than minor because it is associated with the human performance attribute of the Initiating Events Cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and power operations. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance because the finding did not result in exceeding the technical specification limit for identified reactor coolant system leakage, did not affect other mitigation systems, did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available; and did not increase the likelihood of a fire or internal/external flood. This finding has a crosscutting aspect in the area of human performance associated with decision making because operations personnel failed to properly implement their roles in communicating between applicable operational personnel [H.1(a)].

Enforcement. Technical Specification 5.4.1(a), "Procedures," requires that procedures be established, implemented, and maintained covering the applicable procedures in Regulatory Guide 1.33, Appendix A. Paragraph 2.e of Regulatory Guide 1.33, Appendix A, requires procedures be maintained and implemented for the turbine startup and synchronization of the turbine generator. Procedure 40OP-9MB01, "Main Generation and Excitation," Revision 45, Section 4.3, "Instructions," stated, in part, that if a reactor coolant system cooldown occurs, then decrease load on the generator to stabilize reactor coolant system temperature. Contrary to the above, on May 27, 2009, operations personnel did not stabilize reactor coolant system temperature by decreasing load on the main generator during a reactor coolant system cooldown. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as Palo Verde Action Request 3336555, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 5000530/2009003-04, "Inadvertent Decrease of Pressurizer Level Due to Personnel Error."

## **1R22 Surveillance Testing (71111.22)**

### **a. Inspection Scope**

The inspectors reviewed the Updated Final Safety Analysis Report, procedure requirements, and technical specifications to ensure that the four 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 American Society of Mechanical Engineers 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 13, 2009, Unit 1, control element assembly operability check
- April 15, 2009, Unit 3, inservice test of low pressure safety injection and containment spray suction and refueling water tank outlet check valves
- April 24, 2009, Unit 1, inservice test of high pressure safety Train B injection valves
- April 27, 2009, Unit 1, auxiliary feedwater Train A, inservice test
- April 29, 2009, Unit 2, emergency diesel generator Train A surveillance test
- May 7, 2009, Unit 1, low pressure safety injection pump Train A miniflow inservice test

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

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

b. Findings

No findings of significance were identified.

**1EP6 Drill Evaluation (71114.06)**

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency planning training evolutions on June 4, 2009, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the control room (simulator) and the technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational and Public Radiation Safety**

**2OS1 Access Control to Radiologically Significant Areas (71121.01)**

a. Inspection Scope

This area was inspected to assess licensee personnel's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls. The inspector used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspector interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspector performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation packages reported by the licensee in the Occupational Radiation Safety Cornerstone
- Controls (surveys, posting, and barricades) of three radiation, high radiation, or airborne radioactivity areas
- Radiation exposure permits procedures, engineering controls, and air sampler locations

- Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarm
- Barrier integrity and performance of engineering controls in two airborne radioactivity areas
- Physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools
- Self-assessments, audits, licensee event reports, and special reports related to the access control program since the last inspection
- Corrective action documents related to access controls
- Licensee actions in cases of repetitive deficiencies or significant individual deficiencies
- Radiation exposure permit briefings and worker instructions
- Adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination control during job performance
- Dosimetry placement in high radiation work areas with significant dose rate gradients
- Changes in licensee procedural controls of high dose rate - high radiation areas and very high radiation areas
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas

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

These activities constitute completion of 18 of the required 21 samples as defined in Inspection Procedure 71121.01-05.

b. Findings

No findings of significance were identified.

**2OS2 ALARA Planning and Controls (71121.02)**

a. Inspection Scope

The inspectors assessed licensee personnel's performance with respect to maintaining individual and collective radiation exposures as low as is reasonably achievable. The

inspectors used the requirements in 10 CFR Part 20 and the licensee's procedures required by technical specifications as criteria for determining compliance. The inspectors interviewed licensee personnel and reviewed the following:

- Current 3-year rolling average collective exposure
- Five outage work activities scheduled during the inspection period and associated work activity exposure estimates which were likely to result in the highest personnel collective exposures
- Workers' use of the low dose waiting areas
- Exposures of individuals from selected work groups
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Source-term control strategy or justifications for not pursuing such exposure reduction initiatives
- Specific sources identified by the licensee for exposure reduction actions, priorities established for these actions, and results achieved since the last refueling cycle
- Declared pregnant workers during the current assessment period, monitoring controls, and the exposure results

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

The inspector completed four of the required 15 samples and four of the optional samples as defined in IP 71121.02-05.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

**4OA1 Performance Indicator Verification (71151)**

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the first quarter 2009 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

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

b. Findings

No findings of significance were identified.

.2 Safety System Functional Failures

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 2008 through the first quarter 2009. 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 5, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance were used. 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 2008 through the first quarter 2009 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 are described in the attachment to this report.

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

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - Emergency ac Power System

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 2008 through the first quarter 2009. 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 5, 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 2008 through the first quarter 2009 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable 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 are described in the attachment to this report.

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 of significance were identified.

.4 Mitigating Systems Performance Index - High Pressure Injection Systems

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 2008 through the first quarter 2009. 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 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports and NRC integrated inspection reports for the period from the second quarter 2008 through the first quarter 2009 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable 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 are described in the attachment to this report.

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 of significance were identified.

.5 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences performance indicator for the first quarter 2009. 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 5, was used. The inspectors reviewed the licensee's assessment of the performance indicator for occupational radiation safety to determine if indicator-related data was adequately assessed and reported. To assess the adequacy of the licensee's performance indicator

data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review, and the results of those reviews. The inspectors independently reviewed electronic dosimetry dose rate and accumulated dose alarm and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

These activities constitute completion of the occupational radiological occurrences sample as defined by Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences performance indicator for the first quarter 2009. 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 5, was used. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose.

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

b. Findings

No findings of significance were identified.

**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 of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings of significance were identified.

.3 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 six month period of January 1 through June 30, 2009, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance

audit/surveillance reports, self-assessment reports, and maintenance rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

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

b. Findings

No findings of significance were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

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

- Condition Report / Disposition Report 332797, Damage to reactor vessel head flange due to robot arm falling into reactor vessel
- Condition Report / Disposition Report 3314991, Valve 3-SI-UV-672 failure to fully open

Documents reviewed by the inspectors 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

No findings of significance were identified.

**40A3 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) provide input in determining the appropriate agency response in accordance with Management Directive 8.3, "NRC Incident Investigation Program;" (2) evaluate licensee actions; and (3) confirm that the licensee properly classified the event in accordance with

emergency action level procedures and made timely notifications to NRC and state/governments, as required.

- May 14, 2009, Loss of special nuclear material event Notification 45068

Documents reviewed by the inspectors are listed in the attachment.

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

b. Findings

No findings of significance were identified.

