



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

October 30, 2009

Randall K. Edington,
Executive Vice President, Nuclear
and Chief Nuclear Officer
Mail Station 7602
Arizona Public Service Company
P.O. Box 52034
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**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION - NRC INTEGRATED
INSPECTION REPORT 05000528/2009004, 05000529/2009004, AND
05000530/2009004**

Dear Mr. Edington:

On September 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 October 1, 2009, with Mr. D. Mims 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 one NRC-identified finding and two self-revealing findings of very low safety significance (Green). All of these findings were determined to involve violations of NRC requirements. 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 05000528/2009004, 05000529/2009004, and 05000530/2009004
w/Attachment: Supplemental Information

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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: 05000528/2009004, 05000529/2009004, 05000530/2009004

Licensee: Arizona Public Service Company

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

Location: 5951 S. Wintersburg Road
Tonopah, Arizona

Dates: July 1 through September 30, 2009

Inspectors: J. Bashore, Resident Inspector
M. Catts, Resident Inspector
J. Melfi, Resident Inspector
R. Treadway, Senior Resident Inspector

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

SUMMARY OF FINDINGS

IR 05000528/2009004, 05000529/2009004, 05000530/2009004; 07/01/09-09/30/09; Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Surveillance Testing, Identification and Resolution of Problems, and Event Follow-up.

This report covered a 3-month period of inspection by resident inspectors. The inspection identified three Green findings. 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: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure of the licensee to promptly identify and correct a deficiency associated with the emergency diesel generator voltage regulator K-4 relay in a timely manner. Specifically, on October 16, 2004, maintenance personnel identified that the K-4 relay had a high resistance of approximately 800 ohms but did not replace the relay as required by procedures. This resulted in the failure of the emergency diesel generator to start following maintenance activities on May 7, 2009. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3385257.

The finding is more than minor because it is associated with equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the reliability and capability of systems that respond to initiating events. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to require a Phase 2 and Phase 3 analysis by a senior reactor analyst, because the finding resulted in an actual loss of safety function of a single train for greater than its technical specification allowed outage time. Based on the analysis performed, the analyst concluded that the finding had very low safety significance. This assessment was based on three failures of the K-4 relay having occurred in approximately 170 starts and crediting seven hours for the station batteries during a loss of offsite power event resulting in a core damage frequency of 3.8E-7. This finding was evaluated as not having a crosscutting aspect because the performance deficiency is not indicative of current performance (Section 1R22).

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the failure of maintenance personnel to promptly identify and correct a deficiency associated with the Unit 2 emergency diesel generator train B fuel oil transfer pump. Specifically, in December of 2004 Unit 3 train A diesel fuel oil transfer pump failed due to water intrusion through electrical conduit. During an extent of condition review water

intrusion was also found to affect Unit 2 train B transfer pump. Due to ineffective corrective actions, on April 22, 2009 Unit 2 train B diesel fuel oil transfer pump failed due to the effects of water intrusion causing an electrical short to ground. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3385257.

The finding is greater than minor because it is associated with the equipment performance 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 require a Phase 2 and Phase 3 analysis by a senior reactor analyst, because the finding resulted in an actual loss of safety function of a single train for greater than its technical specification allowed outage time. Based on the analysis performed, the analyst concluded that the finding had very low safety significance because the fuel oil transfer pump was capable of performing a majority of its intended safety function resulting in a core damage frequency of approximately $1.7E-7$. This finding was evaluated as not having a crosscutting aspect because the performance deficiency is not indicative of current performance (Section 4OA2).

- Green. A self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," was identified for failure of fire protection personnel to adequately implement a functional test procedure. Specifically, on September 21, 2009, fire protection personnel failed to correctly implement procedural steps resulting in the inadvertent actuation of fire dampers in the Unit 1 control building ventilation system during functionality testing of the CO₂ fire suppression system. This issue was entered into the licensee corrective action program as Palo Verde Action Request 3381290.

The finding is more than minor because it is associated with the human performance attribute of the mitigating systems cornerstone and affects the cornerstone objective of ensuring the reliability, availability and capability 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 work practices because work control activities did not use human error prevention techniques, such as self-checking or peer-checking, so that work activities are performed safely [H.4(a)] (Section 4OA3).

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

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

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

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

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Summer Readiness for Offsite and Alternate-ac Power

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems, including conditions that could lead to loss-of-offsite power and conditions that could result from high temperatures. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator and the plant to verify that the appropriate information was being exchanged when issues arose that could affect the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the transmission system operator and the plant during off-normal or emergency events
- The explanations for the events
- The estimates of when the offsite power system would be returned to a normal state
- The notifications from the transmission system operator to the plant when the offsite power system was returned to normal

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

- Non essential 13.8 kV and 4160 Vac distribution system

- Essential 4160 Vac distribution system, including the engineered safety feature (ESF) transformers

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

b. Findings

No findings of significance were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors completed a review of the licensee's actions in response to impending adverse weather involving severe thunderstorm and high wind conditions experienced on July 20, 2009. Inspectors verified operations personnel appropriately reviewed the abnormal operating procedure entry conditions and compared actual weather conditions to the entry requirements. The inspectors also verified that all maintenance activities were reviewed for emergent plant risk and restoration, and appropriate protected area announcements were made to advise site personnel to take shelter.

These activities constitute completion of one impending adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

Partial Walkdown

a. Inspection Scope

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

- September 17, 2009, Unit 1, train A emergency diesel generator

The inspectors selected this system based on its risk significance relative to the Reactor Safety Cornerstones at the time of its inspection. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Updated Final Safety Analysis Report (UFSAR), technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the system incapable of performing its intended functions. The inspectors also walked down accessible portions of the system 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. The inspectors incorporated NRC Operating Experience Smart Sample FY2008-01, Revision 0, "Negative Trend and Recurring Events Involving Emergency Diesel Generators," supplemental guidance for IP-71111.04," into the inspections.

