Palo Verde 2
4Q/2009 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance: G Sep 30, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Correct a Condition Adverse to Quality with the Emergency Diesel Generator Train B Fuel Oil Transfer Pump in a Timely Manner
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

Inspection Report# : 2009004 *(pdf)*

Significance: G Sep 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Ineffective Corrective Actions for Vaults Containing Station Blackout Cables
The team identified a noncited violation of very low safety significance for failure to effectively implement the corrective action requirements of Regulatory Guide 1.155, "Station Blackout," Appendix A, Criterion 8, "Corrective Action," which were adopted by the licensee in order to meet 10 CFR 50.63, "Loss of All Alternating Current." Although the licensee started a vault monitoring program for water intrusion in vaults with electrical cables in 2003, the effort to prevent exposure of medium voltage cables to submerged conditions has been ineffective for certain vaults that contain the 15kV station blackout generator output cables. Additionally, there are 27 splices in these cables which have contributed to cable test failures in previous meggar resistance tests that, in some cases, required splice replacement in order to pass resistance tests. The licensee entered this issue into their corrective action program as Palo Verde Action Requests 3350712, 3350713, 3350939, and 3352858.

This finding is more than minor because it is associated with the design control and equipment performance attribute

of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The risk significance of this finding was determined using Inspection Manual Chapter 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings.” The finding is of very low safety significance (Green) since the finding did not result in a loss of operability, 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 an actual loss of safety function for greater than 24 hours and the finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding was reviewed for crosscutting aspects and none were identified.

Inspection Report# : 2009008 *(pdf)*

Significance: G Sep 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Perform an Adequate Operability Evaluation for the Condensate Storage Tank
The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the failure to perform an adequate operability evaluation for the condensate storage tank as required by site procedures. Specifically, upon discovery of the condition, the licensee performed an immediate operability determination evaluation based on concerns with the capability of the loop seal to provide protection from vacuum conditions. Subsequently, the licensee performed additional assessments of their overall program which included the specified operability evaluation in a component design bases review and closure of a confirmatory action letter and failed to identify the inadequacy. During the inspection, the team reviewed the operability determination and identified that the licensee failed to consider or identify concerns with the ability of the condensate storage tank pressure relief valves to operate after a design basis earthquake. The licensee entered this issue into their corrective action program as Palo Verde Action Request 3353683.

This finding is more than minor because it is associated with the protection against external events (seismic) attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The risk significance of this finding was determined using Inspection Manual Chapter 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings.” The finding is of very low safety significance (Green) since the finding did not result in a loss of operability, 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 an actual loss of safety function for greater than 24 hours and the finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program since the licensee failed to properly evaluate for operability.

Inspection Report# : 2009008 *(pdf)*

Significance: G Sep 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Incorporate Vendor Information for Reactor Trip Breakers
The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” with programmatic implications for the licensee's failure to follow site procedures and incorporate updated vendor information for the reactor trip breakers. Specifically, the licensee failed to incorporate an updated revision of the maintenance program manual and at least two technical bulletins from the reactor trip breaker vendor. The licensee entered this issue into their corrective action program as Palo Verde Action Requests 3354252 and 3355082.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The risk significance of this finding was determined using Inspection Manual Chapter 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings.” The finding is of very low safety significance (Green) since the finding did not result in

a loss of operability, 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 an actual loss of safety function for greater than 24 hours and the finding did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with operating experience since the licensee failed to implement changes to station processes, procedures, equipment, and training programs.

Inspection Report# : 2009008 *(pdf)*

Significance: G Jun 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Develop an Adequate Procedure to Ensure Operability of the Essential Cooling Water Heat Exchangers
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)].

Inspection Report# : 2009003 *(pdf)*

Significance: SL-IV Jun 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Perform Written Safety Evaluation in Accordance with 10 CFR 50.59 for Refueling Water Tank Full Flow Recirculation
The inspectors identified a non-cited 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 obtained 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 ICCDP 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.
Inspection Report# : 2009003 *(pdf)*

Significance: G Mar 31, 2009
Identified By: NRC
Item Type: FIN Finding
Failure to Correct Deficient Condition for the Essential Spray Pond Chemical Addition System Valves High Failure Rate
The inspectors identified a finding for the failure of engineering and maintenance personnel to adequately implement timely corrective actions for deficiencies associated with the essential spray pond sodium hypochlorite chemical addition system. Specifically, between May 2006 and March 2009, corrective actions to replace degraded sodium hypochlorite valves with a more reliable chemical addition system were not taken resulting in the Unit 2 spray pond Train A chemistry pH level being out of specification high on two occasions. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3277070.

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 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 the licensee did not communicate bases for decisions to personnel with a need to know such that work is performed safely in a timely manner [H.1(c)].

