

Palo Verde 1

4Q/2016 Plant Inspection Findings

Initiating Events

Significance: G Sep 28, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Follow Advance Work Authorization Procedure

The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” because the licensee failed to accomplish activities affecting quality in accordance with documented procedures. Specifically, the inspectors identified multiple examples of design changes performed under the Advanced Work Authorization process which were placed into service prior to the completion of the associated engineering work orders. As an immediate corrective action, the licensee instituted a requirement for the design engineering director to approve all Advance Work Authorizations to ensure the in service point is clearly identified and understood. The licensee entered this issue into the corrective action program as Condition Report 16-09965.

The failure to establish adequate constraints to ensure that final engineering approval of advance work is completed prior to placing modified systems in service was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, routinely failing to implement the requirements of the engineering design change advance work authorization process could result in equipment being placed in service without an approved design configuration. In accordance with Inspection Manual Chapter 0609, Significance Determination Process, Attachment 4, “Initial Characterization of Findings,” dated June 19, 2012, Table 2, reactor coolant system boundary issues are considered under the Initiating Event Cornerstone. Using Table 3, the inspectors determined the finding pertained to an event or degraded condition while the plant was shutdown and, therefore, used Inspection Manual Chapter 0609, Appendix G “Shutdown Operations Significance Determination Process,” dated May 9, 2014, for significance determination. The inspectors reviewed Appendix G, Attachment 1, Exhibit 2, “Initiating Events Screening Questions.” The inspectors answered “No” to Question A.1, and found all other questions to be not applicable and therefore concluded that the finding was of very low safety significance (Green). The inspectors determined that this finding had a human performance crosscutting aspect associated with work management, because the licensee did not coordinate with all affected work groups so that operations personnel understood the constraints prior to placing the modified system back in service.

Inspection Report# : [2016003](#) (*pdf*)

Significance: G Jan 15, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Loop Flow Test Procedure

The team identified a Green non-cited violation of License Conditions 2.C.7, 2.C.6, and 2.F for Units 1, 2, and 3, respectively, because the licensee had not established criteria for determining when a fire main loop had degraded and had not properly tested all portions of the fire main loop. Specifically, the licensee had not established a differential pressure that would initiate actions to evaluate the cause for a degradation and the licensee had not determined the flow through individual flow paths in their auxiliary and control buildings. The licensee documented these issues in Condition Reports 15 00513 and 16 00686 and initiated actions to correct the procedure and perform the flow test of

the individual loops.

The team identified a performance deficiency related to the procedure used to test their fire main loop. Specifically, the licensee had not established criteria for determining a degraded fire main loop and had not properly tested all portions of the fire main loop. This performance deficiency was more than minor because it was associated with the protection against external factors attribute (fire) and adversely affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to test the fire main loops inside the control/auxiliary building separately and failure to establish appropriate acceptance criteria affected the ability to demonstrate the continued capability to deliver adequate flow and pressure to the fire suppression systems.

The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," dated June 19, 2012. The inspectors determined that an IMC 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, review was required as the finding affected the ability to reach and maintain safe shutdown conditions in case of a fire. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," dated September 20, 2013, the finding was screened as a Green finding of very low safety significance in accordance with Task 1.4.7, "Fire Water Supply," Question A. The inspectors determined that although the licensee failed to test portions of the fire main system in accordance with code requirements, the inspectors determined that at least 50 percent of required fire water capacity would be available based on the testing is done with only one fire pump in service and there are three available fire pumps. Since these fire main loops inside the control/auxiliary building had not been monitored for pressure changes when flow tested since initial testing and nothing caused the licensee to reevaluate the test, the team determined that this failure did not reflect current performance.

Inspection Report# : [2015008](#) (pdf)

Mitigating Systems

Significance:  Sep 01, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Establish Maintenance Activities and Instructions for Gas Turbine Generator Station Blackout Batteries

The team identified a Green, non-cited violation of 10 CFR 50.63, "Loss of All Alternating Current," which states, in part, "The alternate AC power source, as defined in 10 CFR 50.2, will constitute acceptable capability to withstand station blackout provided an analysis is performed which demonstrates that the plant has this capability from onset of the station blackout until the alternate AC source(s) and required shutdown equipment are started and lined up to operate." Specifically, prior to August 5, 2016, the licensee replaced the gas turbine generator station blackout batteries in a modification to address obsolete components, but failed to identify the initial parameters to baseline the batteries and failed to implement a battery testing and maintenance program. In response to this issue, the licensee determined that the batteries continued to satisfy their design function and began to develop the necessary testing and preventive maintenance procedures. This finding was entered into the licensee's corrective action program as Condition Report 14-02346.

