Salem 2
2Q/2014 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Maintain Shutdown Margin Calculation Procedure to Cover certain Mispositioned Control Rod Events
The inspectors determined there was a Green, self-revealing violation of TS 6.8.1, "Procedures and Programs," as described in Regulatory Guide 1.33, Revision 2, February 1978, when PSEG did not maintain procedure SC.RE-ST.ZZ-0002, "Shutdown Margin Calculation," to cover certain mispositioned control rod events. Consequently, PSEG performed unnecessary rapid boration, and a subsequent manual reactor trip, in response to a control rod drop event on January 31, 2014. PSEG entered this in their corrective action program (CAP), implemented compensatory measures for calculating shutdown margin, performed an apparent cause evaluation, and initiated actions to correct the cause of the problem, extent of condition, and extend of cause.

The issue was more than minor because it was associated with the procedure quality attribute of the initiating events cornerstone, and adversely affected the 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 finding resulted in unnecessary rapid boration and a manual reactor trip. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The SDP for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because it did not cause the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Teamwork, because PSEG work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained [H.4]. Specifically, PSEG reactor engineering and operations services did not communicate and coordinate a change to the shutdown margin calculation procedure that was conducted in response to vendor-issued guidance.
Inspection Report# : 2014003 *(pdf)*

Significance: G Mar 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Online Risk Assessment for an Adverse Change in Grid Conditions
The inspectors identified a Green NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50.65(a)(4) when PSEG inadequately assessed risk during a period of adverse grid conditions. On January 7, 2014, the regional transmission organization declared a Maximum Emergency Generation Action, a condition that PSEG was procedurally required to consider a high risk evolution (HRE) for a loss of offsite power (LOOP). Specifically, PSEG was to elevate online risk to a Yellow condition; however, PSEG did not assess risk as Yellow. PSEG subsequently elevated their risk condition, protected equipment, took other risk management actions (RMAs), and entered the issue in their CAP.

The issue was more than minor since it was associated with the Protection Against External Factors attribute of the Initiating Events cornerstone and adversely affected its 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 extreme cold weather conditions indirectly were affecting grid stability and required risk assessment and management. Additionally, it was similar to IMC 0612, Appendix E, example 7.e, in that an inadequate risk assessment is not minor if the overall plant risk would put the plant into a higher licensee-established risk category. In this case, plant risk was reclassified from Green to Yellow when properly assessed. Specifically, the extreme cold weather conditions indirectly were affecting grid stability. The inspectors evaluated the finding using IMC 0612, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." Since the incremental core damage probability deficit was less than 1 E-6 and the incremental large early release probability deficit was less than 1 E-7, this finding was determined to be of very low safety significance (Green). The finding was determined to have a cross-cutting aspect in the area of Human Performance, Teamwork, in that individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, PSEG staff in the Electric System Operations Center (ESOC), Salem control room, and Hope Creek control room did not appropriately communicate across organizational boundaries to ensure that risk was appropriately assessed.
Inspection Report# : 2014002 *(pdf)*

Significance: G Mar 31, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Risk Assessment and Risk Management Actions for UV Testing
Inspectors identified a Green NCV of 10 CFR 50.65(a)(4) when PSEG did not properly assess Unit 2 risk and implement RMAs in accordance with station procedures. PSEG conducted undervoltage (UV) surveillance testing on a 4 kilovolt (kV) vital bus without considering plant conditions to include operations without a redundant offsite power source and work in the vicinity of protected equipment. PSEG entered this in their CAP and completed a crew clock reset.

The issue was more than minor since it was associated with the Equipment Performance attribute of the Initiating Events cornerstone and adversely affected its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, UV testing of a vital bus when powered by a single offsite power source had the potential to result in a loss of vital bus power or a LOOP. Additionally, the issue was more than minor based on similarity to IMC 0612, Appendix E, examples 7.e and 7.f. Specifically, the overall elevated plant risk placed the plant into a higher licensee-established risk category and required, under plant procedures, RMAs that were not implemented. The inspectors evaluated the finding using IMC 0612, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." A senior reactor analyst considered the base condition of an increased probability of a LOOP and the lack of RMAs as two order of magnitude increases. Since the incremental core damage probability deficit was less than 1 E-6 and the incremental large early release probability deficit was not applicable for this issue, this finding was determined to be of very low safety significance (Green). The finding was determined to have a cross-cutting aspect in the area of Human Performance, Conservative Bias, in that individuals use decision making-practices that emphasize prudent choices over those that are simply allowable. Specifically, PSEG did not implement procedurally driven decision-making that would have emphasized prudent choices regarding UV testing under different plant conditions.
Inspection Report# : 2014002 *(pdf)*