.2 Event Report Reviews

a. Inspection Scope

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

b. Findings and Observations

(Closed) Licensee Event Report 05000528;05000529;05000530/2009-001-00, Safety Injection System Recirculation Alignment Results in Unanalyzed Condition

On February 18, 2009, it was discovered that certain pump and valve alignments of the safety injection system, used for periodic surveillance testing and recirculation of the refuelling water tank, could under certain accident scenarios, reduce both trains of safety injection pump minimum recirculation capability and affect the operability of the safety injection pumps. These alignments could have also resulted in the bypass of containment sump water to the refuelling water tank and adversely impact the function of safety injection pumps after a recirculation actuation signal. The root causes were determined to be inadequate review and approval of procedure changes, an inadequate review of operating experience, and an inadequate 10 CFR 50.59 review. The inspectors reviewed the licensee's corrective actions and documented their results in Section 1R15. The inspectors reviewed this License Event Report and no additional violation of NRC requirements occurred. This Licensee Event Report is closed.

**40A5 Other Activities**

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

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

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

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

Portions of Temporary Instruction 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds," were performed at Palo Verde Nuclear Generating Station Unit Refueling Outage U3R14. Specific documents reviewed during this inspection are listed in the attachment. This unit has the following dissimilar metal butt welds:

- Two 12-inch pressurizer surge line nozzles, one each on the pressurizer and hot leg sides. Both were mitigated during previous outages using a weld overlay process and both were categorized as F following the weld overlay process.
- Four 8-inch pressurizer safety nozzles, all mitigated during previous outages using a weld overlay process, volumetric Category F weld.
- Two 16-inch shutdown cooling nozzles, both of which were mitigated using a weld overlay process during the current outage and classified as Category F after the weld overlay.
- Four 14-inch safety injection nozzles all classified as Category E. The decision as to whether or not mitigation should be performed has not yet been made.
- One 4-inch pressurizer spray nozzle and two 3-inch pressurizer spray nozzles. The two 3-inch nozzles are categorized as Category K. The 3-inch nozzle was mitigated using a weld overlay process during a previous outage and is Category F.
- Three 2-inch drain line nozzles, each classified as Category K.
- Two additional 2-inch line nozzles, one for letdown and one for charging, each classified as Category K.

Licensee's Implementation of the MRP-139 Baseline Inspections

1. MRP-139 baseline inspections:

The inspectors observed performance and reviewed records of structural weld overlays and nondestructive examination activities associated with the licensee's pressurizer and hot leg structural weld overlay mitigation effort. The baseline inspections of the pressurizer dissimilar metal butt welds were completed prior to the December 2007 deadline.

2. At the present time, the licensee is not planning to take any deviations from the baseline inspection requirements of MRP-139, and all other applicable dissimilar metal butt welds are scheduled in accordance with MRP-139 guidelines.

#### Volumetric Examinations

1. The inspectors reviewed the ultrasonic examination records of the mitigated pressurizer surge line and one safety valve. The inspectors concluded that the ultrasonic examination for these welds was done in accordance with American Society of Mechanical Engineers Code, Section XI, Supplement VIII Performance Demonstration Initiative requirements regarding personnel, procedures, and equipment qualifications. No relevant conditions were identified during these examinations.
2. The Inspectors observed the nondestructive evaluations performed on the two shutdown cooling line nozzles. Inspection coverage met the requirements of MRP-139 and no relevant conditions were identified.
3. The certification records of examination personnel were reviewed for those personnel that performed the examinations of the mitigated nozzles. All personnel records showed that they were qualified under the Electric Power Research Institute Performance Demonstration Initiative.
4. No deficiencies were identified during the nondestructive evaluations.

#### Weld Overlays

1. The inspectors observed welding activities associated with full structural weld overlays on two shutdown cooling nozzles on the hot legs. The inspectors verified, by review, that the welding procedure specifications and the welders had been properly qualified in accordance with American Society of Mechanical Engineers 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.
2. The licensee submitted and received NRC authorization by letter dated June 21, 2007, for the use of 10 CFR 50.55a, Relief Request 36. This relief request is applicable to preemptive full structural weld overlays of dissimilar metal welds on pressurizer spray, safety, and surge nozzles-to-safe-ends and hot-leg shutdown cooling and surge nozzles-to-safe-ends and their adjoining welds. The shutdown cooling nozzle welds were mitigated during this outage (3R14) and the pressurizer dissimilar metal butt welds were mitigated during the last outage (3R13) using the full structural weld overlay process.
3. Deficiencies have not been identified in the completed full structural weld overlays.

#### Mechanical Stress Improvement

This item is not applicable because the licensee did not employ a mechanical stress improvement process.

### Inservice Inspection Program

The licensee's MRP-139 program is part of their Alloy 600 program and future inspections of the various dissimilar metal butt welds are in accordance with the MRP-139 requirements.

b. Findings

No findings of significance were identified.

.3 Willful Failure to Complete Fire Watch Tours and Falsification of Fire Watch Logs

a. Inspection Scope

The NRC conducted an investigation into the details of incomplete fire watch tours and falsified fire watch records on September 1, 2008. The NRC conducted interviews with the individuals in question as well as the security operations department leader. The inspectors also reviewed the results of the licensee's investigation, extent of condition review, and corrective actions. Fire watch logs, badge access transaction reports, and fire watch training records were reviewed in the regional office between March 9 and June 24, 2009.

b. Findings

.1 Failure by a Security Officer to Conduct Required Hourly Fire Watch Tours Due to Careless Disregard

Introduction. The inspectors identified a noncited Severity Level IV violation of License Condition 2.C.(7) when a security officer willfully failed to complete fire watch tours on September 1, 2008. The inspectors concluded that the officer failed to complete the required fire watch tours due to a careless disregard for the regulations on the part of the individual.

Description. On September 4, 2008, the licensee began an investigation into potentially inappropriate conduct involving two security officers on September 1, 2008. During the investigation, the licensee determined that an additional security officer was present in the secondary alarm station for a prolonged period of time between 11 a.m. and 12 p.m., although his roving patrol assignments required fire watch tours in the control and auxiliary buildings during this time.

During the licensee's investigation, the officer initially denied missing any fire watches, but ultimately admitted, when confronted with the evidence, that he missed one fire watch tour between 11 a.m. and 12 p.m., and failed to adequately perform a separate fire watch tour between 2 p.m. and 3 p.m., on September 1, 2008. The officer also admitted signing the fire watch logs indicating the tours were completed as required.

The licensee promptly notified the NRC Senior Resident Inspector on September 4, 2008. The officer was placed on administrative leave and ultimately resigned.

The licensee took the following actions in response to this issue:

- The licensee interviewed the security officer, removed his plant access, and placed the security officer on administrative leave.
- The licensee conducted an extent of condition review by conducting an audit of fire watch tours by the individual, but identified no other discrepancies.