These activities constitute completion of one partial 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:

- July 20, 2009, diesel-driven fire pump house
- July 20, 2009, station blackout gas turbine generators
- September 14, 2009, Unit 3, auxiliary building, 100 foot, 120 foot, 140 foot elevations
- September 10, 2009, Units 1, 2 and 3, remote shutdown rooms

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 sound material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified

during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also walked down the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- August 18, 2009, Units 1, 2, and 3, auxiliary buildings, 52 foot, 70 foot elevations
- September 28, 2009, Units 1, 2, and 3, control building and emergency diesel generator buildings

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

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

Quarterly Inspection

On September 15, 2009, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance

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

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

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

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- June 5, 2009, Unit 2, main steam isolation valve 180 accumulator air/oil pump replacement due to failure of valve 180 to open
- May 18, 2009, Unit 3, emergency diesel generator train A voltage regulator failure

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

- August 13, 2009, station blackout generator train B out of service for emergent maintenance

The inspectors selected this activity based on potential risk significance relative to the Reactor Safety Cornerstones. 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 the 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 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 one emergent work control inspection sample 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:

- July 29, 2009, Unit 3, operability determination for turbine-driven auxiliary feedwater pump steam bypass line axial restraint incorrectly installed
- August 30, 2009, Units 1, 2, and 3, operability determination for bacteria in the essential spray pond
- September 24, 2009, Unit 1, operability determination for the train A and C dc electrical power sources and train A ac vital instrument bus electrical distribution system during restoration of ventilation system fire dampers

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

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

c. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

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

- July 13, 2009, Unit 1, installation of emergency diesel generator cooldown temporary monitoring equipment

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

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

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

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

- May 15, 2009, Unit 3, emergency diesel generator train A corrective maintenance for voltage regulator failure
- July 11, 2009, station blackout generator train B corrective maintenance of field flash relay for the generator

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

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

The inspectors evaluated the activities against the technical specifications, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment. The inspectors incorporated NRC Operating Experience Smart Sample FY2008-01, Revision 0, "Negative Trend and Recurring Events Involving Emergency Diesel Generators," supplemental guidance for IP-71111.19," into the inspections.

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

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the UFSAR, 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.

- May 7, 2009, Unit 3, train A emergency diesel generator K-4 relay failure
- July 13, 2009, Unit 3, at-power moderator temperature coefficient testing
- September 14, 2009, Unit 1 train A condensate storage and transfer pump inservice test
- September 24, 2009, Unit 1 CO₂ fire suppression system functional test

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

The inspectors incorporated NRC Operating Experience Smart Sample FY2008-01, Revision 0, "Negative Trend and Recurring Events Involving Emergency Diesel Generators," supplemental guidance for IP-71111.22," into the inspections.

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

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure of the licensee to correct a deficiency associated with the emergency diesel generator voltage regulator K-4 relay in a timely manner. Specifically, on October 16, 2004, maintenance personnel identified that the K-4 relay had a high resistance of approximately 800 ohms but did not replace the relay as required by procedures.

Description. On April 26, 2009, the Unit 3 train A emergency diesel generator (EDG) was taken out of service for planned maintenance during refuel outage 3R14. Unit 3 was in cold shutdown, Mode 5, and was installing two new modifications for EDG 3A, one for the K-1 relay and one for the governor control system. Following maintenance activities on May 7, 2009, the licensee performed a postmaintenance test on EDG 3A when the generator experienced a sudden loss of field excitation resulting in a loss of generator output voltage and subsequent failure of the EDG to start. The loss of excitation condition repeated itself numerous times over the following nine days as Palo Verde attempted to troubleshoot the cause of the failure. On May 14, 2009, the licensee determined the cause of the failure was from a faulty K-4 relay. The relay was replaced and on May 15, 2009, EDG 3A successfully completed its postmaintenance run and subsequent surveillance test, and the EDG was declared operable.

During the licensee's root cause investigation, it was noted that an intermittent high resistance condition could be created with the K-4 relay that would send a continuous gating signal to the rectifier bridge causing a loss of excitation and subsequent failure of the EDG to start. The purpose of the K-4 relay is to provide a means for the automatic voltage regulator to send firing signals to the rectifier bridge through a series of contacts. The licensee's root cause analysis determined that this high resistance condition was caused by a loose connection in the K-4 relay at a specific pin-to-socket interface. This particular type of relay has 20 pins that each are designed to fit tightly in their respective socket in the base plate of the relay. After further analysis, the licensee determined that the K-4 relay pin 5 socket did not conform to the other sockets because it was oversized and therefore did not allow for a tight fit.

The inspectors reviewed the root cause investigation and noted that similar failures had occurred for EDG 3A K-4 relay in 2001 and 2004. In October 2001, EDG 3A failed to reach rated voltage due to loss of excitation during performance of the 18-month integrated surveillance test. During the licensee's troubleshooting efforts, it was determined that there was a high resistance condition associated with the pin 5 socket of the K-4 relay. Palo Verde's corrective actions included inserting a foam spacer in the K-4 relay that was found missing. In October 2004, maintenance personnel were replacing faulty rectifier bridge components for EDG 3A. During postmaintenance surveillance testing the licensee noted that the voltage regulator failed to flash the excitation field resulting in the EDG failing to start. During the licensee's troubleshooting efforts, it was determined that there was a high resistance condition associated with the pin 5 socket of the K-4 relay. The licensee also noted that bumping the K-4 relay support bracket would cause resistance to change in a range from 800 ohms to 1 ohm. Palo Verde's corrective actions included inspection and cleaning of the K-4 relay.

