

Palo Verde 2

4Q/2013 Plant Inspection Findings

Initiating Events

Significance: G Dec 31, 2013

Identified By: NRC

Item Type: FIN Finding

Failure to Identify and Correct Adverse Conditions

DRAFT A Green self-revealing finding was identified for the licensee's failure to promptly identify and correct an adverse condition. Specifically, the licensee failed to identify that operating limits for main feedwater pump (MFP) vapor extractors did not prevent lube oil leakage, and insulation surrounding the Unit 2 train A MFP became soaked with oil. As a result, the oil soaked insulation, exposed to hot surface temperatures over time, became degraded and initiated a fire in the turbine building, resulting in declaration of an unusual event. No violation of regulatory requirements occurred because the finding occurred on non-safety secondary plant equipment. The licensee entered the finding into the licensee's corrective action program as Condition Report Disposition Request 4458504 and 4452395.

The failure to promptly identify and correct an adverse condition was a performance deficiency. The performance deficiency is more than minor because it was a precursor to a more significant event which resulted in a fire and an emergency declaration of an Unusual Event. The finding was associated with the Initiating Events Cornerstone. The inspectors assessed the significance of the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, appendix A, "Significance Determination Process for Findings At-Power," using Exhibit 1, "Initiating Events Screening Questions." The finding required a detailed risk evaluation because it resulted in increasing the fire frequency. A Region IV senior reactor analyst performed the detailed risk evaluation. The bounding change to the core damage frequency was 1.0E-7/year (Green). The most prominent core damage sequences included a transient coupled with various failures of the auxiliary feedwater and main feedwater pumps. The automatic runback function of the feedwater control system helped to minimize the change to the core damage frequency. The inspectors determined the finding has a cross-cutting aspect in the area of problem identification and resolution associated with the operating experience (OE) component because the licensee failed to implement and institutionalize OE through changes to station processes, procedures, equipment, and training programs to ensure MFP turbine vapor extractors are operated appropriately and that fire hazards associated with oil soaked insulation are promptly identified and corrected.

Inspection Report# : [2013005](#) (*pdf*)

Significance: G Sep 30, 2013

Identified By: NRC

Item Type: FIN Finding

Failure to Include Requirements in Preventative Maintenance Basis

The inspectors identified a Green finding for the failure of licensee personnel to follow Procedure 30DP-9MP08, "Preventive Maintenance Program." Specifically, plant personnel did not ensure that requirements for performing inspection and replacement of degraded tie-wraps in electrical cubicles were contained in preventative maintenance basis documents. Consequently, degraded cable tie-wraps in Unit 1 load center L02 were not inspected prior to a catastrophic electrical fault on July 2, 2013. The licensee rebuilt the load center cubicle and has entered this issue into

their corrective action program as PVAR 4454845.

The failure to follow established procedures for updating preventive maintenance basis documents with requirements and recommendations from previous component failures was a performance deficiency. This performance deficiency is more than minor because it was associated with the procedure quality attribute of the Initiating Events Cornerstone and adversely affects 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. Specifically, by not including the requirements and recommendations from the history of previous failures in the preventive maintenance basis, pertinent operating experience was not considered when evaluating changes to the preventive maintenance program. Consequently, degraded cable tie-wraps in Unit 1 load center L02 were not inspected prior to experiencing a catastrophic electrical fault on July 2, 2013 that upset plant stability. The inspectors used the NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," to determine the significance. The inspectors determined that the finding was 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. The inspectors also determined the issue had a cross-cutting aspect in the area problem identification and resolution associated with the operating experience component because the licensee did not implement and institutionalize operating experience through changes to the station's preventive maintenance program [P.2(b)].

Inspection Report# : [2013004](#) (*pdf*)

Mitigating Systems

Significance:  Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Modification of Safety Related Accumulators

DRAFT The inspectors identified a green non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the failure to assure that a modification to the main steam and main feedwater isolation valve accumulators was suitable for the reliable operation of these components. Specifically, on September 4, 2009, the licensee failed to assess the suitability of a small dead band for a thermal relief valve in the accumulator valve manifold assembly and the impact to reliable operation of the associated valves. The licensee entered this issue into the corrective action program as Palo Verde Action Request 4429273. The licensee isolated the thermal relief valve from the actuators.

