

# Palo Verde 3

## 1Q/2011 Plant Inspection Findings

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### Initiating Events

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: FIN Finding

#### **Downpower Due to High Condenser Hotwell Sodium Levels**

DRAFT:

The inspectors identified a self-revealing finding after Palo Verde Nuclear Generating Station failed to provide adequate work instructions and procedures for main condenser tube sheet coatings in Unit 3. As a result, a degraded tube was not replugged following coating and failed on January 15, 2011, resulting in high sodium levels in the condensate system. Operators entered the abnormal operating procedures for condenser tube rupture and reduced power to 40 percent power to facilitate troubleshooting and repairs. The licensee concluded that Work Order 3384533 and Procedure 31MT-9ZZ19, "Tube Plugging of Secondary Heat Transfer Components," did not provide adequate instructions for the removal, accountability, and reinstallation of permanent plugs during maintenance. The licensee completed repairs to the main condenser and returned Unit 3 to full power. The licensee entered the performance deficiency into the corrective action program as Palo Verde Action Request 3580739 and implemented immediate corrective actions to revise the pre-job brief checklist and maintenance work instructions for condenser tube plugging. The licensee has not completed all corrective actions for this issue.

The inspectors determined that the performance deficiency is more than minor because it affected the equipment reliability attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Attachment 4 of Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Management Significance Determination Process," the inspectors concluded that the finding is of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area human performance associated with the work practices component because the licensee failed to adequately communicate and implement human error prevention techniques, such as self and peer checking that could have ensured the degraded tube was replugged prior to plant operatio.

Inspection Report# : [2011002](#) (*pdf*)

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### Mitigating Systems

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Follow Corrective Action Program Procedure**

DRAFT:

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," after the licensee failed to promptly evaluate a nonconforming condition for operability as required by Procedure 01PR-0AP04, "Corrective Action Program." On November 23, 2010, the licensee completed an apparent cause evaluation for a failure of the Unit 3 "B" spent fuel pool cooling pump and concluded the cause of the failure was a misalignment by the vendor of the bell alarm bracket within the K-600S 480 VAC Class 1E circuit breaker. On December 7, 2010, the extent of condition review identified 76 breakers installed in the three units that could be susceptible to the same failure mechanism. On January 28, 2011, control room operators completed an immediate operability determination for the nonconforming condition and concluded the affected systems, structures, and

components remained capable of performing their safety functions. The inspectors concluded that the licensee failed to follow Procedure 01PR-0AP04, "Corrective Action Program," Step 3.2.1.5, which states "Operability shall be determined immediately upon discovery that an SSC subject to technical specification or that supports SSCs subject to technical specification is in a degraded or nonconforming condition." The licensee entered the performance deficiency into the corrective action program as Palo Verde Action Request 3587124 and has not completed corrective actions for this issue.

The inspectors concluded that the failure of the licensee personnel to promptly evaluate nonconforming conditions for the effect on operability, in accordance with Procedure 01PR-0AP04, was a performance deficiency. The finding is more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors used Inspection Manual Chapter 609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," to analyze the finding and concluded it was of very low safety significance (Green) because it did not represent a loss of system safety function, represent actual loss of safety function of a single train for greater than its technical specification allowed outage time, represent an actual loss of safety function of one or more non-technical specification trains of equipment designated as risk-significant per 10 CFR 50.65 for greater than 24 hours, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors concluded that this finding had a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee failed to adequately evaluate the condition adverse to quality and identify that affected plant equipment needed to be evaluated for operability.

Inspection Report# : [2011002](#) (pdf)

**Significance: SL-IV** Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Perform a 10 CFR Part 21 Evaluation**

DRAFT:

The inspectors identified a Severity Level IV noncited violation of 10 CFR Part 21 after Palo Verde Nuclear Generating Station failed to evaluate an identified deviation within 60 days of discovery to determine if there is a substantial safety hazard. On November 23, 2010, the licensee completed an apparent cause evaluation for a failure of the Unit 3 "B" spent fuel pool cooling pump and concluded the cause of the failure was a misalignment by the vendor of the bell alarm bracket within the K-600S 480 VAC Class 1E circuit breaker. Additionally, the apparent cause evaluation identified similar failures of the same type of breaker dating back to April 29, 2009. The inspectors questioned whether the licensee should have performed an evaluation in accordance with 10 CFR Part 21 to determine if a defect existed. On February 15, 2011, the licensee completed an evaluation of prior deviations related to the alignment of bell alarm switches and concluded the deviations were defects that were reportable per 10 CFR Part 21. The licensee subsequently submitted Part 21 report 2011-07-00 on February 24, 2011. Additionally, the licensee completed an operability determination for the potentially affected breakers currently installed in the units and concluded that the equipment continued to be able to perform their respective safety functions. The licensee entered the performance deficiency into the corrective action program as Palo Verde Action Request 3593672 and has not completed corrective actions for this issue.