During their review of this issue, the inspectors noted that while the October 2001 failure was evaluated as an adverse condition, the October 2004 failure was not evaluated. The inspectors also noted that in October 2001, the failure was not considered a maintenance rule functional failure because the K-4 relay failure was thought to have been caused by the maintenance that was just performed. The inspectors reviewed the licensee's maintenance rule procedures and determined that both the 2001 and 2004 failures should have been considered maintenance rule functional failures. The inspectors reviewed the licensee's corrective action procedures and also noted that if a repeat maintenance rule functional failures occurs within a three year period, a root cause investigation is required to be performed. The inspectors also noted that when maintenance personnel identified the high resistance condition on the K-4 relay in 2004, the maintenance procedure that was used required replacement of any faulty relays identified. The inspectors observed that instead of the K-4 relay being replaced, the step in the maintenance procedure was lined out as not required, and the relay was only cleaned.

After review of this issue, the inspectors determined that because the licensee failed to initiate a root cause investigation following the relay failure and because maintenance personnel failed to follow maintenance instructions in 2004, the faulty K-4 relay was never replaced as required by station procedures.

Analysis. The performance deficiency associated with this finding involved the failure of the licensee to correct a condition adverse to quality in a timely manner. The finding is more than minor because it is associated with equipment performance attribute of the

Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the reliability and capability of systems that respond to initiating events. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to require a Phase 2 and Phase 3 analysis by a senior reactor analyst, because the finding resulted in an actual loss of safety function of a single train for greater than its technical specification allowed outage time. Based on the analysis performed, the analyst concluded that the finding had very low safety significance because with only three failures of the K-4 relay in approximately 170 starts and crediting seven hours for the station batteries during a loss of offsite power event, the resulting core damage frequency is $3.8E-7$. This finding was evaluated as not having a crosscutting aspect because the performance deficiency is not indicative of current performance.

Enforcement. Title 10 of the Code of Federal Regulations Part 50, Appendix B, Criterion XVI, "Corrective Actions," states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Palo Verde Procedure 01DP-OAP10, "Corrective Action Program," stated, in part, that measures will be established to assure that conditions adverse to quality, such as failures, malfunctions, and deficiencies are promptly identified and corrected. Contrary to the above, on October 16, 2004, the licensee identified a deficiency with the emergency diesel generator voltage regulator K-4 relay but failed to take appropriate corrective actions which left this deficiency uncorrected for the Unit 3 Train A emergency diesel generator until May 2009. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Palo Verde Action Request 3385257, this violation is being treated as an NCV consistent with Section VI.A.1 of the Enforcement Policy: NCV 05000530/2009004-01, "Failure to Correct a Condition Adverse to Quality with the Emergency Diesel Generator Train A K-4 Relay in a Timely Manner."

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency planning training evolutions on September 15, 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.

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 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Specific Activity performance indicator for Palo Verde Units 1, 2 and 3, for the period from the third quarter 2008 through the second quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's reactor coolant system chemistry samples, technical specification requirements, issue reports, event reports, and NRC integrated inspection reports for the period from the third quarter 2008 through the second 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. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of three reactor coolant system specific activity samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.3 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the Reactor Coolant System Leakage performance for Palo Verde Units 1, 2, and 3 for the period from the third quarter 2008 through the second quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports, and NRC integrated inspection reports for the period from the third quarter 2008 through the second 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 reactor coolant system leakage samples as defined in 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

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

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an

integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings of significance were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

In addition to the routine review, the inspectors selected the 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.

- April 22, 2009, Unit 2, emergency diesel generator train B out of service for emergent work on the fuel oil transfer pump as documented in Condition Report/Disposition Request 3317532
- April 30, 2009, Units 1, 2, and 3, non quality related parts installed in quality applications as documented in Condition Report/Disposition Request 3321953

The inspectors incorporated NRC Operating Experience Smart Sample FY2009-01, Revision 0, "Inspection of Electrical Connections for Motor Control Center, Circuit Breakers, and Interfaces," supplemental guidance for IP-71152," into the inspections.

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

Introduction. A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the failure of maintenance personnel to correct a deficiency associated with the Unit 2 emergency diesel generator Train B fuel oil transfer pump in a timely manner.

Description. On April 22, 2009, the Unit 2 emergency diesel generator Train B fuel oil transfer pump failed surveillance test Procedure 73ST-9DF01, "Diesel Fuel Oil Pump Inservice Test," Revision 19, due to a supply breaker opening and interrupting power to the pump. Operations personnel declared the Train B emergency diesel generator inoperable. Palo Verde Action Request 3316970 was written by operations personnel to document the pump failure and required a root cause to be performed for the pump failure.

Each emergency diesel generator has its own diesel fuel oil transfer system which consists of one diesel fuel oil storage tank located in a vault, one diesel fuel oil transfer pump located inside the diesel fuel oil storage tank, and one diesel fuel oil day tank. The diesel fuel oil transfer pump takes suction from the diesel fuel oil storage tank and pumps fuel oil to the diesel fuel oil day tank. The diesel fuel oil day tank then supplies fuel to the emergency diesel generators via gravity drain.

A root cause evaluation was performed on the pump failure in Condition Report/Disposition Request 3317532. The direct cause of the failure was determined to be intrusion of moisture into the emergency diesel generator fuel oil transfer pump motor connection box located in the diesel fuel oil storage tank vault. This moisture resulted in corrosion of the motor connection box causing an electrical short to ground and subsequent tripping of the fuel oil transfer pump. The root cause was determined to be the diesel fuel oil storage tank vault electrical conduit and penetrations were not effectively maintained and monitored to prevent the intrusion of moisture into the motor connection box.