The failure to assure that the modification of the main steam and main feedwater isolation valve accumulators was suitable for the reliable operation of these components was a performance deficiency. The performance deficiency is more than minor because it was associated with the Mitigating Systems Cornerstone attribute of equipment performance and it adversely affect the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of the issue under the Significance Determination Process, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at-Power." Inspectors concluded the finding was of very low safety significance (Green) because all questions in Exhibit 2 could be answered no. The finding had a cross-cutting aspect in the area of human performance associated with resources component because the licensee did not maintain design margins by minimizing long standing equipment issues.

Inspection Report# : [2013005](#) (*pdf*)

Significance: G Jun 30, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Prevent Recurrence of a Significant Condition Adverse to Quality

A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” occurred because the licensee failed to correct and prevent recurrence of a significant condition adverse to quality associated with the emergency diesel generator automatic voltage regulator circuitry. Specifically, from February 2011 to January 2013, the licensee failed to correct the cause of an induced voltage transient in the automatic voltage regulator circuitry, resulting in the Unit 2 train B diesel generator not reaching rated voltage during a surveillance test. The licensee entered the issue into their corrective action program as CRDR 4329997 and replaced and retested electrical components that could allow a voltage transient on the instantaneous pre-positioning circuit board.

The performance deficiency associated with this finding is the failure of the licensee to correct and prevent recurrence of a significant condition adverse to quality. The performance deficiency is more than minor, and therefore a finding, because it is associated with the equipment performance 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. The senior resident inspector performed the initial significance determination for the train B emergency diesel generator (EDG) failure. The inspector evaluated the significance of the issue under the SDP, as defined in Inspection Manual Chapter 0609.04, “Initial Characterization of Findings,” and IMC 0609, Appendix A, “The Significance Determination Process (SDP) for Findings at-Power.” The finding screened to a detailed risk evaluation because it involved a potential loss of one train of safety related equipment for longer than the technical specification allowed outage time. A Region IV senior reactor analyst performed the detailed risk evaluation. The exposure period was 43 days. The change to the CDF was 7.2E-7/year (Green). The finding was not significant to the large early release frequency. The dominant core damage sequences included loss of offsite power events that lead to station blackout conditions. The gas turbine generators, train A emergency diesel generator, and the DC battery life extension to six hours helped to limit the risk. The finding has a cross-cutting aspect in the area of Problem Identification and Resolution associated with the corrective action program component because the licensee failed to thoroughly evaluate problems such that the resolutions address causes and extent of condition, as necessary [P.1(c)].

Inspection Report# : [2013003](#) (*pdf*)

Significance: G Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Multiple Failures to Identify Conditions Adverse to Quality

The inspectors identified two examples of a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI “Corrective Action,” for the failure of the licensee to promptly identify and correct conditions adverse to quality. Specifically, on July 19, 2012, personnel failed to follow Procedure 01DP-0AP12, “Palo Verde Action Request Processing,” and enter into the corrective action process a failure to comply with technical specifications to enter limiting condition for operation 3.0.3 when maintenance activities rendered safety related inverters inoperable. In addition, on May 2, 2011, the licensee also failed to enter an unanalyzed diversion of emergency core cooling system flow into the corrective action process, despite procedural guidance to the contrary. The licensee entered the issues into the corrective action program as Palo Verde Action Request (PVAR) 4347283 and PVAR 4389514 and is assessing corrective actions.

The inspectors concluded that the failure to promptly identify and correct conditions adverse to quality was a performance deficiency. The inspectors determined the performance deficiency is more than minor, and therefore a finding, because it adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone and its objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined the two issues had similar causal factors and should be

documented as one NCV in accordance with NRC enforcement guidance. The inspectors evaluated the significance of each issue under the SDP, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." For the issue associated with inoperable safety related inverters, the inspectors determined the finding to be of very low safety significance (Green) because all questions in Exhibit 2.A could be answered no. For the issue associated with an unanalyzed condition of the high pressure safety injection system, the inspectors determined that the finding represented a loss of system function and needed a detailed evaluation. The inspectors used the Palo Verde Standardized Plant Analysis Risk model, Revision 8.20, with a truncation limit of E-11 and performed a bounding significance determination and found the finding to be of very low safety significance (Green). The bounding change to the core damage frequency was 2.4E-9/year. The dominant core damage sequences included: medium break loss of coolant accident, system transient, and steam generator tube rupture. The very short exposure period minimized the significance. A Region IV senior reactor analyst reviewed the results and agreed with the conclusions. This finding has a cross-cutting aspect in the area of human performance associated with the decision making component because the licensee failed to use a systematic process for dealing uncertain conditions adverse to quality [H.1(a)].