The team determined that failure to implement preventative maintenance activities for the gas turbine generator station blackout batteries since their replacement in 2014 was a performance deficiency. This performance deficiency was more than minor because it was 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. Specifically, the licensee replaced the gas turbine generator station blackout batteries in a modification to address obsolete components, but failed to identify the initial parameters to baseline the batteries and failed to implement a battery testing and maintenance program. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency that did not result in a loss of operability or functionality; did not represent an actual loss of safety function of a system or train; did not result in the loss of a single train for greater than technical specification allowed outage time; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a crosscutting aspect in the area of problem identification and resolution associated with resolution because the licensee failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance [P.3].

Inspection Report# : [2016007](#) (pdf)

Significance:  Sep 01, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Translate Information from Design Modification into Design Documentation, Operating Procedures, and Operator Training

. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” which states, in part, “measures shall be established to assure that applicable regulatory requirements and the design basis, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.” Specifically, prior to August 5, 2016, the licensee did not adequately implement operator training and annunciator response procedures for Design Modification 216914, which resulted in the failure to adequately evaluate the impact on operability for the loss of forced cooling capability for the L31 load center transformer. In response to this issue, the licensee confirmed that the L31 load center was operable, but degraded, based on the remaining life for the transformer insulation when considering the maximum design basis accident load on the transformer and the expected load duration with the cooling fans disabled. This finding was entered into the licensee’s corrective action program as Condition Report 3-16-12571 and Condition Report 3-16-13316.

The team determined that the failure to adequately update design documentation, operating procedures, and operator training was a performance deficiency. This performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to update appropriate design calculations, annunciator response procedures, and licensed operator training when Design Modification 216904 was implemented in 1996 contributed to conditions that resulted in Operations preparing an inadequate Immediate Operability Determination when the L31 transformer cooling equipment failed on April 21, 2015. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency that did not result in the loss of operability or functionality; did not represent an actual loss of safety function of a system or train; did not result in the loss of a single train for greater than technical specification allowed outage time; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2016007](#) (pdf)

Significance: G Sep 01, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Verify the Ability to Isolate the Safety-Related Condensate Storage Tank from Non-Safety Piping

The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Specifically, prior to August 3, 2016, the licensee failed to establish measures to assure an adequate water level was maintained in the condensate storage tank, failed to establish a time critical action to isolate the condensate storage tank, and failed to establish specific procedures to isolate the condensate storage tank in the event of a tornado. In response to this issue, the licensee initiated the process to revise plant procedures and evaluate associated operator time critical actions. This finding was entered into the licensee's corrective action program as Condition Reports 16-13761, 16-12430, and 16 13762.

The team determined that failure to verify the ability to isolate the safety-related condensate storage tank from the non-safety portion of the auxiliary feedwater system while preserving enough tank capacity to safely shutdown was a performance deficiency. This performance deficiency was more than minor because it was 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. Specifically, the licensee's failure to ensure timely isolation of the condensate storage tank would adversely affect the capability to safely shutdown the plant using the condensate storage tank and safety-related auxiliary feedwater system. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency that did not result in a loss of operability or functionality; did not represent an actual loss of safety function of a system or train; did not result in the loss of a single train for greater than technical specification allowed outage time; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2016007](#) (*pdf*)

Significance: G Sep 01, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Pipe Welds Not Incorporated into the Inservice Inspection Program

The team identified a Green, non-cited violation of 10 CFR 50.55a(g)4, "Inservice Inspection Standards Requirement for Operating Plants," which states, in part, "Throughout the service life of a pressurized water-cooled nuclear power facility, components that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements set forth in Section XI of the ASME Code." The ASME Code, Section XI, Article IWA-2610, requires that a reference system be established for all welds and areas subject to a surface or volumetric examination. Specifically, prior to August 8, 2016, for two welds located in an ASME Code, Section XI, Class 3, suction line between the condensate storage tank and the non-safety-related auxiliary feedwater pump, a weld reference system was not established. In response to this issue, the licensee reclassified the subject welds and scheduled weld examinations to ensure potential cracks would be detected. This finding was entered into the licensee's corrective action program as Condition Report 16-13150.

The team determined that the licensee's failure to establish a weld reference system for two welds in the suction line between the condensate storage tank and the startup feed pump system was contrary to the ASME Code, Section XI, Article IWA-2610, and was a performance deficiency. This performance deficiency was more than minor because the

finding, if left uncorrected, would become a more significant safety concern. Specifically, absent NRC identification, the licensee would not have examined these welds, which could have allowed service induced cracks to go undetected. Undetected cracks would place the suction pipe segment at increased risk for through-wall leakage and/or failure, which would affect the safety of an operating reactor. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to have very low safety significance (Green) because it was a design or qualification deficiency that did not result in the loss of operability of functionality; did not represent an actual loss of safety function of a system or train; did not result in the loss of a single train for greater than technical specification allowed outage time; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2016007](#) (*pdf*)

Significance:  Mar 24, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Operations Department Failure to Document Conditions Adverse to Quality in Condition Reports

The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to document conditions adverse to quality in the corrective action program. Previous similar failures to initiate condition reports led to, or contributed to, two significant conditions adverse to quality over the last 15 months.