The inspectors determined that similarly, water intrusion was found in the Unit 3 Train A diesel fuel oil transfer pump electrical conduit in December 2004. In 2004, as part of the extent of condition, Work Order 2762023 inspected all six emergency diesel generator's and tested each fuel oil transfer pump, including the Unit 2 Train B fuel oil transfer pump. During performance of this work order, maintenance personnel found a small amount of moisture in the Unit 2 Train B electrical conduit. This moisture was wiped up and the conduit was sealed, but the work order did not require the removal of moisture or drying out of the conduit. Over time, the moisture migrated to the connection box causing corrosion, and as the corrosion worsened it eventually caused the pump trip in 2009.

As a corrective action, the licensee replaced the electrical conduit and the emergency diesel generator fuel oil transfer pump motor connection box in 2009. The licensee performed an extent of condition review for all of the other emergency diesel generator fuel oil storage tank vaults to inspect for the presence of moisture or corrosion in the transfer pump connection boxes. No other moisture or corrosion was found. The root cause team developed corrective actions to prevent reoccurrence by initiating a preventative maintenance task to test the power cables and to perform a visual inspection of the connection boxes for each of the fuel oil transfer pumps.

Analysis. The performance deficiency associated with this finding involved the failure of maintenance personnel to correct a condition adverse to quality with the emergency diesel generator Train B fuel oil transfer pump in a timely manner. The finding is more than minor because it is associated with the equipment performance 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 require a Phase 2 and Phase 3 analysis by a senior reactor analyst because the finding resulted in an actual loss of safety function of a single train for greater than its technical specification allowed outage time. Based on the analysis performed, the analyst concluded that the finding had very low safety significance because while the fuel oil transfer pump was degraded from January 21 through April 22, 2009, it is still credited to perform a majority of its intended safety function and the resulting core damage frequency is approximately $1.7E-7$. This finding was evaluated as not having a crosscutting aspect because the performance deficiency is not indicative of current performance.

Enforcement. Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. In 2004, Procedure 90DP-01P10, "Condition Reporting," Revision 19, Step 3.7.1, required, in part, that corrective actions include those actions that will correct an adverse condition. Contrary to this, on December 21, 2004, maintenance personnel failed to correct the adverse condition of moisture in the fuel oil transfer pump electrical conduits. Specifically, maintenance personnel failed to ensure the emergency diesel generator fuel oil storage tank vaults were effectively maintained and monitored to prevent the intrusion of moisture into the emergency diesel generator fuel oil transfer pump motor connection box, resulting in corrosion of the motor connection box causing an electrical short to ground and tripping of the fuel oil transfer pump. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Palo Verde Action Request 3385257, this violation is being treated as an NCV consistent with Section VI.A.1 of the Enforcement Policy: NCV 05000529/2009004-02, "Failure to Correct a Condition Adverse to Quality with the Emergency Diesel Generator Train B Fuel Oil Transfer Pump in a Timely Manner."

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.

- June 21, 2009, Unit 2, drop in instrument air header pressure and drop in atmospheric dump valve 185 nitrogen accumulator pressure

- July 7, 2009, Unit 1, loss of letdown due to malfunction of dilution control valve 201P
- September 21, 2009, Unit 1, loss of essential ventilation system to 100' elevation of the control building

Documents reviewed by the inspectors are listed in the attachment.

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

b. Findings

Introduction. A self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," was identified for failure of fire protection personnel to adequately implement a functional test procedure. Specifically, on September 21, 2009, fire protection personnel failed to correctly implement procedural steps and prevent actuation of fire dampers in the Unit 1 control building ventilation system during functionality testing of the CO₂ fire suppression system.

Description. On Monday, September 21, 2009, at 2:40 p.m., Palo Verde Unit 1 entered several short duration technical specifications limiting conditions for operation due to inadvertent operation of a test switch during a fire suppression functional test. This test was performed to ensure the CO₂ fire suppression system actuates during receipt of a simulated actuation signal, and was conducted for the 100' elevation of the control building. While conducting the test, fire protection personnel failed to follow a step in Procedure 14FT-9FP08, "CO₂ Fire Suppression System Functional Test," which required a CO₂ test switch to be placed in "test." Consequently, 19 fire dampers went closed affecting ventilation to train A and C battery rooms, train A and C dc equipment rooms and the train A essential switch gear room, rendering each inoperable. The shift manager entered limiting condition for operation action statements for Technical Specification 3.8.4, "DC Sources," and Technical Specification 3.8.9, "AC and DC Distribution Systems," for the train A and C battery rooms, train A and C dc equipment rooms and the train A essential switch gear room. Maintenance personnel opened the affected dampers and each technical specification action statement was exited before a shutdown of the unit was required.

The licensee initiated Palo Verde Action Request 3381290 to evaluate and identify the cause of the performance deficiency. The licensee also conducted a human performance review board to assess the actions taken by the individuals involved. The licensee determined the cause of the event was due to the failure of fire protection personnel to use human error prevention tools as prescribed by procedures. The inspectors reviewed control room logs, maintenance work procedures, and interviewed operations and fire protection personnel and determined there were no other performance deficiencies of more than minor significance noted and the licensee's corrective actions following the event were appropriate.