Inspection Report# : [2013002](#) (*pdf*)

Significance: G Mar 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Comply with Technical Specifications

A self-revealing, Green NCV of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.4 was identified after Unit 2 operators entered a mode with a limiting condition for operation not met. Specifically, following maintenance on auxiliary feedwater pump steam supply valve, SGA-UV-138, plant personnel did not ensure the requirements of TS 3.7.5, "Auxiliary Feedwater System," were met prior to entering Mode 3. During subsequent testing, a bonnet steam leak was discovered on the valve, resulting in the valve being declared inoperable and the plant returned to Mode 5 for repairs. The licensee restored the valve to operable status before re-entering Mode 3. The licensee entered the issue into the corrective action program (CAP) as CRDR 4284491 and is evaluating further corrective actions.

The inspectors concluded that the failure of plant personnel to comply with technical specifications was a performance deficiency. The inspectors concluded the performance deficiency is more than minor because it affected 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. The inspectors evaluated the significance of the issue under the SDP, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and 0609 Appendix A, "The SDP for Findings at-Power." Inspectors concluded that the finding was of very low safety significance (Green) because the finding is not a design or qualification issue, did not represent an actual loss of safety function of the system or train, 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 a seismic, flooding, or severe weather initiating event. The inspectors determined this finding has a cross-cutting aspect in the area of human performance associated with the component of resources because the licensee failed to provide an adequate work package to ensure the valve was operable prior to entering Mode 3 [H.2(c)].

Inspection Report# : [2013002](#) (*pdf*)

Significance: G Mar 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Shutdown Cooling Piping Failure

A self-revealing, Green NCV of 10 CFR Part 50, Appendix B, Criterion III "Design Control," was identified for the

failure of the licensee to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Specifically, operations personnel altered the piping configuration with an added fitting to a low pressure safety injection drain line. As a result the pipe failed during shutdown cooling operations, rendering that train inoperable. The licensee repaired the weld in accordance with ASME Code, entered the issue into the licensee's CAP as CRDR 4263357, and revised procedural guidance to return components to their design configuration.

The inspectors concluded that the failure of the licensee to correctly translate the design basis into specifications, drawings, procedures and instructions was a performance deficiency. The performance deficiency was more than minor, therefore a finding, because it adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone and its objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of the issue under the SDP, as defined in Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix G, "Shut Down Operations Significance Determination Process." The inspectors determined that because there was an injection path available, the leak could be isolated prior to depletion of the reactor water tank, and the steam generators were available for heat removal. As a result, the issue was found to be of very low safety significance (Green). The inspectors determined the finding had no cross-cutting issues because it is not indicative of current performance.

Inspection Report# : [2013002](#) (*pdf*)

Barrier Integrity

Significance: G Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Operability Determination Procedure for Maintaining Administrative Limits

The inspectors identified a Green noncited violation of 10 CFR Part 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure of operations and engineering personnel to follow station procedures to perform operability determinations and functional assessments. Specifically, plant personnel did not maintain appropriate controls to ensure that the temperature limit established in the operability determination for the spent fuel pool criticality analysis was maintained. The licensee entered the issue into their corrective action program as PVAR 4380424, began taking more frequent readings of spent fuel pool temperature indicators, and lowered the spent fuel pool temperature alarm setpoint.

The failure to follow Procedure 40DP-9OP26 for performing operability determinations is a performance deficiency. This performance deficiency is more than minor, and therefore a finding, because it is associated with the Barrier Integrity Cornerstone attribute of procedure quality and it adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accident or events. The inspectors evaluated the significance of the finding using Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors reviewed all Barrier Integrity screening questions in IMC 0609, Appendix A, Exhibit 3 Section D, and all questions were answered "No." Therefore, the finding was determined to be of very low safety significance. The inspectors determined that the finding has a cross-cutting aspect in the area of human performance associated with decision making. Specifically, the licensee did not communicate the administrative limits established in the spent fuel pool criticality operability determination to appropriate operations personnel [H.1(c)].