The licensee had previously completed an audit of fire watch tours in May 2008. The audit reviewed 103 fire watch tours between November 1, 2007 and March 9, 2008. The results of the audit indicate that all of the sampled fire watch tours were properly completed.

During an interview with the NRC, the officer admitted being aware that failure to perform a fire watch was a violation of requirements. The officer testified that he had routinely performed fire watch tours and his training was not an issue. The officer's training records indicated satisfactory completion of the required fire watch training.

Based on Office of Investigations Report 4-2008-071 and inspection activities, the NRC concluded that the individual failed to complete the required fire watch tours due to a careless disregard for the regulations on the part of the individual and then deliberately falsified the fire watch logs.

Analysis. The performance deficiency associated with this finding is the failure of a security officer to conduct two required hourly fire watch tours. This issue was dispositioned using traditional enforcement due to the willful aspects of the performance deficiency. In accordance with Section IV.A.4 of the Enforcement Policy, this issue was considered more than minor due to the willful aspects of the performance deficiency. In accordance with the guidance in Supplement I of the Enforcement Policy, this issue was considered a Severity Level IV violation. There were no crosscutting aspects associated with this performance deficiency.

Enforcement. Arizona Public Service Company Operating License NPF 41, 51 and 74, License Condition 2.C.(7), "Fire Protection Program," requires that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility, as supplemented and amended, and as approved in the Safety Evaluation Report through Supplement 11. The Updated Final Safety Analysis Report, Section 9.5.1.5, "PVNGS Fire Protection Program," states that the fire protection program contains a fire watch program. Section 9.5.1.5.3, "Fire Protection Administrative Controls," further states that procedures to provide fire watches will be provided to maintain the performance of the fire protection systems and personnel. Procedure 14DP-0FP34, "Firewatch Duties," Revision 12, was one of the procedures that implements the approved fire protection program and contained the instructions for performing fire watch duties. This procedure noted the purpose of the roving fire watch was to check specific areas in the plant where fire suppression/detection systems or fire barriers were impaired. Contrary to the above, on September 1, 2008, the licensee failed to implement and maintain in effect some provisions of the approved fire protection program. Specifically, a security officer failed to perform a required fire watch tour between 11 a.m. and 12 p.m., and failed to adequately perform a separate fire watch tour between 2 p.m. and 3 p.m. the same day. Although this violation was willful, it was identified by the licensee, it involved isolated acts of a low-level individual, and it was addressed by appropriate remedial action. This issue was entered into the licensee's corrective action program as Palo Verde Action

Request 3219290. Therefore, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 5000528/2009003-05 (EA-2009-050), "Failure by a Security Officer to Conduct Required Hourly Fire Watch Tours Due to Careless Disregard."

.2 Deliberate Falsification of Fire Watch Logs by a Security Officer

Introduction. The inspectors identified a noncited Severity Level IV violation of 10 CFR 50.9 requirements when a security officer deliberately falsified fire watch logs. Specifically, on September 1, 2008, the officer failed to perform two fire watch tours and then signed the fire watch logs indicating that the tours were completed as required.

Description. This issue is described above in Section 4OA5.3.b.1. As part of that review, an additional violation was identified when a security officer falsified fire watch logs. Based on Office of Investigations Report 4-2008-071 and inspection activities, the NRC concluded that the individual failed to complete the required fire watch tours due to a careless disregard for the regulations on the part of the individual and then deliberately falsified the fire watch logs.

Analysis. The performance deficiency associated with this finding is the failure of a security officer to provide complete and accurate information on the fire watch log. This issue was dispositioned using traditional enforcement due to the willful aspects of the performance deficiency. Furthermore, the failure to provide complete and accurate information has the potential to impact the NRC's ability to perform its regulatory function. In accordance with Section IV.A.4 of the Enforcement Policy, this issue was considered more than minor due to the willful aspects of the performance deficiency. In accordance with the guidance in Supplement I of the Enforcement Policy, this issue was considered a Severity Level IV violation. There were no crosscutting aspects associated with this performance deficiency.

Enforcement. Title 10 of the Code of Federal Regulations, Section 50.9 requires, in part, that information required by regulation or license condition to be maintained by the licensee shall be complete and accurate in all material respects. Arizona Public Service Company Operating License NPF 41, 51 and 74, License Condition 2.C.(7), "Fire Protection Program," requires that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility, as supplemented and amended, and as approved in the Safety Evaluation Report through Supplement 11. The Updated Final Safety Analysis Report, Section 9.5.1.5, "PVNGS Fire Protection Program," states that the fire protection program contains a fire watch program. Section 9.5.1.5.3, "Fire Protection Administrative Controls," further states that procedures to provide fire watches will be provided to maintain the performance of the fire protection systems and personnel. Procedure 14DP-0FP34, "Firewatch Duties," Revision 12, was one of the procedures that implemented the approved fire protection program and contained the instructions for performing fire watch duties. This procedure noted the purpose of the roving fire watch was to check specific areas in the plant where fire suppression/detection systems or fire barriers were impaired. The procedure required that roving fire watches shall record patrol times. Contrary to the above, on September 1, 2008, the licensee failed to maintain complete and accurate information in accordance with 10 CFR 50.9 and as required by License Condition 2.C.(7). Specifically, the licensee provided incomplete and inaccurate information on a fire watch log sheet when a security officer failed to

complete portions of the required fire watch tours and then falsified the fire watch log sheets to indicate that the fire watch tours had been completed. Although this violation was deliberate, it was identified by the licensee, it involved isolated acts of a low-level individual, and it was addressed by appropriate remedial action. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3219290. Therefore, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000528/2009003-06 (EA-2009-050), "Deliberate Falsification of a Fire Watch Log by a Security Officer."

#### **40A6 Meetings, Including Exit**

On April 17, 2009, the inspectors presented the results of the radiation safety inspection to Mr. R. Bement, Vice President, Nuclear Operations, and other members of his staff. The licensee acknowledged the issues presented.

On April 30, 2009, the inspectors presented the inservice inspection program inspection results to Mr. J. Hesser, Vice President of Engineering, and other members of the licensee staff. The licensee acknowledged the issues presented.

On June 24, 2009, the inspectors presented the results of missed fire watches to Mr. D. Mims, Vice President, Nuclear Regulatory Affairs and Performance Improvement, and other members of the licensee staff. The licensee acknowledged the issues presented.

On July 17, 2009, the inspectors conducted an exit to present the inspection results to Mr. R. Bement, Vice President, Nuclear Operations, and other members of the licensee's management staff. The licensee acknowledged the issues presented.

The inspectors noted that while proprietary information was reviewed, none would be included in this report.