Analysis. The performance deficiency associated with this finding involved the failure of Fire Department personnel to adequately implement a surveillance procedure to test CO₂ fire suppression system functionality. 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, availability, and capability 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 work practices because work control activities did not use human error prevention techniques, such as self-checking or peer-checking, so that work activities are performed safely [H.4(a)].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that written procedures be established, implemented, and maintained covering the activities specified in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33, Appendix A, Section 8(b)h, requires that Fire Protection System Functional Tests that can affect the performance of safety-related equipment should be performed in accordance with written procedures. Procedure 14FT-9FP08, "CO₂ Fire Suppression System Functional Test," Step 8.4.8 stated, "to place test switch TS-1 in the "test" position to prevent dampers from actuating." Contrary to the above, on September 21, 2009, fire protection personnel failed to adequately implement procedures for functionality testing of the CO₂ fire suppression system and place the TS-1 test switch in the "test" position. However, because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Palo Verde Action Request 3381290, this violation is being treated as a noncited violation consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000528/2009004-03, "Failure to Follow Procedures Results in Loss of Ventilation to Safety-Related Equipment."

.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

.1 (Closed) Licensee Event Report 05000529/2009-001-00, Emergency Diesel Generator Fuel Oil Transfer Pump Failure

On April 22, 2009, at approximately 10:05 a.m., while performing Surveillance Test 73ST-9DF01, "Diesel Fuel Oil Pump – Inservice Test," Revision 19, the emergency diesel generator B fuel oil transfer pump failed. Troubleshooting identified the breaker for the transfer pump was found opened in the trip free position that was caused by an electrical short to ground between a terminal and the fuel oil transfer pump electrical connection box. The failure was determined to be caused by moisture in the cable connection box that initiated a corrosion process that eventually caused an electrical short to ground. The faulty terminal was repaired and the transfer pump was retested

satisfactorily. Prior to this event, moisture was discovered in the electrical conduit and the cable connection box in the Unit 3 emergency diesel generator A fuel oil transfer pump in December 2004. As part of the extent of condition, the other diesels fuel oil transfer pump cable connection boxes were inspected, and moisture was found in the Unit 2 fuel oil transfer pump B box. Corrective maintenance for the Unit 2 box consisted of wiping the moisture out of the connect box and sealing the conduits entering and leaving the connection box. The failure of the connection box in 2009 was caused by residual moisture left in the conduit from 2004. The inspectors reviewed the licensee event report and determined a violation of NRC requirements exists. This violation is documented in Section 4OA2 of this report. This Licensee Event Report is closed.

.2 (Closed) Licensee Event Report 05000528/2007-006-00, Required Shutdown due to Inoperable Steam Admission Bypass Valve to Auxiliary Feedwater Pump

On October 15, 2007, while performing surveillance test Procedure 73ST-9AF02, "AFA P01 Recirc Flow-Inservice Test," the auxiliary feedwater turbine steam admission bypass valve SGA-UV-138A, failed to close. The valve was declared inoperable, quarantined, and a troubleshooting plan was developed and implemented. Troubleshooting and corrective maintenance efforts were unsuccessful in restoring the valve to an operable status within the technical specification required time of seven days; therefore a reactor shutdown was initiated at approximately 3 am on October 22, 2007. The cause of the failure of SGA-UV-138A was the accumulation of iron oxide on the internal plunger assembly of the valve causing excessive frictional forces between the plunger and the internal surfaces of the valve body. Subsequent to the shutdown, the valve body was replaced and successfully retested. The inspectors reviewed this issue and documented a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," in Section 4OA2 of NRC Inspection Report 05000528;529;530/2007005. The licensee documented the failure of valve SGA-UV-138A in Condition Report/Disposition Request 3064675 and Condition Report/Disposition Request 3078032. The inspectors reviewed the root cause evaluation and the licensee event report and determined no additional violation of NRC requirements exists. This Licensee Event Report is closed.

.3 (Closed) Licensee Event Report 05000528/2007-007-00, Engineered Safety Feature Actuation and Required Shutdown due to failed Diode in Actuation Circuitry

On November 22, 2007, at approximately 7:18 p.m., the "BOP ESFAS A IN TEST" alarm was received in the Unit 1 control room. Shortly after this unexpected alarm, other unexpected alarms were received and the essential spray pond pump started automatically. The balance of plant engineered safety feature actuation system train 'A' load sequencer was declared inoperable, and troubleshooting to identify the cause of the event was commenced. Troubleshooting and corrective maintenance were not completed in time to restore the train to operable status within the technical specification required time of 24 hours, and Unit 1 was shut-down on November 23, 2007. The cause of the balance of plant engineered safety feature actuation system failure was the failure of a relay coil suppression diode. The failed diode was replaced and the balance of plant engineered safety feature actuation system load sequencer was successfully retested on November 25, 2007. The inspectors reviewed this Licensee Event Report and no findings of significance and no violation of NRC requirements occurred. This Licensee Event Report is closed.

.4 (Closed) Licensee Event Report 05000528;529;530/2008-001-00, Inadequate Surveillance Test Procedure Resulting in Failure to Meet Technical Specification Requirements

On February 1, 2008, during performance of the licensee's Component Design Bases Review initiative, engineering personnel determined that surveillance test Procedure 40ST-9ZZ20, "Remote Shutdown Disconnect Switch and Control Circuit Operability," was not adequate to meet the technical specification surveillance requirements. All three Palo Verde units entered Technical Specification Surveillance Requirement Condition 3.0.3 for the affected components, and the licensee performed risk assessments to support continued operability until such time as the components could be adequately tested. The cause of this condition was that the surveillance test procedure did not ensure that each circuit was verified to meet the requirements of the technical specification. The licensee's corrective actions included revising the surveillance test procedures to adequately demonstrate compliance with the technical specifications. This failure to comply with the technical specification surveillance requirements for the remote shutdown system constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The inspectors reviewed this Licensee Event Report and no findings of significance and no additional violations of NRC requirements occurred. This Licensee Event Report is closed.