Inspection Report# : [2013003](#) (*pdf*)

Emergency Preparedness

Significance:  Sep 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain an effective Emergency Plan for a Seismic Event

The inspectors identified a non-cited violation of 10 CFR 50.54 (q)(2) for the failure to maintain an effective emergency plan action level scheme in accordance with 50.47(b)(4). Specifically, the Alert threshold for HA1.1, "Natural or Destructive Phenomena Affecting VITAL AREAS," requires a declaration of an Alert for a seismic event greater than operating basis earthquake as indicated by any force balance accelerometer reading greater than 0.10g. Operators rely on alarms to verify the acceleration beyond the operating basis earthquake and the inspectors determined the seismic monitor alarm set point was 0.13g. This could result with the inability of operations personnel to classify an event at the Alert level. A design change modified the seismic monitoring set point to 0.1g and restored compliance. The licensee entered the issue into their corrective action program as Palo Verde Action Request 3624077.

The inspectors determined that the failure to maintain an effective emergency action level scheme was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it adversely affected the Emergency Response Organization Performance attribute of the Emergency Preparedness Cornerstone and its objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee's ability to declare an Alert based on Natural Phenomenon at the correct threshold was degraded. The inspectors assessed the significance of the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Figure 5.4-1, and determined the finding to be of very low safety significance because compensatory measures were available for emergency response organization personnel to perform the classification duties. The inspectors determined this finding is not indicative of current performance and therefore no cross-cutting aspect is assigned.

Inspection Report# : [2013004](#) (*pdf*)

Significance:  Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to identify weak performance during an exercise

The inspectors identified a Green NCV of 10 CFR 50.47(b)(14) for the licensee's failure to identify and correct a performance deficiency during an evaluated exercise. Specifically, the licensee failed to identify that the Emergency Director in the Simulator Control Room did not evaluate emergency action level RS-1 when information was available indicating a need to upgrade the emergency classification because of offsite radiation dose.

The failure to identify a deficiency occurring during a drill and ensure correction is a performance deficiency within the licensee's control. The finding is more than minor because the failure to identify a deficiency and ensure correction impacts the Emergency Preparedness cornerstone objective associated with the emergency response organization performance cornerstone attribute. The finding is a non-cited violation of 10 CFR 50.47(b)(14). The finding was evaluated using the Emergency Preparedness SDP and identified as having very low safety significance because it was a failure to comply with NRC requirements and was not a loss of the planning standard function because the classification deficiency was associated with a successful performance indicator opportunity. The Emergency Director declared the correct emergency classification within fifteen minutes of performing the dose assessment report using an emergency action level for which conditions currently existed, although this was not the first emergency action level that applied. This issue was entered into the CAP as PVAR 4365021. The finding was assigned a cross-cutting aspect of 'Low Threshold,' because the licensee failed to completely and accurately recognize

a performance deficiency [P.1.a]
Inspection Report# : [2013002](#) (*pdf*)

Occupational Radiation Safety

Significance: N/A Mar 31, 2013

Identified By: NRC

Item Type: VIO Violation

Failure to Maintain the Updated Final Safety Analysis Report for Radwaste Systems and Processes

The inspectors identified a Severity Level IV violation of 10 CFR 50.71(e), “Maintenance of Records, Making of Reports,” with two examples for the failure to restore compliance within a reasonable time after a previous Severity Level IV non-cited violation of 10 CFR 50.71(e) was identified. The violation was identified because the licensee failed to periodically update the Updated Final Safety Analysis Report (UFSAR) with all changes made in the facility or procedures. Specifically,

Example 1: From 1988 to 2013, the licensee did not update Chapter 11.2.2.3, “Liquid Radwaste System,” with a description of the temporary adsorption tanks and their use. The licensee has entered this violation into their corrective action program as PVAR 3075089.

Example 2: From December 2003 to January 2013, the licensee made changes to the facility and procedures as described in the UFSAR, and performed safety analyses and evaluations in support of these changes, but failed to update the UFSAR to include these changes. Specifically, the licensee built the old steam generator storage facility used for long-term storage of radioactive waste (six replaced steam generators and three reactor vessel heads) on the owner controlled site until decommissioning. The licensee has entered this violation into their corrective action program as Condition Report (CR) 3398042 and PVAR 4330483.

This violation is more than minor because the NRC relies on licensees to identify and report conditions or events meeting the criteria specified in the regulations in order to perform its regulatory function. Because this issue affected the NRC’s ability to perform its regulatory function, it was evaluated using the traditional enforcement process. The issue was characterized as a Severity Level IV violation in accordance with Section 6.1.d.3 of the NRC Enforcement Policy because the erroneous information in the UFSAR was not used to make an unacceptable change to the facility or procedures. A cross-cutting aspect was not assigned because the violation was handled through traditional enforcement.

Inspection Report# : [2013002](#) (*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.

Miscellaneous

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