The failure of the operations department to document identified conditions adverse to quality in condition reports, as required by Procedure 01DP-0AP12, "Condition Reporting Process," Revision 23, was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, on two other occasions since January 2015, failures by operations personnel to write condition reports for equipment-related problems resulted in or contributed to significant conditions adverse to quality. This performance deficiency demonstrated a continued gap within Palo Verde Nuclear Generation Station's operations department in understanding condition report initiation criteria. This performance deficiency is associated with the mitigating systems cornerstone. Using NRC Inspection Manual Chapter 0609, Appendix A, the team determined that this finding was of very low safety significance (Green) because it did not affect the operability or functionality of a mitigating structure, system, or component. This finding has a resolution cross-cutting aspect in the area of problem identification and resolution because the licensee failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance (P.3)

Inspection Report# : [2016008](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Significance:  Apr 20, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Implement High Radiation Area Controls in an Area with a Dose Rates Greater Than 1 rem per hour

The inspectors reviewed a Green, self-revealing, non-cited violation of Technical Specification 5.7.2, which was caused by the licensee's failure to control a high radiation area with radiation levels greater than 1 rem per hour in the Unit 1 containment. A radiation protection technician received an unexpected dose rate alarm while conducting surveys on piping in the 87-foot elevation of the 2B reactor coolant pump bay area near a high efficiency particulate air unit in containment. Licensee personnel corrected the error by guarding the area, posting the area, and changing the pre-filters in the adjacent portable a high efficiency particulate air units to reduce the dose rates. This issue was entered into the licensee's corrective action program as Condition Reports 16-06515 and 16-07479.

The inspectors determined that the failure to identify a locked high radiation area through timely surveys and adequate a high efficiency particulate air maintenance procedures that could have revealed changing radiological conditions was a performance deficiency. The performance deficiency was more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process (exposure control) and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation because licensee personnel did not implement barriers intended to prevent workers from receiving unexpected dose. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined the violation had very low safety significance (Green) because: (1) it was not an as low as is reasonably achievable finding, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. This finding has a cross-cutting aspect in the human performance area, associated with the resources component, because the licensee leaders failed to ensure that personnel, equipment, and procedures were available and adequate to support nuclear safety. Specifically, the licensee failed to ensure that procedures were adequate to ensure radiation levels around portable high efficiency particulate air units were monitored to evaluate changing radiological conditions in a timely manner such that hazards were appropriately controlled [H.1].

Inspection Report# : [2016002](#) (pdf)

Significance:  Apr 20, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Engineering and Radiological Controls Resulting in a Unit 1 Containment Building Airborne Radioactivity Event with Unplanned Intakes

The inspectors identified a non-cited violation of 10 CFR 20.1701 due to the licensee's failure to implement adequate processes and engineering controls necessary to reduce airborne radioactivity and prevent internal dose to workers in Unit 1. On April 20, 2016, inspectors identified that procedures and instructions for monitoring high efficiency particulate air ventilation filter unit to prevent worker exposures to radiation and airborne radioactivity were being inadequately implemented. On April 21, 2016, the licensee's inadequate engineering and radiological controls during a high efficiency particulate air operations caused an airborne radioactivity event in containment, resulting in the evacuation of 41 potentially contaminated workers of whom 8 had measurable intakes of radioactive material. The licensee's immediate corrective actions included stopping work in the Unit 1 containment, evacuating workers in containment, assessing workers for external and internal contamination, and investigating the cause and source of the contamination event. This matter was placed in the licensee's corrective action program as Condition Reports 16-06499 and 16-06578 and the licensee initiated a root cause investigation.

The inspectors determined that the failures to implement adequate engineering and radiological controls to reduce airborne radioactivity during a high efficiency particulate air unit operations in accordance with 10 CFR 20.1701 and radiation protection procedures were performance deficiencies. The performance deficiencies were more than minor because they were associated with the Occupational Radiation Safety Cornerstone attribute of program and process

(exposure control) and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. This was evident by the Unit 1 containment airborne radioactivity event on April 21, 2016, that resulted in at least eight workers with unplanned intakes. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined the finding had very low safety significance (Green) because: (1) it was not an as low as is reasonably achievable planning and controls finding, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. The inspectors concluded that the finding has a cross-cutting aspect in the human performance area, associated with the resources component, because the licensee leaders failed to ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety. Specifically, procedures and radiation exposure permits failed to have adequate instructions for ensuring a high efficiency particulate air filter loading and dose rates were monitored to prevent overloading, and safe handling of loaded a high efficiency particulate air filters [H.1].

Inspection Report# : [2016002](#) (pdf)

Public Radiation Safety

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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Miscellaneous

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