#### **40A7 Licensee-Identified Violations**

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

- Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion III, "Design Control," states, "measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2 and as specified in the license application, for those structures, systems and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Engineering personnel identified that the replacement containment spray Valve 3SI-V-0672 required chamfering of the valve disk to ensure valve operation, but was not performed. The licensee determined the cause to be that the design change was identified in previous Startup Field Reports 3SI-105, 112 and 114 during plant construction, but these startup field reports were not incorporated into the valve design basis including the drawing. This event has been documented in the licensee's corrective action program as Condition Report / Disposition Request 3314991. The finding is of very low safety significance because it did not result in a loss of

safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to seismic, flooding, or severe weather initiating event.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

G. Andrews, Director, Performance Improvement  
J. Bayless, Senior Engineer  
S. Bauer, Department Leader, Regulatory Affairs  
R. Bement, Vice President, Nuclear Operations  
P. Borchert, Unit 1 Assistant Plant Manager  
R. Browning, Senior Engineer  
F. Burdick, Regulatory Affairs  
R. Burge, Senior Engineer  
R. Buzard, Section Leader, Compliance  
D. Carnes, Unit 2 Assistant Plant Manager  
K. Chavet, Senior Consultant, Regulatory Affairs  
L. Cortopossi, Plant Manager, Nuclear Operations  
D. Coxon, Unit Department Leader, Operations  
E. Dutton, Acting Director of Nuclear Assurance  
D. Elkington, Consultant, Regulatory Affairs  
E. Fernandez, Senior Engineer  
J. Gaffney, Director, Radiation Protection  
T. Gray, Department Leader, Radiological Support Services  
W. Grover Hettel, Director, Operations  
D. Hansen, Senior Consulting Engineer  
D. Hautala, Senior Engineer, Regulatory Affairs  
J. Hesser, Vice President, Engineering  
G. Hettel, Director, Operations  
M. Karbasian, Director, Design Engineering  
F. Lake, Performance Improvement  
R. Lane, Reactor Vessel ISI  
W. Leaverton, Steam Generator ISI  
J. McDonnell, Radiation Protection, Department Leader  
D. Mims, Vice President, Regulatory Affairs and Performance Improvement  
P. Paramithas, Department Lead, Modification Engineering  
F. Poteet, Senior Engineer  
T. Radtke, General Manager, Emergency Services and Support  
M. Ray, Director, Emergency Planning Programs  
H. Ridenour, Director, Maintenance  
R. Roehler, Regulatory Affairs, 50.59 Programs  
S. Sawtschenko, Department Leader, Emergency Preparedness  
M. Shea, Director, IMPACT  
J. Summy, Director, Plant Engineering  
J. Taylor, Unit Department Leader, Operations  
D. Vogt, Section Leader, Operations Shift Technical Advisor  
J. Waid, Director, Nuclear Training  
T. Weber, Section Leader, Regulatory Affairs

Nuclear Regulatory Commission

M. Runyan, Senior Reactor Analyst, Region IV

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened and Closed

05000528/2009003-01	NCV	Inoperable Fire Barrier Door for Emergency Diesel Generator Train B (Section 1R05)
05000528;529;530/2009003-02	NCV	Failure to Develop an Adequate Procedure to Ensure Operability of the Essential Cooling Water Heat Exchangers (Section 1R07)
05000528;529;530/2009003-03	NCV	Failure to Perform Written Safety Evaluation in Accordance with 10 CFR 50.59 for Refueling Water Tank Full Flow Recirculation (Section 1R15)
05000530/2009003-04	NCV	Inadvertent Decrease of Pressurizer Level Due to Personnel Error (Section 1R20)
05000528/2009003-05	NCV	Failure by a Security Officer to Conduct Required Hourly Fire Watch Tours Due to Careless Disregard (Section 4OA5.3.b.1)
05000528/2009003-06	NCV	Deliberate Falsification of a Fire Watch Log by a Security Officer (Section 4OA5.3.b.2)

Closed

05000528;529;530/2009006-09	URI	Safety Injection Pump Full Flow Recirculation Potential Design Control Issue (Section 1R15)
05000528;529;530/2009-001-00	LER	Safety Injection System Recirculation Alignment Results in Unanalyzed Condition (Section 4OA3)

**LIST OF DOCUMENTS REVIEWED**

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

**Section 1R04: Equipment Alignment**

PROCEDURES

Number	Title	Revision
40OP-9SI02	Recovery from Shutdown Cooling to Normal Operating Lineup	85

DRAWINGS

Number	Title	Revision
01-M-SIP-001	P&I Diagram Safety Injection & Shutdown Cooling System	42
01-M-SIP-002	P&I Diagram Safety Injection & Shutdown Cooling System	33
02-M-SIP-001	P&I Diagram Safety Injection & Shutdown Cooling System	38
02-M-SIP-002	P&I Diagram Safety Injection & Shutdown Cooling System	28
02-M-SIP-003	P&I Diagram Safety Injection & Shutdown Cooling System	9

MISCELLANEOUS

Document	Date/Revision
Shutdown Safety Function Assessment - Core Off-loaded, Refuel Pool isolated from Spent Fuel Pool	May 7, 2009
Palo Verde Nuclear Generating Station Design Basis Manual – SI System	Revision 29

**Section 1R05: Fire Protection**

PROCEDURES

Number	Title	Revision
14DP-0FP02	Fire System Impairments and Notifications	14
40OP-9SG02	Station Blackout Generator 1 Operation	1
40OP-9SG03	Station Blackout Generator 2 Operation	1
	Pre-Fire Strategies Manual	21

WORK ORDERS

3034922      3162525

PALO VERDE ACTION REQUESTS

3162017      3162009      3162019

FIRE SYSTEM COMPONENT CONDITION RECORDS

3229271      3315927

MISCELLANEOUS

Document	Revision
VTD-P115-00012, Peerless Pump Company Horizontal Centrifugal Pumps Instructions Installation Operation Maintenance	0
Updated Final Safety Analysis Report, Section 9.5	11

**Section 1R07: Heat Sink Performance**

PROCEDURES

Number	Title	Revision
74DP-9CY04	Systems Chemistry Specifications	61
73DP-9XI03	American Society of Mechanical Engineers Section XI Inservice Inspection	9

PALO VERDE ACTION REQUESTS

3319258      3033604

CONDITON REPORT / DISPOSITION REPORTS

3073996

WORK ORDERS

3020492

MISCELLANEOUS

Document	Date
Unit 2, Chemistry Control Instruction	April 27, 2009
Unit 2, Essential Cooling Water Chloride graph	August 2008 – May 2009
System Health Report	January 1 – June 30, 2008
Essential Cooling Water A Heat Exchanger Tube Leak Engineering Game Plan	May 1, 2009
Technical Requirements Manual 3.4.103, Structural Integrity	
Unit 2, Essential Cooling Water Heat Exchanger A Thermal Performance Test	November 29, 2006