The inspectors evaluated this violation using the traditional enforcement process because the failure to submit a required report affected the NRC's ability to perform its regulatory function. Consistent with the guidance in Section IV.A.3 and Supplement I, Paragraph D.4, of the NRC Enforcement Policy, the inspectors concluded the violation was a Severity Level IV because the licensee failed to make a timely written report. The inspectors also concluded that the violation was a finding under the Reactor Oversight Process because the failure of licensee personnel to follow station procedures was a performance deficiency. The inspectors concluded that the finding is more than minor because the failure to follow procedures could reasonably be seen to lead to a more significant safety concern. The inspectors concluded that the finding had very low safety significance because the failure to follow procedures did not result in an actual loss of a system safety function or equipment required by technical specifications, or involve the loss or degradation of equipment specifically designed to mitigate a seismic, flooding, or severe weather initiating event, and did not involve the total loss of any safety function that contributes to an external event initiated core damage accident sequence. The inspectors concluded that this finding had a crosscutting aspect in the area of human performance associated with the resources component because licensee processes and procedures did not provide adequate instructions on identifying and evaluating defects for reportability.

**Significance:**  Nov 15, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Promptly Correct a Condition Adverse to Quality for the Essential Cooling Water Room Cooler**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure of engineering personnel to promptly correct a condition adverse to quality associated with room cooler AHU-3MHAAZ05 blower shaft dimensions. Specifically, between July 2008 and November 2010, corrective actions for high vibrations in the Unit 3 essential cooling water system train A room cooler blower failed to promptly address the incorrect shaft dimensions at the bearing shaft interface. The licensee is developing corrective actions to replace the defective shaft by procuring a new shaft or machining a shaft on site. The licensee entered this issue into the corrective action program as Palo Verde Action Request 3559219.

The inspectors concluded the finding was more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone, and affected the cornerstone objective to ensure the availability, reliability, 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 inspectors determined the finding had a very low safety significance (Green) because the finding did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined this finding had a crosscutting aspect in the area of human performance associated with the resources component because the licensee failed to ensure that personnel, equipment, and procedure were available and adequate to assure nuclear safety by minimizing long standing equipment issues.

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Work Instruction to Replace Emergency Diesel Generator Starting Air Turning Gear Interlock Valves**

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for the failure of maintenance personnel to adequately establish and implement work order instructions associated with the emergency diesel generators starting air turning gear interlock valves. Specifically, on May 13, 2010, Unit 3 emergency diesel generator train B failed to start within its technical specification allowed time due to the turning gear interlock valve 3JDGBUV0234 being improperly positioned during installation. The turning gear interlock valve was replaced and the engine was started and verified to meet all acceptance criteria. Work orders were revised to reflect plunger depression requirements. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3475479.

The performance deficiency was more than minor, and is therefore a finding, because it affected the procedure quality attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective to ensure the availability, reliability, 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 was determined to have a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because the licensee failed to institutionalize operating experience through changes to station processes, procedures, equipment, and training programs.

Inspection Report# : [2010004](#) (pdf)

**Significance:**  Sep 30, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Unqualified Coatings in Containment**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V,” Instructions, Procedures, and Drawings,” for an inadequate procedure for the application of coatings in containment. Specifically, during construction, Specification 13-AM-314, “Installation Specification for Surface Coating Systems for Concrete,” improperly required a dry-film thickness of 2 to 5 mils for Mobil/Valspar 84-V-200, which is beyond the limits of 2 to 5 mils wet-film thickness that was allowed by the vendor instructions. Mobil/Valspar 84-V-200 was found to lack design basis testing and subsequent testing demonstrated that 50 percent of the coating in excess of 2 mils thickness failed as particulate, rather than chips, which increases debris loading on the containment sump. The licensee plans to revise calculation N001-1106-00002, “Debris Generation Due to LOCA within Containment for Resolution of GSI-191,” to incorporate the added debris loading from the unqualified coatings as a corrective action. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3469133.

