

## Salem 2

# 4Q/2013 Plant Inspection Findings

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## Initiating Events

**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*)

**Significance:** G Mar 31, 2013

Identified By: Self-Revealing

Item Type: FIN Finding

### **Inadequate Relay Testing Instructions Cause Loss of One Offsite Power Source**

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: Self-Revealing

Item Type: FIN Finding

#### **Failure to Implement Feedwater Control Valve Corrective Actions**

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)

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## Mitigating Systems

**Significance:**  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:**  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)

**G****Significance:** 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*)

**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: Self-Revealing

Item Type: NCV NonCited Violation

**Inadvertent Isolation of Service Water to all EDGs in Mode 6**

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*)

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## Barrier Integrity

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## Emergency Preparedness

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## 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*)

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## Public Radiation Safety

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## 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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