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

### **PROCEDURES**

Number	Title	Revision
30DP-0WM12	Housekeeping	18
30DP-9MC01	Staging and Control of Maintenance Materials	16
30DP-9MP03	System Cleanliness and Foreign Material Exclusion Control	15
31MT-9RC34	Reactor Vessel Core Support Barrel Removal and Installation	4
70TI-9ZC01	Boric Acid Walkdown Leak Detection	8
73DP-0EE16	Qualification and Certification of NDE Personnel	7
73DP-9WP04	Welding and Brazing Control	12
73DP-9WP05	Weld Filler Material Control	6
73DP-9XI03	American Society of Mechanical Engineers Section XI Inservice Inspection	9
73DP-9ZC01	Boric Acid Corrosion Control Program	2
73DP-9ZZ17	Repair and Replacement – American Society of Mechanical Engineers Section XI	18
73TI-0EE01	Ultrasonic Instrument Calibration	3
73TI-0ZZ13	Radiographic Examination	15
73TI-9ZZ05	Dry Magnetic Particle Examination	14
73TI-9ZZ07	Liquid Penetrant Examination	14
73TI-9ZZ09	Ultrasonic Examination of Pipe Welds	14
73TI-9ZZ12	Ultrasonic Examination of Nozzle Inner Radius Areas	10
73TI-9ZZ20	Visual Examination of Reactor Vessel Internals	9
73TI-9ZZ22	Visual Examination for Leakage - Interval 3	2
73TI-9ZZ79	American Society of Mechanical Engineers Section XI Appendix VIII Ultrasonic Examination of Ferritic Piping	6
73WP-0ZZ07	Welding of Stainless and Nickel Alloys	14
75RP-9RP10	Conduct of R.P. Operations Appendix A3	27
N001-0302-0047	Remote Inservice Inspection of Reactor Vessel Nozzle to Shell	0

Number	Title Welds	Revision
N001-0302-00474	Remote Inservice Inspection of Reactor Vessel Shell Welds	7
N001-0302-00476	Remote Inservice Examination of Reactor Vessel Nozzle to Safe End Nozzle to Pipe and Safe End to Pipe Welds	2
N001-0302-00484	Underwater Remote Visual Examination of Reactor Vessel Internals	5
N001-0302-00485	Reactor Vessel Inservice Inspection Trouble Shooting Guidelines	2
WCAL-002	Pulser/Receiver Linearity Procedure	9
WDI-ET-002	IntraSpect Eddy Current Inspection of Vessel Head J-Groove Welds and Tube OD Surfaces	12
WDI-ET-003	IntraSpect Eddy Current Imaging Procedure for Inspection of Reactor Vessel Head Penetrations	14
WDI-ET-004	IntraSpect Eddy Current Analysis Guidelines	13
WDI-ET-005	RPV Head CRDM Penetrations EC Examination for Wastage Detection Procedure	10
WDI-ET-008	IntraSpect Eddy Current Imaging Procedure for Inspection of Reactor Vessel Head Penetrations with Gap Scanner or UT/ET Neptune	11
WDI-STD- 101	RVHI Vent Tube J-Weld Eddy Current Examination	7
WDI-UT-011	IntraSpect NDE Procedure for Inspection of Reactor Vessel Head Vent Tubes	13
WDI-UT-013	IntraSpect UT Analysis Guidelines	14
WDI-UT-OIO	IntraSpect Ultrasonic Procedure for Inspection of Reactor Vessel Head Penetrations Time of Flight Ultrasonic Longitudinal Wave & Shear Wave	18

DRAWINGS

Number	Title	Revision
13-N001-709-343	1 BW CH VLV CH 866-869, 787, 802, 807 and 812	4
M018-00500	Intercoolers & Piping	11
M018-00501	Intercoolers & Piping	12

PALO VERDE ACTION REQUESTS

3085856	3003888	3003892	3303594	3303595	3303596
2986618	3091859	3303569	3303599	3303600	3304108
3303570	3303587	3303571	3308766	3317239	3083478
3314980	3303572	3303573	3098637	3164644	3252855
3303574	3303575	3303576	3304112	3313308	3316940
3303577	3303578	3303590	3303591	3303592	3303593

NONDESTRUCTIVE EXAMINATION REPORTS

09-RT-218	09-RT-260	09-UT-3028	09-PT-209	09-PT-224	09-PT-225
09-UT-3029	09-MT-3006	09-MT-151	09-PT-228	09-PT-242	09-PT-245
09-MT-152	09-MT-155	09-MT-156	09-PT-246	09-PT-250	09-PT-252

WORK ORDERS

3156882	3225990	3225991	3173268	3214241	3010261
3223948	3116689	3280389	3155886		

MISCELLANEOUS

Document	Date/Revision
3INT-ISI-3, 3rd Inspection Interval ISI Inspection Program Summary Manual PVNGS Unit 3	0
SWMS No. 3194996, Palo Verde Nuclear Generating Station Nuclear Energy Institute 03-08 Material Initiative Program Self Assessment	September 24, 2008
3rd Inspection Interval Inservice Inspection Program Summary Manual Palo Verde Nuclear Generating Station Unit 3,	March 19, 2009
Code Case N729-1, Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1	March 28, 2006
Letter from Michael T. Markley (NRC) to Randall K. Edington, Palo Verde Nuclear Generating Station Unit 3 – Relief Request No. 42 Re: 10 CFR 50.55a(g)(6)(ii)(D)(3) Requirement for Demonstrated Volumetric Leak Path Assessment (TAC NO. ME0416)	April 8, 2009
Letter from Michael T. Markley (NRC) to Randall K. Edington, Palo Verde Nuclear Generating Station Units 1, 2, and 3 Relief Request Nos. 18 and 36 Re: Third 10-year Inservice Inspection Program Interval (TAC Nos. MD8712, MD8713, and MD8714)	November 10, 2008
Steam Generator Eddy Current Program RSG DM Manual	Revision 4
NEI 97-06, Steam Generator Program Guidelines	December 1997

