Salem 2
2Q/2013 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2013
Identified By: NRC
Item Type: FIN Finding
Inadequate Relay Testing Instructions Cause Loss of One Offsite Power Source
(Green) A self-revealing finding was identified because the work instructions used to perform relay testing on January 21, 2013, did not include the level of detail required by site work planning standards. Specifically, they did not specify the test switches that needed to be open to isolate the transformer for the testing. This caused the loss of #4 station power transformer (SPT), which caused both units to align the 4160 Vac vital buses to a single source of offsite power and Unit 2 to reduce power to 95 percent when it lost half of its running circulating water pumps. Planned corrective actions include updating relay procedures and reevaluating the risk assignment of relay work.

The performance deficiency was determined to be more than minor because it is associated with the procedure quality 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 shut-down as well as power operations. Specifically, PSEG work instructions did not include which test switches were required to be opened prior to testing, which led to the loss of one source of offsite power at each unit and Unit 2 down-powering due to the loss of circulating water pumps. In accordance with IMC 0609.04, “Initial Screening and Characterization,” and Exhibit 1 of IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding had a cross-cutting aspect in the area of Human Performance, Work Control, because PSEG did not plan and coordinate work activities consistent with nuclear safety. Specifically, PSEG did not incorporate risk insights on the potential impact on offsite power during #4 SPT maintenance. As a result, PSEG did not plan and coordinate work activities to minimize the probability or consequences of the loss of off-site power. [H.3(a)]
Inspection Report# : 2013002 *(pdf)*

Significance: G Mar 31, 2013
Identified By: NRC
Item Type: FIN Finding
Failure to Implement Feedwater Control Valve Corrective Actions
(Green) A self-revealing finding was identified because PSEG did not implement timely and effective corrective actions to address feedwater control valve (FCV) positioner malfunctions that occurred between 2004 and 2012, The inspectors determined that minor malfunctions between 2007 and 2012 provided PSEG indication that the ability of FCVs to properly respond to plant transients remained adversely affected and that actions completed to date may not have been effective. As a result of PSEG's ineffective and untimely action, on November 25, 2012, Unit 2 tripped from 92 percent power due to a malfunction of FCV 24BF19. Planned corrective actions include replacing the FCV positioners with digital controllers during the next refueling outage at each unit.

The performance deficiency was determined to be more than minor because it affected the equipment performance

attribute of the Initiating Events cornerstone objective and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as at power operations. Specifically, the failure of the FCV to reposition as demanded resulted in a low steam generator level and subsequent plant trip. In accordance with IMC 0609.04, "Initial Screening and Characterization," and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not cause both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding has a cross-cutting aspect in the area of Human Performance, Decision Making, because PSEG decisions did not demonstrate that nuclear safety was an overriding priority. Specifically, PSEG did not demonstrate conservative assumptions in decision making by postponing corrective actions to prevent recurrence over an eight year time span, despite numerous issues with the feed water regulating valves that culminated in the plant tripping [H.1(b)]

Inspection Report# : 2013002 *(pdf)*

Mitigating Systems

Significance: G Jun 30, 2013
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Evaluate Unit 2 Service Water Accumulator Discharge Valve IST Not Meeting Acceptance Criteria
A self revealing NCV of Salem TS 6.8.4.j, "Inservice Testing (IST)," that implements the IST program for American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components in accordance with the ASME Operations and Maintenance (OM) code was identified. Specifically, the opening stroke time for a Unit 2 service water (SW) accumulator discharge valve (22SW535) exceeded the IST acceptance criteria of 1.0 seconds on four occasions during the 92 day test interval, after the acceptance criteria was incorrectly changed on December 21, 2010. The PSEG corrective action for the IST results not meeting the acceptance criteria was to perform an engineering evaluation which reduced the margin of the SW pressure decrease in the SW system downstream of the containment fan cooling units (CFCUs) while changing the IST 45 degree opening stroke time to 1.25 seconds. PSEG also entered this issue into their corrective action program (CAP) under Notification 20607549.

The PD was determined to be more than minor because it is similar to IMC 0612, Appendix E, Example 2.a, in that, in the performance of reviewing a completed IST, it was discovered that the acceptance criteria was incorrect and that the recorded stroke time of 22SW535 exceeded the correct acceptance criteria to meet action range limits. The PD is also associated with the equipment performance attribute of the mitigating systems cornerstone, and it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the 45 degree opening time of 22SW535 was greater than its acceptance criteria of 1.0 seconds to meet the TS 6.8.4.j, "IST Program," requirements. The inspectors evaluated the finding in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations (IMC 0609A)." The inspectors determined that the finding was of very low safety significance (Green) because the deficiency did not affect the design or qualification of the SW system and it did not represent a loss of system or train safety function. This finding has a cross-cutting aspect in the area of Human Performance, Resources, because PSEG did not ensure that complete, accurate, and up-to-date design documentation, procedures, and work packages. Specifically, PSEG made a non-conservative revision to the IST acceptance criteria to the SW accumulator discharge valves without evaluating this change was adequate to assure nuclear safety. [H.2(c)] (Section 1R15)