.5 (Closed) Licensee Event Report 05000528;529;530/2009-003-00, Surveillance Test Procedure Inadequate to Meet the Requirements of the Technical Specifications

On May 13, 2009, Palo Verde engineers discovered surveillance requirements were not completely implemented in surveillance test Procedure 40ST-9ZZ05, "Weekly Electrical Distribution Checks." The procedure did not verify the supply breaker alignment for four Class 1E 125 Vdc distribution panels as required by technical specifications. All three Palo Verde units entered Technical Specification Surveillance Requirement Condition 3.0.3 for the affected components, and the licensee performed risk assessments to support continued operability until such time as the components could be adequately tested. The cause of this condition was that the initial surveillance test procedure written when the technical specifications were implemented lacked the appropriate technical rigor. The licensee's corrective actions included revising the surveillance test procedures to adequately demonstrate compliance with the technical specifications. This failure to comply with the technical specification surveillance requirements for the Class 1E 125 Vdc distribution system constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The inspectors reviewed this Licensee Event Report and no findings of significance and no additional violations 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 this 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.

4OA6 Meetings, Including Exit

On October 1, 2009, the inspectors conducted an exit to present the inspection results to Mr. D. Mims, Vice President, Regulatory Affairs and Plant Improvement, 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.

4OA7 Licensee-Identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee

G. Andrews, Director, Unit 3 Assistant Plant Manager
S. Bauer, Department Leader, Regulatory Affairs
R. Bement, Vice President, Nuclear Operations
P. Borchert, Unit 1 Assistant Plant Manager
F. Burdick, Regulatory Affairs
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. Hautala, Senior Engineer, Regulatory Affairs
J. Hesser, Vice President, Engineering
G. Hettel, Director, Operations
D. Mims, Vice President, Regulatory Affairs and Performance Improvement
P. Paramithas, Department Lead, Modification Engineering
T. Radtke, General Manager, Emergency Services and Support
M. Ray, Director, Emergency Planning Programs
H. Ridenour, Director, Maintenance
S. Sawtschenko, Department Leader, Emergency Preparedness
J. Summy, Director, Plant Engineering
J. Taylor, Unit Department Leader, Operations
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

05000530/2009004-01	NCV	Failure to Correct a Condition Adverse to Quality with the Emergency Diesel Generator Train A K-4 Relay in a Timely Manner (Section 1R22)
05000529/2009004-02	NCV	Failure to Correct a Condition Adverse to Quality with the Emergency Diesel Generator Train B Fuel Oil Transfer Pump in a Timely Manner (Section 4OA2)
05000528/2009004-03	NCV	Failure to Follow Procedures Results in Loss of Ventilation to Safety-Related Equipment (Section 4OA3)

Closed

05000529/2009-001-00	LER	Emergency Diesel Generator Fuel Oil Transfer Pump Failure (Section 4OA3)
05000528/2007-006-00	LER	Required Shutdown due to Inoperable Steam Admission Bypass Valve to Auxiliary Feedwater Pump (Section 4OA3)
05000528/2007-007-00	LER	Engineered Safety Feature Actuation and Required Shutdown due to failed Diode in Actuation Circuitry (Section 4OA3)
05000528;529;530/2008-001-00	LER	Inadequate Surveillance Test Procedure Resulting in Failure to Meet Technical Specification Requirements(Section 4OA3)
05000528;529;530/2009-003-00	LER	Surveillance Test Procedure Inadequate to Meet the Requirements of the Technical Specifications (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 1R01: Adverse Weather Protection

PROCEDURES

Number	Title	Revision
40AO-9ZZ21	Acts of Nature	26
51DP-9OM03	Site Scheduling	23
40AO-9ZZ12	Degraded Electrical Power	37
40AO-9ZZ25	ECC Directed Turbine Unloading	9
40OP-9ZZ19	Hot Weather Protection	3
70DP-0RA05	Assessment and Management of Risk When Performing Maintenance in Modes 1 and 2	14
40DP-9OP34	Switchyard Administrative Controls	17

Section 1R04: Equipment Alignment

PROCEDURES

Number	Title	Revision
40OP-9DG01	Emergency Diesel Generator A	61

DRAWINGS

Number	Title	Revision
01-M-DGP-001	P & I Diagram Diesel Generator System, Sheet 1	50
01-M-DGP-001	P & I Diagram Air Intake & Exhaust Diesel Generator System, Sheet 2	50
01-M-DGP-001	P & I Diagram Lube Oil Diesel Generator System, Sheet 3	50
01-M-DGP-001	P & I Diagram Jacket Water Diesel Generator System, Sheet 4	50
01-M-DGP-001	P & I Diagram Cooling Water Diesel Generator System, Sheet 5	50
01-M-DGP-001	P & I Diagram Starting Air Diesel Generator System, Sheet 6	50
01-M-DGP-001	P & I Diagram Fuel Oil Diesel Generator System, Sheet 7	50
01-M-DGP-001	P & I Diagram Control Air Diesel Generator System, Sheet 8	50
01-M-DGP-001	P & I Diagram Diesel Generator System, Sheet 9	50

PALO VERDE ACTION REQUESTS

3361344	3312043	3358340	3358360	3292998	3377235
3347593	3360757	3329837	3343785	3316959	3378191
3300357	3303013	3305907	3305910	3305911	3306176
3306933	3319433	3347623	3351639	3355706	3327583

CONDITION REPORT ACTION ITEMS

3355306

CONDITON REPORT / DISPOSITION REPORTS

3322007

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
14AC-0FP05	Pre-Fire Strategies Manual Control	1