**Section 1R11: Licensed Operator Requalification Program**

PALO VERDE ACTION REQUESTS

3312015      3206555      3312234      3314044

CONDITION REPORTS / DISPOSITION REPORTS

3312554      3220601

CONDITON REPORT ACTION ITEMS

3312555      3314318      3314674      3314677      3314684

MISCELLANEOUS

Document	Date/Revision
Operations Training Department Critical Task List	Revision 6
NUREG 1021, Operator Licensing Examination Standard for Power Reactors	Revision 9
PVNGS Emergency Planning Form EP-0541, Palo Verde NAN Emergency Message Form, Crew 3D	
PVNGS Scenario # SES-0-09-05, RCS Leak, Loss of NC to Containment, Loss of PW, LOCA with no HPSI FRP (MVAC-2)	July 6, 2008
PVNGS Crew 3D Training Active Action Plan	
Apparent Cause Evaluation (ACE) Report – Licensed Operators Performing Licensed Duties in the Control Room without Being Qualified	April 11, 2009
Unit 1 Control Room Log	January 4, 2009
Unit 1 Control Room Log	March 27-29, 2009
Unit 1 Control Room Log	April 1-10, 2009
Unit 1 Control Room Log	October 3, 2008
Unit 1 Control Room Log	July 2, 2008
Raw Data, Excel Spread Sheet – License Hours 2008 Fourth Quarter	
Raw Data, Excel Spread Sheet – License Hours 2008 Third Quarter	
Raw Data, Excel Spread Sheet – License Hours 2008 Second Quarter	
Simulator Evaluation Summary Sheet for Crew #34 evaluation	June 4, 2009

**Section 1R12: Maintenance Effectiveness**

**PROCEDURES**

Number	Title	Revision
01DP-9ZZ01	Systematic Troubleshooting	5
73ST-9XI13	Train A HPSI Injection and Miscellaneous SI Valves – Inservice Test	23
39MT-9ZZ32	Motor Operated Valve Diagnostic Testing	11
39MT-9ZZ02	PM or EQ Inspection of the Limitorque SMB/SB/SMC Motor Operated Valve Actuators	28
39MT-9ZZ06	Disassembly/Assembly of Type SMB/SB-00 Actuators	13
39MT-9ZZ32	Motor Operated Valve Diagnostic Testing	9
39MT-9ZZ14	Troubleshooting Motor Operated Valve Actuators	3

**DRAWINGS**

Number	Title	Revision
02-J-SGE-0072	Instrument Loop Wiring Diagram Main Steam System	3
02-M-SGP-0001	P&I Diagram Main Steam System	66
02-J-SGE-0073	Instrument Loop Wiring Diagram Main Steam System	2
01-M-SIP-0001	P&I Diagram Safety Injection and Shutdown Cooling System	42
VTM-L200-0001	Vendor Technical Manual for Limitorque Motor Operated Valves	8

**PALO VERDE ACTION REQUESTS**

3311638      3319994

**WORK ORDERS**

3311797      3314386      3187813      2918009      3319995      3232319

**MISCELLANEOUS**

Document	Date/Revision
Troubleshooting Game Plan - MSIV 2JSGEUV0180 Train B Erratic Accumulator Pressure	Revision 2
Troubleshooting Game Plan - Valve 1JSIAUV0669 Failed During 'Close' Stroke Timing	Revision 0

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

PROCEDURES

Number	Title	Revision
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	12
01DP-0ZZ01	Systematic Troubleshooting	3
73ST-9DF01	Diesel Fuel Oil Transfer Pump – Inservice Test	19
73ST-9SI06	Containment Spray Pumps and Check Valves – Inservice Test	26
73ST-9XI10	Train B Low Pressure Safety Injection Discharge Check Valve – Inservice Test	18
73ST-9XI13	Train A HPSI Injection and Miscellaneous SI Valves – Inservice Test	23

PALO VERDE ACTION REQUESTS

3321629      3284044      3319994      3311638

CONDITON REPORTS / DISPOSITION REPORTS

3287805

WORK ORDERS

3316972      3317291      3128064      3296276      3284044      3319995  
3311797

MISCELLANEOUS

Document	Date/Revision
Scheduler’s Evaluation of PV Unit 2	Week of April 19, 2009
Troubleshooting Game Plan – 2MDFBP01 Nonfunctional During Performance of 73ST-9DF01	
Troubleshooting Game Plan - Valve 1JSIAUV0669 Failed During ‘Close’ Stroke Timing	Revision 0
Troubleshooting Game Plan - MSIV 2JSGEUV0180 Train B Erratic Accumulator Pressure	Revision 2

Scheduler's Evaluation of PV Unit 1

Week of April 26, 2009

Scheduler's Evaluation of PV Unit 2

Week of April 26, 2009

**Section 1R15: Operability Evaluations**

**PROCEDURES**

Number	Title	Revision
40DP-9OP26	Operability Determination and Functional Assessment	23
40DP-9OP26	Operability Determination and Functional Assessment	24
40EP-9EO06	Loss of All Feedwater	14
40EP-9EO10	Standard Appendices, Appendix 41, Local Operation of AFN-P01	60
74DP-9CY04	Systems Chemistry Specifications	61
73DP-9XI03	American Society of Mechanical Engineers Section XI Inservice Inspection	9
81DP-0DC13	Deficiency Work Order	25

**DRAWINGS**

Number	Title	Revision
01-M-SGP-001, Sheet 2	P&I Diagram Main Steam System	60
01-M-SGP-002	P&I Diagram Main Steam System	46

**PALO VERDE ACTION REQUESTS**

3308601	3318019	3319258	3033604	3318079	3281680
3282254	3283865	3303627	3306294	3313892	

**CONDITON REPORTS / DISPOSITOIN REPORTS**

3073996	3282706	3282937	3288651	3312005	3306667
3314295					

**CONDITION REPORT ACTION ITEMS**

3306668	3161863	3288652
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**WORK ORDERS**

3020492	3202233	3231106	3231107
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## MISCELLANEOUS

Document	Date/Revision
Ultrasonic Thickness Examination Report 09-0131	
Ultrasonic Thickness Examination Report 09-0132	
Calculation 13-MC-SG-318, Pressure/Temperature Rating of N2 Back Up System for ADV's	Revision 1
Attached Media File to PALO VERDE ACTION REQUEST Related to Design Vulnerability Affecting the Non-Essential AFW Pump	April 24, 2009
Discovery Checklist for potential nonconforming condition associated with design vulnerability affecting the Non-Essential AFW System	April 24, 2009
Updated Final Safety Analysis Report, Section 10.4.7, Condensate and Feedwater System	Revision 14
Updated Final Safety Analysis Report, Section 10.4.9, Auxiliary Feedwater System	Revision 14
Technical Specifications Bases, Section 3.7.5, Auxiliary Feedwater (AFW) System	Revision 42
Prompt Operability Determination, AFN Flow Path Availability During Loop, Palo Verde Action Request 3318019	Revision 0
Study 13-NS-C081, Significance Determination for Unit 3 DGA K1 Relay Failures – 7/25/06, 9/22/06, Appendix C, Battery Capacity During Station Blackout Without Gas Turbine Generator	
Unit 2, Chemistry Control Instruction	April 27, 2009
Unit 2, Essential Cooling Water Chloride graph	August 2008 – May 2009
System Health Report	January 1 – June 30, 2008
Essential Cooling Water A Heat Exchanger Tube Leak Engineering Game Plan	May 1, 2009
Technical Requirements Manual 3.4.103, Structural Integrity	
Unit 2, Essential Cooling Water Heat Exchanger A Thermal Performance Test	November 29, 2006
Specification 13-CN-0380, Installation Specification for Seismic Category IX & Non-Seismic Scaffolding	Revision 11
Engineering Design Change 2009-00331, Revise Scaffolding Specification 13-CN-0380	April 1, 2009