Inspection Report# : 2013003 *(pdf)*

Significance: G Mar 31, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Inadvertent Isolation of Service Water to all EDGs in Mode 6
(Green) A self-revealing NCV of Technical Specification (TS) 6.8.1, "Procedures and Programs," was identified because PSEG personnel did not use the documentation required by site procedures to verify component position during removal of a clearance tagout. As a result, on November 4, 2012, PSEG personnel isolated SW to all emergency diesel generators (EDGs) at Unit 2 while in Mode 6 with fuel movement in progress. As corrective actions, PSEG conducted valve line-up training for field operators and initiated additional field oversight of in-plant activities.

The performance deficiency was determined to be more than minor because it affected the configuration control 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, a SW valve was incorrectly positioned, isolating all cooling water to the EDGs. The inspectors evaluated the finding using IMC 0609.04, "Initial Characterization of Findings," Attachment 1 of IMC 0609, and Appendix G, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs – Attachment 4 PWR Refueling Operation: RCS level >23' or PWR Shutdown Operation with Time to Boil >2 hours and Inventory in the Pressurizer." Because no loss of control occurred and all mitigating capabilities were available, a Phase 2 quantitative assessment was not required. Therefore, the inspectors determined the finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the area of Human Performance, Work Practices, in that PSEG did not effectively communicate human error prevention techniques commensurate with the risk of the assigned task. Specifically, the pre-job brief did not enforce the expectation to contact supervision when an unexpected condition was identified, personnel did not perform self-checking prior to component manipulation, and personnel proceeded in the face of uncertainty. [H.4(a)]

Inspection Report# : 2013002 *(pdf)*

Significance: G Sep 30, 2012
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadvertent Injection of Auxiliary Feedwater into the 23 Steam Generator
A self-revealing NCV of Technical Specification (TS) 3.7.1.2.a, "Auxiliary Feedwater System," was identified because the 23 steam generator flow control valve from the 21 auxiliary feedwater (AFW) pump went open unexpectedly during the in-service test of the 21 AFW pump. Specifically, the air supply to the 23AF21 valve was found closed, resulting in the valve opening when the pump was started and the inability to close this valve from the control room using the valve flow controller.

The inspectors determined that the performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone, and it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that the finding was of very low safety significance (Green) because the system maintained the ability to inject water into each of the steam generators. Senior reactor analyst review determined that the valve failure to close is not modeled in sequences which could lead to core damage. Prompt corrective actions included labeling and tagging the adjacent air supply regulator that was used to supply air for other instrumentation calibration and testing. Corrective actions planned include revisions to the

Maintenance Alteration Process procedure to require that all alterations to positionable components are reviewed and approved by a licensed senior reactor operator, and a revision to the Control of Equipment and System Status procedure to prohibit the operation of unlabeled equipment in the power block. The inspectors determined that this finding has a cross-cutting aspect in the area of human performance, work practices, because PSEG did not adequately communicate human error prevention techniques, such as holding pre-job briefs and self and peer checking. Specifically, flagging and robust barriers were not used in a situation where multiple similar components existed within close proximity to each other, which resulted in the isolation of the air regulator valve for valve 23AF21, located next to an unmarked air regulator valve that had been utilized for testing of instrumentation.

Inspection Report# : 2012004 *(pdf)*

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Significance: G Jun 30, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Follow Radiation Protection Procedures to Identify and Control Access to a Locked High Radiation Area
The inspectors identified a self-revealing finding of very low safety significance associated with failure to implement TS 6.8 procedures. Specifically, the inspectors identified that PSEG did not implement radiation protection procedure requirements associated with survey and access control to the Unit 2 reactor cavity on November 7, 2012, resulting in lack of identification and control of a TS 6.12, “Locked High Radiation Area (LHRA).” PSEG entered this issue into their CAP as Notification 20582871.

The failure to implement TS required radiation protection procedures is a PD. The PD was determined to be more than minor because it was related to the programs and process attribute of the occupational radiation safety cornerstone, and adversely affected the cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation from radioactive material during routine reactor operation. Further, if left uncorrected, the PD had the potential to lead to a more significant safety concern if the LHRA was undetected. The finding was assessed using IMC 0609, Appendix C, 2 Enclosure, “Occupational Radiation Safety SDP,” dated August 19, 2008, and was determined to be of very low safety significance (Green) because it was not related to as low as reasonably achievable (ALARA), did not result in an overexposure or a substantial potential for overexposure, and did not compromise PSEG’s ability to assess dose. This finding has a cross-cutting aspect in the area of Human Performance, Work Control. Specifically, PSEG did not effectively coordinate this work activity by incorporating actions to address the impact of the work on different job activities, and the need for work groups to maintain interfaces and communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance. [H.3(b)] (Section 2RS1)

Inspection Report# : 2013003 *(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

Last modified : September 03, 2013