Significance: G Mar 31, 2014
Identified By: Self-Revealing
Item Type: FIN Finding
Inadequate Inspection of Isolated Phase Main Bus Duct Cooling Fan Sheave
A self-revealing Green FIN was identified against PSEG procedure MA-AA-716-009, "Use of Maintenance Procedures," Revision 5, when PSEG staff did not follow "the rules of usage for Maintenance Department

procedures" as applied to work on a Unit 2 isolated phase bus cooling fan. Specifically, PSEG staff did not perform inspection and testing as required. Subsequently, the 2B fan belts broke causing high temperatures in the bus enclosure, control room alarms, and an unplanned reduction to 51 percent reactor thermal power. As interim corrective actions, PSEG entered this in their corrective action program (CAP), initiated a prompt investigation, installed fan belts and swapped operations to the 2A motor, and established weekly readings to monitor drive belt conditions.

The issue was more than minor since it was associated with the Equipment Performance attribute of the Initiating Events cornerstone and adversely impacted its 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 of the drive belts resulted in an unplanned downpower. The finding was evaluated in accordance with IMC 0609, Attachment 4, and Appendix A where it screened as very low safety significance (Green) as a support system initiator. Specifically, the finding did contribute to the likelihood of, or cause, both an initiating event and affect mitigation equipment. The finding had a cross-cutting aspect in the area of Human Performance, Teamwork, in that individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, PSEG operations, maintenance, and engineering staff did not coordinate to ensure that inspections and testing were completed appropriately or that decisions not to complete steps as required were reviewed by the appropriate departments.
Inspection Report# : 2014002 *(pdf)*

Significance: G Aug 01, 2013
Identified By: NRC
Item Type: FIN Finding
Failure to Evaluate Performance Deficiency for FIN 2011004-02
The inspectors identified a Green finding (FIN) for PSEG's failure to evaluate the performance deficiency documented for FIN 2011004-02 in accordance with procedure LSAA-1003, "NRC Inspection Preparation and Response." Specifically, PSEG failed to initiate a notification to review FIN 2011004-02 and develop appropriate corrective actions. The original finding, FIN 201100402, was associated with untimely corrective actions for degraded reactor coolant pump motor cables. In addition to not addressing the performance deficiency, the failure to initiate a notification creates the potential for future untimely corrective actions in similar cases. This issue was entered into PSEG's corrective action program as notification 20616485.

This finding is more than minor because if left uncorrected the issue has the potential to lead to a more significant safety concern. Specifically, PSEG has not corrected the performance deficiency which resulted in untimely corrective actions with regards to FIN 2011004-02. If similar untimely corrective actions were taken on a safety system this could result in a more significant safety concern. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, this finding is of very low safety significance (Green) because it did not involve the complete or partial loss of a support system that contributes to the likelihood of, or cause, an initiating event and did not affect mitigation equipment. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because PSEG did not completely and accurately identify the issue for FIN 2011004-02. Specifically, PSEG did not initiate a notification to review FIN 2011004-02 to ensure corrective actions properly address the finding. [P.1(a)]

Inspection Report# : 2013008 *(pdf)*

Mitigating Systems

Significance: G Mar 31, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Follow Fire Protection Test Procedure Resulted in Fuel Oil Spill
The inspectors determined there was a Green, self-revealing violation of Technical Specification (TS) 6.8.1, "Procedures and Programs," as described in Regulatory Guide 1.33, Revision 2, February 1978, when PSEG failed to adequately implement procedure steps associated with fire protection hose flow verification testing on March 6, 2014. Consequently, a fuel oil day tank was overfilled, resulting in approximately 3000 gallons of fuel oil on the pump house roof, leaks through the roof onto the fire pumps, and Salem fire water suppression system unavailability for approximately two days. PSEG stopped the leak, entered this issue in their CAP, and completed a Prompt Investigation.

The inspectors determined that the performance deficiency was more than minor because it was associated with the Protection Against External Factors attribute of the Mitigating System cornerstone and adversely its cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events (fire) to prevent undesirable consequences. The inspectors determined that the finding was of very low safety significance (Green) because it did not impact the ability of Salem Units 1 or 2 to achieve and maintain safe shutdown. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because PSEG fire protection operators did not recognize and plan for the possibly of mistakes, latent issues, and inherent risk, even while expecting successful outcomes of procedure steps to refill the fuel oil day tank. Further, they did not implement appropriate error reduction tools.
Inspection Report# : 2014002 *(pdf)*

Significance: G Mar 31, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Post-Maintenance Testing of a Chiller
A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion XI, "Test Control," was identified when PSEG did not perform adequate post-maintenance testing (PMT) of the 22 chiller. The chillers cool safety-related loads in the auxiliary building during normal and emergency conditions. After failing to pump-down, corrective maintenance, and restoration, the chiller failed to pump-down again three days later. PSEG entered this in their CAP, backdated inoperability, performed a crew clock reset, and investigated the issue.