Inspection Report# : 2009002 *(pdf)*

Significance: G Mar 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Perform an Adequate Operability Determination for High Chlorine in the Essential Spray Pond
The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of operations personnel to follow procedures to declare the essential spray pond inoperable. Specifically, on November 13, 2008, operations personnel failed to follow procedures to declare Unit 2 essential spray Pond A inoperable and perform a 10 CFR 50.59 screening when a compensatory measure, such as acid addition, was required to restore operability of the spray pond. This resulted in the performance of a calculation and an evaporative test to verify operability of essential spray Pond A for the mission time without taking credit for compensatory measures. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3258988.

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 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 safety-significant decisions were not verified to validate underlying assumptions and identify unintended consequences [H.1(b)].
Inspection Report# : 2009002 *(pdf)*

Significance: G Mar 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Periodically Inspect or Test, and Repair Fire Penetration Seals
The inspectors identified 5 examples of a non-cited violation of License Condition 2.C.(7), 2.C.(6), and 2.F for Unit 1, Unit 2, and Unit 3, respectively, for the failure of engineering and maintenance personnel to follow procedures to adequately inspect and repair fire penetration seals. Specifically, between 2004 and August 2008, engineering and maintenance personnel failed to inspect and repair fire penetration seals, which provide protection to safety-related equipment during fire events, resulting in the licensee declaring 4 fire penetration seals degraded and 1 non-functional. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3295124.

The finding is more than minor because it was associated with the external factors attribute (i.e. fire) of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability and 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 additional evaluation under Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process." Based on the analysis performed, the inspector concluded that the degradation of the fire barrier penetration seals represented a low degradation of the fire confinement element of the fire protection program, the degraded fire barrier penetration seals had no credible fire damage state, and that the fire ignition sources present could not damage the post-fire safe shutdown equipment, and therefore determined the finding to have very low safety significance. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to implement the corrective action program with a low threshold for identifying issues [P.1 (a)].

Inspection Report# : 2009002 *(pdf)*

Significance: G Feb 27, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Identify and Correct Age-Related Degradation of Safety-Related Inverters
The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to promptly identify and correct a condition adverse to quality. Specifically, the licensee failed to incorporate industry and vendor recommended preventative maintenance requirements to prevent the age related degradation of safety-related inverter components. This finding was entered into the licensees corrective action program as Palo Verde Action Request 3291971.

The inspectors determined that the failure to identify the necessary maintenance practices and take corrective actions prior to the 2008 inverter failures was a performance deficiency. This finding is more than minor because it affects the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, the team determined that a Phase 2 analysis was required because the finding represented a loss of system safety function. A Phase 2/Phase 3 significance

determination was performed by an NRC senior reactor analyst. Based on a bounding analysis, the analyst determined that the delta core damage frequency result was less than 1.0E-7/yr. This noncited violation was therefore determined to be of very low safety significance. This finding has a crosscutting aspect in the problem identification and resolution component of operating experience, in that the licensee failed to implement operating experience through changes to station procedures [P.2(b)].

Inspection Report# : 2009006 *(pdf)*

Significance: G Feb 27, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Properly Implement Corrective Action Process for Potential Operability Issues with the Safety Related Systems and Systems Important to Safety
The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of operations personnel to follow the corrective action program to ensure that degraded and nonconforming conditions associated with safety related systems and systems important to safety were properly reviewed for operability. Specifically, between December 21, 2006, and January 30, 2009, operations personnel failed to perform adequate operability determinations of Palo Verde Action Requests associated with the component design basis review project and other site projects, resulting in 97 Palo Verde Action Requests that either needed an immediate operability determination or a functional assessment, or needed more information to provide reasonable assurance of operability. Of the 97 examples 20 occurred following implementation of corrective actions associated with the Confirmatory Action Letter to improve this process and therefore are reflective of current performance. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3281099.

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 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 problem identification and resolution associated with the corrective action program because 9 of the 20 examples, reflective of current performance, were not thoroughly evaluated such that the resolutions address causes and extent of conditions, as necessary, including properly evaluating for operability conditions adverse to quality [P.1(c)].

Inspection Report# : 2009006 *(pdf)*

Significance: G Feb 27, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Procedures for Performing Operability Determinations
The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for the failure of operations personnel to follow the corrective action program to ensure that degraded and nonconforming conditions associated with safety related systems and systems important to safety were reviewed for operability. Specifically, between December 21, 2006 and January 30, 2009, operations personnel failed to perform adequate operability determinations of Palo Verde Action Requests associated with the component design basis review project and other site projects, resulting in 97 Palo Verde Action Requests that either needed an immediate operability determination or a functional assessment, or needed more information to provide reasonable assurance of operability. Of the 97 examples 20 occurred following implementation of corrective actions to improve this process and therefore are reflective of current performance. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3281099.

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 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 resources because 11 of the 20 examples, reflective of current performance, were the result of inadequate procedural guidance governing the conduct of operability determinations to ensure that conditions adverse to quality are properly evaluated for their potential operability impacts [H.2(c)].

Inspection Report# : 2009006 *(pdf)*

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

Last modified : March 01, 2010