The performance deficiency was more than minor, and is therefore a finding, because it affected the design control attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective of ensuring the reliability 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 was evaluated as not having a crosscutting aspect because the performance deficiency is not reflective of current performance.

Inspection Report# : [2010004](#) (pdf)

**Significance:**  Sep 10, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Maintain Operator Licensing Examination Integrity**

The inspectors identified a noncited violation of 10 CFR 55.49, “Integrity of Examinations and Tests,” for the failure of the licensee to ensure that the integrity of an operating test administered to licensed operators was maintained. During the week of December 8, 2009, twenty-four licensed operators received three job performance measures and one additional licensed operator received five job performance measures for their operating tests that had been previously administered to other licensed operators in previous weeks. This failure resulted in a compromise of examination integrity because it exceeded the 50 percent overlap required by quality procedure LOCT-TPD-R56, “Licensed Operator Continuing Training Program,” Revision 56, for this portion of the examination, but did not lead to an actual effect on the equitable and consistent administration of the examination. This issue was entered into the licensee’s corrective action program as Condition Report Disposition Request 3527071.

The failure of the licensee’s training staff to maintain the integrity of examinations administered to licensed operations personnel was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it adversely impacted the human performance attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, the performance deficiency could have become more significant in that allowing licensed operators to return to the control room without valid demonstration of appropriate knowledge on the biennial examinations could be a precursor to a more significant event. Using Manual Chapter 0609, “Significance Determination Process,” Phase 1 worksheets, and the corresponding Appendix I, “Licensed Operator Requalification Significance Determination Process,” the finding was determined to have very low safety significance (Green) because, although the finding resulted in a compromise of the integrity of operating test job performance measures and compensatory actions were not immediately taken when the compromise should have been discovered in 2009, the equitable and consistent administration of the test was not actually impacted by this compromise. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee failed to ensure that procedures were accurately translated from industry standards such that the 50 percent maximum overlap was not exceeded.

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Sep 09, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Follow Procedures for Medical Examinations of Licensed Operators**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of the licensee to follow their quality procedure 01DP-0EM13, "Licensed Operator Medical Examinations," Revision, which provides the medical examination requirements for licensed operators at Palo Verde Nuclear Generating Station. Of the 15 medical records reviewed by the inspectors, 7 licensed senior reactor operator medical records did not contain the proper no-solo restrictions imposed by the NRC when these individuals were licensed. Additionally, the software that the licensee used to track these restrictions (Station Work Management System or SWMS) did not reflect the proper restrictions for these 7 individuals. This issue was entered into the licensee's corrective action program as Condition Report Disposition Requests 3527072 and 3526979.

The failure of the licensee's medical staff to follow their procedure for implementing the required medical examination program was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it adversely impacted the human performance attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance and is being characterized as a Green, noncited violation. The finding was determined to be Green, using Appendix I of Manual Chapter 0609, because more than 20 percent of the medical records reviewed contained significant deficiencies. The finding was also determined to have very low safety significance (Green) because: (1) the finding did not result in any events in the control room; and (2) no health requirements required by ANS/ANSI 3.4-1983 "Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants" were exceeded by any licensed operator while on watch. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because this procedure and its associated software are the two principle mechanisms that the facility uses to ensure that licensed operators are fit for duty.

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Aug 21, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Promptly Identify and Correct a Condition Adverse to Quality for Foreign Material in the Pneumatic Supply Lines to the Atmospheric Dump Valves Actuators**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure of engineering personnel to promptly identify and correct a condition adverse to quality associated with foreign material in the nitrogen and instrument air supply to the atmospheric dump valve. Specifically, between July 2009 and August 2010, corrective actions to address foreign material in the Unit 3 instrument air supply to atmospheric dump valve ADV-185 failed to promptly identify and remove similar debris in remaining instrument air or nitrogen supply lines. The licensee is developing new work orders to flush and inspect pneumatic supply lines to the atmospheric dump valves. This issue was entered into the licensee's corrective action program as Palo Verde Action Request 3531638.

The performance deficiency was more than minor, and is therefore a finding, because it affected the equipment reliability attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective to ensure the availability, reliability, 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 was determined to have a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to conduct effectiveness reviews of safety significant decisions to verify the validity of assumptions, identify possible unintended consequences, and determine how to improve future decisions.

