

Palo Verde 2

3Q/2015 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2015

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Take Timely Corrective Actions to Prevent Charging Pump Discharge Bladder Failure

The inspectors documented a finding for the failure to take timely corrective actions associated with failure of the discharge pulsation dampener poppet valves in the positive displacement pump charging system. Specifically, following the investigation of a failing discharge dampener bladder on the Unit 2 charging pump E and the discovery that the poppet valve stem was galled and stuck in the poppet valve seat, the licensee determined that routine monthly monitoring and the 5 year bladder replacement maintenance would identify further failures in the other charging system trains. The licensee entered this issue into the corrective action program as Condition Report 15 4230.

Failure to take timely corrective actions to replace the charging pump discharge dampener poppet valve assembly for susceptible charging trains, specifically the Unit 2 charging pump B, was a performance deficiency. The performance deficiency was more than minor because it is associated with the equipment performance attribute and directly affected the Initiating Event Cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to correct this condition adverse to quality did result in a reactor coolant system transient and challenged normal plant operations. Using Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At Power," the performance deficiency was determined to be of low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors also identified a cross-cutting aspect in the area of human performance associated with training: the organization provides training and ensures knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values. Specifically, system engineers were not taught that the station's positive displacement pumps do not have internal check valves, but actually have plate valves that do not prevent gas or fluid from flowing back through the pump. This knowledge gap gave the system engineering staff a false sense of security in that a failure of the discharge pulsation dampener would not affect the other charging pumps. The system engineers failed to recommend a more prompt replacement schedule for the poppet valve and assembly [H.9].

Inspection Report# : [2015002](#) (*pdf*)

Significance: G Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Establish Adequate Procedures to Respond to a Total Loss of Charging Event

The inspectors documented a non-cited violation of Technical Specification 5.4.1.a, Regulatory Guide 1.33, Revision 2, Appendix A, Section 6.t, February 1978. Specifically, the licensee failed to establish adequate procedures for combating emergencies and other significant events regarding a total loss of charging pumps due to gas binding that affected reactor coolant system pressure and level control. On March 20, 2015, Unit 2 experienced a total loss of charging and had to rely on a normal operating procedure, which was not written to combat a total loss of charging flow due to gas binding from a failed discharge pulsation dampener. The licensee entered this issue into the corrective

action program as Condition Report 15 4230.

The failure to provide adequate procedures for combating emergencies and other significant events regarding a total loss of charging pumps due to gas binding that affected reactor coolant system pressure control was a performance deficiency. The performance deficiency was more than minor because it is associated with the procedure quality attribute and directly affected the Initiating Event Cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the lack of adequate procedural guidance unduly challenged reactor operators during the loss of charging event. In accordance with Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," the performance deficiency was determined to be of very low safety significance (Green) because the finding did not result in a reactor trip and the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined that this finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance because the decision to eliminate the abnormal operating procedure and not to train reactor operators was made in 1997.

Inspection Report# : [2015002](#) (*pdf*)

Mitigating Systems

Significance:  Jun 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Identify and Correct Engineered Safety Features Actuation System Steam Generator Differential Pressure Setpoint Drift

The inspectors reviewed a Green self-revealing non-cited violation of Technical Specification 5.4.1.a for failure to establish and implement procedures recommended by Regulatory Guide 1.33 Appendix A, Item 5.0, "Abnormal, Off-Normal and Alarm Conditions." Specifically, on January 11, 2015, Unit 2 received a steam generator pressure difference setpoint alarm on channel B but failed to determine the cause of the alarm. As a result, the auxiliary feedwater actuation signal channel was inoperable for a period of 13 days, greater than the technical specification allowed outage time of 1 hour. The licensee entered this condition in their corrective action program and performed a root cause evaluation under Condition Report Disposition Request 4618033.

The inspectors concluded that the failure to provide adequate alarm procedures was a performance deficiency. The inspectors concluded that the performance deficiency was more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the control room operators did not have an alarm response procedure for plant monitoring system (RJ) alarm on point SASB22, which resulted in the channel B auxiliary feedwater actuation signal steam generator 2 drifting out of tolerance for a period of 13 days. This exceeds the allowed outage time specified in the technical specifications. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The finding screened to a detailed risk evaluation because it involved the actual loss of function of at least a single train for greater than its technical specification allowed outage time. A Region IV senior reactor analyst performed a detailed risk evaluation and determined that the change in core damage frequency $CDF < 5E-9$ corresponds to very low (Green) safety significance. The inspectors determined this finding has a cross cutting aspect in the area of human performance associated with the change management component. The licensee had an opportunity to identify the lack of alarm procedures associated with this parameter along with 74 other alarms that

have technical specification implications during the design modification process for the plant computer alarm system.
Inspection Report# : [2015002](#) (*pdf*)

Significance: G Dec 31, 2014

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Verify the Adequacy of the Design of the Diesel Fuel Oil Cooler

Green. The inspectors reviewed a self-revealing Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control” for the station’s failure to adequately review the suitability of materials of the diesel fuel oil cooler. Specifically, the Unit 2 “A” diesel generator fuel oil cooler design allowed for the interface of two dissimilar metals which promoted galvanic corrosion. This corrosion ultimately affected the structural integrity of the cooler which rendered the “A” essential spray pond inoperable. In response to this, the licensee has replaced all six of the fuel oil cooler covers and initiated a design change to remove the fuel oil cooler from service. The licensee has entered the issue into the corrective action program as Condition Report Disposition Request 4543394.

The failure to verify the adequacy of the design of the diesel fuel oil cooler was a performance deficiency. The performance deficiency is more than minor because it affected the equipment performance attribute of the Mitigating Systems cornerstone to ensure the availability, reliability, capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the Unit 2 “A” diesel fuel oil cooler design allowed for the interface of two dissimilar metals which promoted galvanic corrosion. The corrosion ultimately affected the structural integrity of the cooler which rendered the Unit 2 “A” spray pond inoperable. In accordance with NRC Inspection Manual 0609, Appendix A, Exhibit 2, “Mitigating Systems Screening Questions.” 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 change to the core damage frequency was 1.5E-7/year (Green). The dominant core damage sequences included loss of offsite power events that lead to station blackout conditions. The gas turbine generators and the auxiliary feedwater system helped to minimize the risk. The inspectors determined this finding has no cross-cutting aspect because it is not indicative of current performance.

Inspection Report# : [2014005](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

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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