Essential Cooling Heat Exchanger (EW1B) Thermal Performance Test Report

**Section 1R18: Plant Modifications**

WORK ORDERS

3082153      3082160

**Section 1R19: Post-Maintenance Testing**

PROCEDURES

Number	Title	Revision
31MT-9SP01	Essential Spray Pond Pump Disassembly and Assembly	12
39MT-9ZZ02	PM or EQ Inspection of the Limitorque SMB/SB/SMC Motor Operated Valve Actuators	28
39MT-9ZZ06	Disassembly/Assembly of Type SMB/SB-00 Actuators	13
39MT-9ZZ14	Troubleshooting Motor Operated Valve Actuators	3
39MT-9ZZ32	Motor Operated Valve Diagnostic Testing	11
39MT-9ZZ32	Motor Operated Valve Diagnostic Testing	9
40ST-9DG01	Diesel Generator A Test	35
73ST-9XI13	Train A HPSI Injection and Miscellaneous SI Valves – Inservice Test	23

DRAWINGS

Number	Title	Revision
01-M-SIP-0001	P&I Diagram Safety Injection and Shutdown Cooling System	42
VTM-L200-0001	Vendor Technical Manual for Limitorque Motor Operated Valves	8

PALO VERDE ACTION REQUESTS

3306933      3319994      3323270

WORK ORDERS

3307481      3307482      3307943      3319995      3127989      2782514

MISCELLANEOUS

Document

Magnetic Particle Examination Report 09-121

10 CFR 50.59 Screening/Evaluation S-09-0088

**Section 1R20: Refueling and Other Outage Activities**

PROCEDURES

Number	Title	Revision
31MT-9RC30	Reactor Vessel Head Removal and Installation	3
73ST-9CL01	Containment Leakage Type "B" and "C" Testing	31
01DP-9ZZ01	Systematic Troubleshooting	5
93DP-0LC07	10 CFR 50.59 & 72.48 Screenings and Evaluations	18
30DP-9MP01	Conduct of Maintenance	60
01DP-0AP12	Palo Verde Action Request Processing	10
40DP-9OP26	Operability Determination and Functionality Assessment	25
30DP-9WP02	Maintenance Work Order Process and Control	55
40OP-9ZZ05	Power Operations	130
72PY-9RX04	Low Power Physics Tests Using RMAS	16
01PR-0AP04	Corrective Action Program	3
70DP-0MR01	Maintenance Rule	27
32MT-9PE01	Cleaning, Inspection, and Testing of the Class 1E Diesel Generator	20
90DP-0IP10	Condition Reporting	43
40DP-9WP01	Operations Processing of Work Orders	15
40DP-9OP29	Power Block Permit and Tagging	35
02DP-0ZZ02	PVNGS Site Tagging Standard	6
51DP-9OM03	Site Scheduling	23
93DP-0LC05	Regulatory Interaction and Correspondence Control	14

40DP-9OP02	Conduct of Shift Operations	45
70DP-0RA03	Probabilistic Risk Assessment Model Control	6
71DP-0EM01	Risk Management Program Expert Panel	9
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	13
30DP-9MP03	System Cleanliness and Foreign Material Exclusion Controls	15
40OP-9MT02	Main Turbine	64
40OP-9MB01	Main Generation and Excitation	45
40OP-9ZZ04	Plant Startup Mode 2 To Mode 1	56

DRAWINGS

Number	Title	Revision
03-M-CTP-001	P&I Diagram Condensate Storage and Transfer System	15
03-M-AFP-001	P&I Diagram Auxiliary Feedwater System	24
03-M-SGP-001	P&I Diagram Steam Generator System	54

PALO VERDE ACTION REQUESTS

3079702	3132543	3312236	3312707	3317239	3303569
3303670	3225990	3303587	3324260	3328062	3311997
3313072	3156026	3313463	3330560	3244313	

CONDITON REPORTS / DISPOSITION REPORTS

3082599      3253530

CONDITION REPORT ACTION ITEMS

3082600

WORK ORDERS

3312237	2973440	3312712	2964093	3326886	3314544
3032406	2782514				

TAGGING PERMITS

157462	157481	157549	158550	158582	158552
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158551	158347	158730	159275	163025	157550
147540	152152	160530	157534	159391	160453

MISCELLANEOUS

Document	Date/Revision
3R14 Refueling Outage Probability Risk Assessment	
3R14 Refueling Outage Maintenance Overview Schedule	
3R14 Shutdown Risk Assessment, Revision 0	
System Health Report for Containment Leak Rate Testing Program	Fourth Quarter 2008
Technical Specification 5.5.16, Containment Leakage Rate Testing Program	
Technical Specification 3.6.1, Containment	
Technical Specification 3.6.3, Containment Isolation Valves	
Technical Specification 3.9.3, Containment Penetrations	
Unit 3 Refueling Outage 14, Local Leak Rate Test Worksheet	April 16, 2009
Regulatory Guide 1.163, Performance-Based Containment Leak-Test Program	
Results of Boric Acid Walkdown	March 25, 2009
NRC Operating Experience Smart Sample (OpESS) FY 2007-03, "Crane and heavy lift inspection, supplement guidance for IP 71111.20"	

**Section 1R22: Surveillance Testing**

PROCEDURES

Number	Title	Revision
73ST-9XI29	LPSI/CS Suction and RWT Outlet Check Valves – Inservice Test	15
73ST-9XI14	Train B HPSI Injection and Miscellaneous SI Valves – Inservice Test	27
PG 1300-03	Sensitive Issues Manual	1
40DP-9OP02	Conduct of Shift Operations	44
40AO-9ZZ11	CEA Malfunctions	13
40ST-9SF01	CEA Operability Checks	25

Number	Title	Revision
40ST-9DG01	Diesel Generator A Test	37
73ST-9SI11	Low Pressure Safety Injection Pumps Miniflow – Inservice Test	23
73ST-9AF02	AFA-PO1 Recirc Flow – Inservice Test	47

**WORK ORDERS**

3142219      3127790      3127913      3128063      3072060

**PALO VERDE ACTION REQUESTS**

3312391

**MISCELLANEOUS**

Document	Date/Revision
Tailboard briefing sheet for CEA Operability Checks	April 13, 2009
Tailboard briefing sheet for AFA – PO1 Surveillance Checks	April 13, 2009
NRC Operating Experience Smart Sample (OpESS) FY 2008-01, “Negative Trend and Recurring Events Involving Emergency Diesel Generator”	