DRAWINGS

Number	Title	Date
AO-M-HSP-001-R2	Air Balance P&ID Fire-Pump House	6/25/85

WORK ORDERS

3034922 3162525 3348685

PALO VERDE ACTION REQUESTS

3355232 3298357 2934348 3177439 3355232 2980758
3346689

CONDITON REPORT / DISPOSITION REPORTS

2928626

CONDITION REPORT ACTION ITEMS

3027886 2934348

FIRE SYSTEM COMPONENT CONDITION RECORDS

3229271 3315927

MISCELLANEOUS

VTD-P115-00012, Peerless Pump Company Horizontal Centrifugal Pumps Instructions
Installation Operation Maintenance, Revision 0

Updated Final Safety Analysis Report, Section 9.5, Revision 11

Pre-Fire Strategies Manual for Control Building Elevation 100' – 0", Revision 7

Section 1R06: Flood Protection

PROCEDURES

Number	Title	Revision
14FT-9FP70	Appendix R and Former Technical Specification Penetration Seal Surveillance	8
31MT-9ZZ12	Replacement/Rework of Penetration and Internal Conduit Seals	8

MISCELLANEOUS

Calculation 13-MC-ZA-0809, As Built Auxiliary Building Flooding Calculation, Revision 6

Calculation 13-MC-ZA-0810, Flooding Between Adjacent Safety-Related Rooms, Revision 8

Section 1R11: Licensed Operator Regualification Program

PALO VERDE ACTION REQUESTS

3379597 3379600

MISCELLANEOUS

Simulator Scenario, SES-0-09-AS-04, TLI Failure / RPCB (Loss of Feed Pump) / FRP (LOAF-condensate pumps)

Simulator Evaluation Summary Sheet, 09/15/2009

Form EP-0541, Palo Verde NAN Emergency Message Form, 09/15/2009

Simulator Performance Indicator Evaluation Form, Revision 4

Section 1R12: Maintenance Effectiveness

PROCEDURES

Number	Title	Revision
01DP-0ZZ01	Operational Decision Making	2
01PR-OAP04	Corrective Action Program	0
90DP-0IP10	Condition Reporting	18
32MT-9PE01	18 Month Cleaning, Inspection and Testing of the Class 1E Diesel Generator	
70DP-0MR01	Maintenance Rule	8

PALO VERDE ACTION REQUESTS

3344761 3337724 3298296 3338425

CONDITION REPORTS / DISPOSITION REPORTS

3346271 3338918 3338918 3325283 2432009

WORK ORDERS

3141993 2431019 2728901 244601 243880

MISCELLANEOUS

Unit 2 Control Room Logs, June 5, 2009

Troubleshooting Game Plan for MSIV 181 Train B, March 20, 2009

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	Operational Decision Making	2
40OP-9GT03	Station Blackout Generator 2 Operation	1

PALO VERDE ACTION REQUESTS

3365241

CONDITON REPORTS / DISPOSITION REPORTS

33656952

WORK ORDERS

3295966 3365243 3365243

Section 1R15: Operability Evaluations

PROCEDURES

Number	Title	Revision
40DP-9OP26	Operations Palo Verde Action Request Processing and Operability Determination and Functional Assessment	26
81DP-0DC13	Deficiency Work Order	25

Number	Title	Revision
40OP-9HJ01	Control Building HVAC (HJ)	26
40OP-9HJ02	Control Building HVAC (Smoke Removal)	4
40ST-9EC03	Essential Chilled Water & Ventilation Systems Inoperable Action Surveillance	14
40AO-9ZZ20	Loss of HVAC	3
40DP-9OP02	Conduct of Shift Operation	48
40DP-9OP22	Operations Log Keeping	33
40DP-9OP23	Technical Specification Component Condition Record SWMS Procedure	7

DRAWINGS

Number	Title	Revision
03-P-AFF-131	M.S.S.S. Isometric Turbine Driven Pump Auxiliary Feedwater System	0
01-M-HJP-001	P & I Diagram Control Building HVAC	26
01-M-HJP-002	P & I Diagram Control Building HVAC	14

PALO VERDE ACTION REQUESTS

3326016 3326054 3338222 3338300 3324435 3325566
3324567 332549

CONDITON REPORTS / DISPOSITION REPORTS

3329999 3327134

CONDITION REPORT ACTION ITEMS

3336564 3343875 3382436

WORK ORDERS

3326188 3381297

ENGINEERING WORK REQUESTS

3381319 3382891

FIRE SYSTEM COMPONENT CONDITION RECORD

3381295

TECHNICAL SPECIFICATION COMPONENT CONDITION RECORD

3381310

MISCELLANEOUS

Calculation 03-MC-AF-503, Auxiliary Feedwater System – Axial Restraint, Revision 4

BART Test Heterotrophic Aerobic Bacteria Data Sheet

BART Test Iron-Related Bacteria Data Sheet

PNVGS Updated Final Safety Analysis Report, Section 9.4, Air Conditioning, Heating, Cooling and Ventilation Systems, Revision 11

PVNGS Technical Specifications Bases, Revision 35

PK Battery Room Essential Exhaust Fan Operability Considerations, June 23, 2006

Control Room Narrative Logs for September 21, 2009 and September 22, 2009

Study 13-MS-A107, Loss of Essential Chillers Study, Revision 1

Calculation 13-MC-HJ-0003, “HJ System Heat Load and Equipment Selection Calculation,” Revision 6

Section 1R18: Plant Modifications

PROCEDURES

Number	Title	Revision
40DP-9OP29	Power Block Permit and Tagging	35
30DP-9MP03	System Cleanliness and Foreign Material Exclusion Controls	15

WORK ORDERS

3344401 3344258

Miscellaneous

S-09-0170, 50.59 screening for temporary installation of a strip chart recorder to monitor specific key parameters, to support determination of the cause for the Unit 1, Train B, emergency diesel generator cooldown cycle trips, Revision 0