Inspection Report# : [2010004](#) (pdf)

**Significance: SL-IV** Sep 09, 2000

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Ensure All License Conditions Are Met for Licensed Operators**

The inspectors identified a Severity Level IV violation of 10 CFR 55.3, "License Requirements," for the failure of the licensee to ensure that all individuals authorized by a license to operate the controls of the facility met all the conditions of their licenses as defined in 10 CFR 55.3. Specifically, the requirement to have a biennial physical completed and certified by the facility's physician during the continuous two year period for all licensed operators was not met for three licensed operators. Two of these licensed operators performed licensed operator duties 42 times between February 8 and March 25, 2010, after the deadline for their biennial examinations had passed. Upon discovery, the licensee removed these individuals from watchstanding duties pending follow-up medical evaluations. This issue was entered into the licensee's corrective action program as Condition Report Disposition Request 3526981.

The failure of the licensee to ensure that all individuals authorized by a license to operate the controls of the facility met all the conditions of their licenses as defined in 10 CFR 55.3 is a performance deficiency. Specifically, the requirement to have a biennial physical completed and certified by the facility's physician during the continuous two year period for all licensed operators (as required in 10 CFR 55.21) was not met for three licensed operators, two of which were standing watch with expired medical examinations. The finding was evaluated using the traditional enforcement process because the failure to determine an operator's medical condition and general health has the potential to impact the NRC's ability to perform its regulatory function; the NRC was not notified nor allowed an opportunity to review the specific medical conditions of the two operators whose medical qualifications had expired while they were standing watch or eligible to stand watch. Using the NRC's Enforcement Policy, section 6.4.d, Severity Level IV violation examples, this finding is similar to example 1 which states, in part that "an unqualified individual performing the functions of an operator or senior operator." Two licensed operators stood watch without a certified medical examination within the two year period that the medical examination is required to be completed and certified by the physician. Because: (1) the medical conditions of the two licensed operators did not change when they received their medical examinations in recent weeks; (2) the finding did not cause any plant events or transients while the individuals were on watch; (3) it was not repetitive or willful; and (4) it was entered into the corrective action program, the finding was determined to be of very low safety significance and is being treated as a Severity Level IV noncited violation consistent with the NRC Enforcement Policy. This finding has a crosscutting aspect in the area of human performance associated with the work practices component because medical staff supervisors did not oversee the biennial physical examination due dates such that nuclear safety was supported.

Inspection Report# : [2010005](#) (*pdf*)

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## **Barrier Integrity**

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## **Emergency Preparedness**

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## **Occupational Radiation Safety**

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## **Public Radiation Safety**

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## **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.

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## Miscellaneous

**Significance:** N/A Dec 17, 2010

Identified By: NRC

Item Type: FIN Finding

### **Palo Verde Nuclear Generating Station Biennial PI&R Inspection Summary**

The team concluded that the corrective action program at Palo Verde Nuclear Generating Station was generally effective. The team concluded that site personnel identify problems at a low threshold and enter them into the corrective action program. The licensee utilizes a rigorous screening process to characterize issues and that the vast majority of issues are appropriately evaluated and adequate corrective actions are taken. The team did identify isolated cases where problem evaluation could have been more effective at addressing the underlying causes of issues as well as a number of examples where corrective actions were not timely or adequate to address identified problems. The team also determined that though the overall process for identifying and correcting issues was well established, certain incidents of procedural violations associated with corrective action program processes led to delays and less than adequate actions to correct material deficiencies. Though the team identified areas in which the licensee could improve their corrective action program, the overall process was determined to be effective in identifying and correcting conditions adverse to quality.

The licensee appropriately evaluated industry operating experience for relevance to the facility, entered applicable items in the corrective action program, and subsequently utilized OE in root cause and apparent cause evaluations. The team did determine that that the licensee could improve its utilization of OE to prevent the occurrence of similar events at Palo Verde. The team determined that the licensee performed very effective quality assurance audits and self assessments.

The team performed 7 safety culture focus group discussions involving approximately 70 licensee personnel in order to assess the safety conscious work environment of the site. The team felt that most of the work groups interviewed had a strong safety conscious work environment; however, 3 of the 7 work groups interviewed exhibited weaknesses in safety culture. Specifically, the team found that although there were many individuals who felt comfortable raising safety concerns without fear of retaliation, there were some individuals in the operations department who expressed the perception that they would or might be retaliated against for raising certain safety concerns.

Inspection Report# : [2010008](#) (*pdf*)

Last modified : June 07, 2011