The finding was more than minor since it affected the Equipment Performance attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate PMT resulted in additional inoperability and unavailability of the 22 chiller. The finding was evaluated in accordance with IMC 0609, Appendix A, and screened to Green since it was not a design or qualification deficiency, not a loss of function, and did not involve equipment or function designed to mitigate a seismic, flooding, or severe weather initiating event. The finding was determined to have a cross-cutting aspect in the area of Human Performance, Consistent Process, in that individuals use a consistent, systematic approach to make decisions. Specifically, PSEG did not use a systematic approach to make decisions regarding the proper PMT.
Inspection Report# : 2014002 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Assessment of Fire Brigade Performance during an Unannounced Drill
The inspectors identified a Green NCV of Unit 2 license condition 2.C.(10), Fire Protection, when PSEG did not adequately assess fire brigade performance during an unannounced drill on November 18, 2013, as required by the fire protection program. Specifically, PSEG did not adequately assess the selection, placement and use of equipment and fire-fighting strategies, conformance with established plant fire-fighting procedures, and the use of fire-fighting equipment, including communication equipment.
PSEG entered this into their CAP as notification 20632422 and chartered an apparent cause evaluation.

The inspectors determined that the issue was more than minor since it was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and impacts its objective of ensuring the availability, reliability, and capability of systems, such as the fire brigade, that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety Significance (Green) in accordance with D.1 of IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." Because the finding involved fire brigade training requirements, the fire brigade demonstrated the ability to meet the required times for fire extinguishment for the fire drill scenarios, and the finding did not significantly affect the fire brigade's ability to respond to a fire, the finding was of very low safety significance (Green). The finding was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution, Self and Independent Assessments, in that licensees conduct assessments of their activities to assess performance and identify areas of improvement. Specifically, the PSEG self-evaluation of fire brigade performance was not of sufficient depth, appropriately objective, and selfcritical. [P.3(a)] (Section 1R05)

The inspectors identified a Green NCV of TS 6.8.1, "Procedures and Programs", as described in Regulatory Guide (RG) 1.33, Revision 2, when PSEG did not properly implement high energy line break (HELB) barrier controls in accordance with CC-AA-201, Plant Barrier Control, during maintenance activities that affected the performance of safety-related equipment on October 1, 2 and 17, 2013. PSEG entered the issue into the CAP under notifications 20623371 and 20633614.

This finding was more than minor because it was associated with the configuration control attribute of the Mitigating System cornerstone, and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, improper barrier controls could potentially affect the operating equipment in the case of a HELB. This performance deficiency required a detailed risk evaluation (DRE) in accordance with IMC 0609, Appendix A, screening questions in Exhibits 2, "Mitigating Systems," because of an assumed loss of the AFW system decay heat removal safety function. The inspectors and a Region I Senior Reactor Analyst (SRA) conducted a bounding DRE and determined this finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the area of Human Performance, Work Control, in that licensees plan and coordinate work activities by incorporating the need for planned contingencies, compensatory actions, and abort criteria. Specifically, PSEG did not properly plan and coordinate compensatory actions via station procedures for HELB barrier impairments. [H.3(a)] (Section 1R18)

Inspection Report# : 2013005 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: NCV NonCited Violation

Inadequate HELB Barrier Controls
The inspectors identified a Green NCV of TS 6.8.1, "Procedures and Programs", as described in Regulatory Guide (RG) 1.33, Revision 2, when PSEG did not properly implement high energy line break (HELB) barrier controls in accordance with CC-AA-201, Plant Barrier Control, during maintenance activities that affected the performance of safety-related equipment on October 1, 2 and 17, 2013. PSEG entered the issue into the CAP under notifications 20623371 and 20633614.

This finding was more than minor because it was associated with the configuration control attribute of the Mitigating System cornerstone, and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, improper barrier controls could potentially affect the operating equipment in the case of a HELB. This performance deficiency required a detailed risk evaluation (DRE) in accordance with IMC 0609, Appendix A, screening questions in Exhibits 2, "Mitigating Systems," because of an assumed loss of the AFW system decay heat removal safety function. The inspectors and a Region I Senior Reactor Analyst (SRA) conducted a bounding DRE and determined this finding to be of very low safety significance (Green). This finding had a cross-cutting aspect in the area of Human Performance, Work Control, in that licensees plan and coordinate work activities by incorporating the need for planned contingencies, compensatory actions, and abort criteria. Specifically, PSEG did not properly plan and coordinate compensatory actions via station procedures for HELB barrier impairments. [H.3(a)] (Section 1R18)
Inspection Report# : 2013005 *(pdf)*