Section 1R19: Post-Maintenance Testing

PROCEDURES

Number	Title	Revision
40OP-9GT03	Station Blackout Generator 2 Operation	1
01DP-0ZZ01	Operational Decision Making	2
01PR-OAP04	Corrective Action Program	0
32MT-9PE01	18 Month Cleaning, Inspection and Testing of the Class 1E Diesel Generator	

PALO VERDE ACTION REQUESTS

3365241 3298296 3338425

CONDITON REPORTS / DISPOSITION REPORTS

33656952 3325283 2432009

WORK ORDERS

3295966 3365243 3365243 2431019 2728901 244601

Section 1R22: Surveillance Testing

PROCEDURES

Number	Title	Revision
72ST-9RX02	Moderator Temperature Coefficient at Power	24
01PR-0AP04	Corrective Action Program	0
90DP-0IP10	Condition Reporting	18
32MT-9PE01	18 Month Cleaning, Inspect and Testing of the Class 1 EDG	10
70DP-0MR01	Maintenance Rule	8
14FT-9FP08	CO2 Fire Suppression System Functional Test	11
14DP-0FP31	Fire System Impairment	13
14DP-0FP01	Firewatch Requirements	10
14DP-0FP02	Fire System Impairments and Notifications	14
73DP-0FP01	Fire Protection Test Program Requirements	26

DRAWINGS

Number	Title	Revision
B72-08600-712	Schematic-Switching Module	C
01-M-HJP-002	P & I Diagram Control Building HVAC	14
01-M-HJP-001	P & I Diagram Control Building HVAC	26
01-M-FPP-004	P & I Diagram Fire Protection System (CO2 System)	10

WORK ORDERS

3312124 2431019 243880 2728901 244601 03096436

PALO VERDE ACTION REQUESTS

3381290

CONDITION REPORTS / DISPOSITION REPORTS

3325283 2432009

MISCELLANEOUS

Significant Root Cause Investigation Report, "Loss of Excitation on Unit 3 'A' Emergency Diesel Generator during Retest," Revision 0

Prompt Human Performance Evaluation Form, September 21, 2009

Personal Statements of Events from Fire Department and Operations Personnel, September 21, 2009

PVNGS Updated Final Safety Analysis Report, Section 9.5.1, Revision 13

Section 1EP6: Drill Evaluation

PROCEDURES

Number	Title	Revision
EPIP-02	Operation Support Center Actions	33
EPIP-03	Technical Support Center Actions	52
EPIP-04	Emergency Operations Facility Actions	48
EPIP-99	Emergency Plan Implementing Procedure Standard Appendices, Appendix B, Protective Action Recommendations	27
EPIP-99	Emergency Plan Implementing Procedure Standard Appendices, Appendix D, Notifications	27

SECTION 40A1: PERFORMANCE INDICATOR VERIFICATION

PROCEDURES

Number	Title	Revision
74DP-0LC01	RCS Activity Performance Indicator	5
74OP-9SS01	Primary Sampling Instructions	33
74ST-9RC02	RCS Specific Activity Surveillance Test	12

Number	Title	Revision
40ST-9RC02	ERFDADS (Preferred) Calculation of RCS Water Inventory	51
74CH-9ZZ15	RCS Gross Activity and Dose Equivalent I-131 Determination	4

MISCELLANEOUS

Technical Specification 3.4.16, RCS Leak Detection Instrumentation
 Technical Specification 3.4.17, RCS Specific Activity
 NEI 99-02, Regulatory Assessment Performance Guideline, Revision 5

Section 40A2: Identification and Resolution of Problems

PROCEDURES

Number	Title	Revision
73ST-9DF01	Diesel Fuel Oil Transfer Pump – Inservice Test	19
40DP-9OP26	Operations PVAR Processing and Operability Determination / Functional Assessment	26

PALO VERDE ACTION REQUESTS

3321629	3316970	3332198	3332070	3332477	3332885
3333364	3333380	3333384	3333386	3333397	3333400
3333398	3333439	3333476	3333470	3333486	3333498
3333499	3333517	3333519	3333530	3333404	3333547
3334881	3334891	3334885	3333738	3333962	3334078
3333989					

CONDITION REPORTS / DISPOSITON REPORTS

3317532	2761657	2763326	3321953	3333318	3333126
3333212	3334288	3334689	3333380	3333384	3334682
3334658	3334666	3334679	3334675	3334676	3336549
3334670	3335435	3334720	3334784	3334781	3334780
3334786	3334681	3334806	3336529	3336531	3336533
3334824	3335109	3335107			

WORK ORDERS

3316972	3317291	3128064
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MISCELLANEOUS

Exelon Power Labs Project Number APS-44631, May 14, 2009

UFSAR Section 9.5.4.2.1, Diesel Generator Fuel Oil Storage Tanks, June 2007

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

Procedures

Number	Title	Revision
40ST-9ZZ05	Weekly Electrical Distribution Checks	13
40ST-9ZZ20	Remote Shutdown Disconnect Switch and Control Circuit Operability	16

PALO VERDE ACTION REQUESTS

3327869 3129077 3099500 3076744

CONDITION REPORTS / DISPOSITON REPORTS

3101582 3064675 3078032 3351389 3351396

MISCELLANEOUS

LER 05000529/2009-001-00, dated July 21, 2009
LER 05000528;529;530/2009-003-00 dated July 13, 2009
LER 05000528;529;530/2008-001-00 dated April 1, 2008
LER 05000528/2007-007-00, dated January 22, 2008
LER 05000528/2007-006-00, dated December 21, 2007