**Section 1EP6: Drill Evaluation**

**PROCEDURES**

Number	Title	Revision
EPIP 99	EPIP Standard Appendices	26

**MISCELLANEOUS**

Document	Revision
PVNGS Emergency Planning Form EP-0541, Palo Verde NAN Emergency Message Form, Crew 3D	
NEI 99-02, Regulatory Assessment Performance Indicator Guideline	Revision 5

**Section 2OS1: Access Controls to Radiologically Significant Areas**

**PROCEDURES**

Number	Title	Revision
75DP-0RP01	Radiation Protection Program Overview	8
75DP-0RP02	Radiation Contamination Control	14

75DP-9RP01	Radiation Exposure and Access Control	9
75RP-0RP01	Radiological Posting and Labeling	27
75RP-9RP01	Radiation Exposure and Access Control	15
75RP-9RP07	Radiological Surveys and Air Sampling	17
75RP-9RP10	Conduct of Radiation Protection Operations	27
75RP-9OP02	Control of High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas	23

PALO VERDE ACTION REQUESTS

3312679

CONDITION REPORTS / DISPOSITION REPORTS

3235124      3240152

MISCELLANEOUS

Document

2008 Radiation Protection Final Audit Report  
 2006-005 Refueling Outage Audit Report Final  
 Unit 3 Refueling Outage 14, Big Scope  
 Palo Verde Collective Radiation Exposures by Section

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

3-1403	Reactor Coolant Pump Diffuser and Suction Pipe Inspections
3-1424	3-Dimensional Laser Scanning/Templating
3-3000	Control Element Assembly Replacement
3-3002	Reactor De-stack and Restack
3-3045	Reactor Vessel Head Penetration Inspection
3-3306	Primary Side Steam Generator Maintenance
3-3320	Remove and Replace Reactor Coolant Pump 1A Impeller and Seal Assembly
3-3412	Pressurizer Heater Cut Out and Replacement

**Section 20S2: ALARA Planning and Controls**

PROCEDURES

Number	Title	Revision
75DP-0RP03	ALARA Program Overview	3
75DP-0RP06	ALARA Committee	5

75RP-9RP12 ALARA Reports

3

MISCELLANEOUS

Document

Unit 3 Refueling Outage 14, Update and Checkbook  
Declared Pregnant Worker records and dose evaluations

**SECTION 4OA1: PERFORMANCE INDICATOR VERIFICATION**

PROCEDURES

Number	Title	Revision
75RP-0LC01	Performance Indicator: Occupational Radiation Safety Cornerstone	2
75RP-0LC02	Performance Indicator: Public Radiation Safety Cornerstone	1
70DP-0PI01	Performance Indicator Data Mitigating Systems Cornerstone	4
93DP-0LC09	Data Collection and Submittal Using INPO's Consolidated Entry System	9

PALO VERDE ACTION REQUESTS

3312650      3197155      3258285      3345825      3346020

CONDITION REPORTS / DISPOSITION REPORTS

3313029

MISCELLANEOUS

Document	Date/Revision
Units 1, 2, and 3 Mitigating Systems Performance Indicator Consolidated Entry Derivation Reports	April 2009
Units 1, 2, and 3 Operating Logs	April 1, 2008, through March 31, 2009
Units 1, 2, and 3 Mitigating Systems Performance Indicator Failure Records	April 2008 through March 2009
Units 1, 2, and 3 Margin Reports for Mitigating Systems Performance Indicator	April 2008 through March 2009

**Section 4OA2: Identification and Resolution of Problems**

PROCEDURES

Number	Title	Revision
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01DP-0AC06	Site Integrated Business Plan/Site Integrated Improvement Plan Process	9
01DP-0AP12	Palo Verde Action Request Processing	10
01PR-0AP04	Corrective Action Program	3
81DP-0DC13	Deficiency Work Order	25
01DP-0AP16	PVNGS Self-Assessment and Benchmarking	6
60DP-0QQ02	Trend Analysis and Coding	21

DRAWINGS

Number	Title	Revision
6661E54	Section A-A Palo Verde Unit III Supreme Assembly	0

PALO VERDE ACTION REQUESTS

3324329      3321699      3325623      3239534

WORK ORDERS

3155866      3322276

MISCELLANEOUS

Document	Date/Revision
System Health Reports	May 2009
PVNGS Monthly Trend Report	May 2009
PVNGS SIIP Performance Indicators	May 2009
Condition Reporting Trend Report	1 <sup>st</sup> Quarter 2009
PVNGS NAD Audit Report 2009-004	
NDE Examination of Reactor Vessel	May 4, 2009

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

Procedures

Number	Title	Revision
40OP-9CH12	Refueling Water Tank Operations	29
73ST-9SI06	Containment Spray Pumps and Check Valves – Inservice Test	26
73ST-9XI10	Train B Low Pressure Safety Injection Discharge Check Valve – Inservice Test	18

PALO VERDE ACTION REQUESTS

3284044      3085457      33328962

CONDITION REPORT ACTION ITEMS

3106310

WORK ORDERS

3296276      3295026

CONDITION REPORTS / DISPOSITION REPORTS

3330011

MISCELLANEOUS

Document

Event Notification 45068

Licensee Event Report 2009-001-00, Safety Injection System Recirculation Alignment Results in Unanalyzed Condition

10 CFR 50.73 Licensee Event Report System

NRC Bulletin 88-04: Potential Safety-Related Pump Loss

**Section 40A5: Other Activities**

PROCEDURES

Number	Title	Revision
WPS 01-08-T-8301-Surge-102830	Welding Procedure Specification	1
WPS 08-08-T-001-Butter SS	Welding Procedure Specification	2
WPS 01-08-T-804-Bottom	Welding Procedure Specification	1
73TI-9ZZ08	High Temperature Liquid Penetrant Examination	13
03-N001-0607-00459	Work Traveler For the Shutdown Cooling Nozzle WOL Installation	2
14DP-0FP34	Firewatch Duties	12

PALO VERDE ACTION REQUESTS

3219290

CONDITION REPORTS / DISPOSITION REPORTS

3319830

WORK ORDERS

2967856      2967859      2967865      2967869      2967879

MISCELLANEOUS

Document	Date/Revision
MRP-139, Materials Reliability Program: Primary System Piping Butt Weld Inspection and Evaluation Guidelines	August 2005
Alloy 600 Management Program Plan	February 18, 2009
N001-0607-00449, Welding Procedure Specification for Gas Tungsten Arc Welding - P-No.1 to P-No. 8	Revision 1
3162071, Focused Self-Assessment, Fire Watch Tours	May 2009
OI Report 4-2008-071, Palo Verde Nuclear Generating Station, Unit 1: Failure by Security Officer to Conduct Required Hourly Fire Watch Tours	February 2009