Significance: G Aug 01, 2013
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
13 Switchgear and penetration Area Ventilation Supply Fan Motor Bearing Failure due to Deletion of Preventative Maintenance Requirement
A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified because PSEG did not complete a change to a preventative maintenance requirement for the Switchgear and Penetration Area Ventilation (SPAV) fan motors in accordance with PSEG procedure MA-AA-716-210-1005, "Predefine Change Processing." PSEG failed to perform an adequate engineering review of the Preventative Maintenance Change Request (PMCR) when bearing replacements were deleted from the SPAV fan motor maintenance plans in September, 2009. This resulted in the bearing not being lubricated and subsequent failure of the 13 SPAV supply fan motor on February 4, 2013. PSEG entered the issue into the corrective action program as notification 20594424.
The inspectors determined that the performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems cornerstone, and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, because PSEG failed to investigate a difference in bearing type documented in a 1998 NRC commitment letter and the SPAV fan motor material master, they did not resolve conflicting information on the type of bearing installed in the SPAV fan motors before a preventive maintenance change to delete periodic bearing replacements took effect. This resulted in bearing and fan motor failure. 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; did not represent a loss of system safety function; did not screen as potentially risk significant due to external initiating events; and SPAV fans are not designated as high safety-significance in the licensee's maintenance rule program. There is

no cross-cutting aspect assigned because the performance deficiency is not indicative of current performance. Specifically, the performance deficiency involves an issue that occurred greater than three years ago and is not indicative of current performance.

Inspection Report# : 2013008 *(pdf)*

Barrier Integrity

Significance: G Jun 30, 2014
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Solid Pressurizer Control Resulted in Low Temperature Overpressure Relief Lifting
A self-revealing, Green non-cited violation (NCV) of TS 6.8.1, "Procedures and Programs," was identified when PSEG did not control reactor coolant system (RCS) pressure in accordance with a procedure. Consequently, on April 13, 2014, this resulted in lifting a low temperature over-pressure protection valve during solid pressurizer operations. PSEG completed a prompt investigation, an apparent cause evaluation, entered this in their CAP, and submitted a Special Report to the NRC in accordance with TS 6.9.2.

Non-compliance with an operating procedure was a performance deficiency that was more than minor because it was associated with the human performance attribute of the Barrier Integrity cornerstone and affected its objective to provide reasonable assurance that physical design barriers (reactor coolant system) protect the public from radionuclide releases caused by accidents or events. It was also similar to IMC 0612, Appendix E, example 4.b in that not accomplishing activities in accordance with procedures is more than minor if it results in a trip or transient. Specifically, not following the procedure resulted in a reactor coolant system pressure transient that caused a protective relief valve to lift. The issue was evaluated using IMC 0609, Attachment 4, and determined to be associated with the Barrier Integrity cornerstone based on the PORV acting as an RCS boundary mitigator. Since the finding was associated with a shutdown event, IMC 0609, Appendix G, Attachment 1, Exhibit 4.A was used to determine significance. Since the finding was not associated with a freeze seal, nozzle dam, criticality drain-down path, leakage path, or safety injection actuation and did not involve or result in PORV unavailability or a setpoint issue, it screened to Green. The finding had a cross-cutting aspect in the area of Human Performance, Challenge the Unknown, in that individuals stop when faced with uncertain conditions. Specifically, a PSEG operator did not stop his activity after his first attempt to control pressure, communicate the unexpected RCS pressure response to supervision, and resolve the issue prior to resuming activities.
Inspection Report# : 2014003 *(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Significance: G May 04, 2014
Identified By: Self-Revealing

Item Type: NCV NonCited Violation
Failure to Establish and Implement Adequate Radiation Protection Procedures
A self-revealing NCV of very low safety significance was identified for failure to establish and implement TS 6.8 required procedures. Specifically, PSEG did not establish and implement adequate procedures for transfer and control of radioactive material within the Unit 2 fuel transfer canal that resulted in an unrecognized loss of location of radioactive material. As a result, PSEG did not recognize a loss of the location of radioactive material and, on May 4, 2014, did not establish and implement adequate radiological controls to provide for prompt identification and exposure control of elevated radiation dose rates to workers caused by radiation emanating from the radioactive material as water shielding was drained from the unexpected location. PSEG suspended the draining evolution, controlled the affected area, and entered this issue into their CAP (Notifications 20582871, 20649575, 20649581).

The failure to implement TS required radiation protection procedures is a performance deficiency (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 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: 1) it was not related to the as low as reasonably achievable (ALARA) program; 2) did not result in an overexposure or a substantial potential for overexposure; and 3) did not compromise PSEG’s ability to assess dose. This finding has a cross-cutting aspect of Work Management of the Human Performance cross-cutting component. Specifically, PSEG did not implement adequate planning, control and execution of work activities associated with transfer of radioactive material to ensure the identification and management of risk commensurate to the work such that nuclear safety was an overriding priority.
Inspection Report# : 2014003 *(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 : August 29, 2014