

## Salem 1

### 2Q/2015 Plant Inspection Findings

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## Initiating Events

**Significance:** G Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Implement Procedures During Shutdown Results in ESF Actuation**

The inspectors identified a Green NCV of TS 6.8.1, "Procedures and Programs," when PSEG operators did not implement the procedure steps to trip the main turbine, and manually initiate auxiliary feedwater (AFW), during shutdown for a refueling outage on October 19, 2014. Consequently, operator response to degrading equipment conditions resulted in an unplanned manual reactor trip and coincident AFW actuation. PSEG's immediate corrective actions included conducting crew performance reviews documented as part of the post-trip review by the site's Plant Operations Review Committee (PORC), and subsequent coaching of operator performance.

The inspectors determined PSEG's failure to trip the main turbine and establish AFW flow on October 19, in accordance with (IAW) abnormal and shutdown procedures, constituted a performance deficiency. The finding was more than minor because it was associated with the Human Performance attribute of the Initiating Event 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, not following procedures in response to the '1B' main power transformer (MPT) challenges resulted in an unplanned manual reactor trip and coincident Engineered Safety Features (ESF) AFW system actuation. In accordance with IMC 0609, Attachment 4, and Exhibit 1 of Appendix A, the inspectors determined that this finding is of very low safety significance, or Green, because the finding 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. The inspectors determined that this finding had a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because PSEG operators did not follow procedures in response to degrading '1B' MPT conditions during shutdown for a refueling outage on October 19.

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

**Significance:** G Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Report a Manual Reactor Trip**

Inspectors identified a Severity Level IV (SLIV) NCV of 10 CFR 50.72(b)(2)(iv)(B) when PSEG failed to make the required event notification within four hours for a valid actuation of the reactor protection system (RPS) when the reactor was critical. Inspectors determined that a manual reactor trip on October 19, 2014, was not in accordance with PSEG's preplanned documented procedural sequence and, therefore, reportable. PSEG entered this in their CAP (20668967) and reported this RPS actuation by updating a previous report (EN 50550) on November 24, 2014.

Failing to submit an event notification in accordance with 10 CFR 50.72 within the required time was a performance deficiency that was reasonably within PSEG's ability to foresee and correct, and should have been prevented. Since the failure to submit a required event report impacts the regulatory process, traditional enforcement applied and the violation was assessed using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section

6.9.d.9, “A licensee fails to make a report required by 10 CFR 50.72,” the issue was determined to be a Severity Level IV violation. The inspectors reviewed the condition for reactor oversight process significance and concluded there was no associated finding. Because this violation involves the traditional enforcement process and does not have an underlying technical violation that would be considered more-than-minor, a cross-cutting aspect is not assigned to this violation in accordance with IMC 0612.

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

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: FIN Finding

**Inadequate Corrective Action to Prevent Recurrence of Silent Steam Generator Feed Pump Coast-Downs**

A Green, self-revealing FIN was identified against NC.WM-AP.ZZ-0002, “Performance Improvement Process,” Revision 6, because PSEG did not adequately correct and prevent recurrence of steam generator feedpump (SGFP) silent coast-down events. Consequently, on April 8, 2014, PSEG operators manually tripped the Unit 1 reactor in response to lowering level in the 13 steam generator that was caused by a coast-down of the 11 SGFP. PSEG created new overhead alarms dedicated to a loss of power to SGFP governor controls, trained licensed operators on a silent SGFP coast-down event, and created a long term corrective action to automate SGFP runbacks on loss of power to the governor controls.

This 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. In accordance with IMC 0609, Attachment 4 and Exhibit 1 of Appendix A, the inspectors determined that this finding is of very low safety significance, or Green, because the finding 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. The inspectors determined there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. Specifically, in accordance IMC 0612, the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance.

Inspection Report# : [2014004](#) (*pdf*)

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: FIN Finding

**Incomplete Corrective Action on Current Transformers Results in Reactor Trip**

A Green, self-revealing finding against PSEG procedure NC.WM-AP.ZZ-0002, “Performance Improvement Process,” Revision 3, was identified for incomplete corrective actions when a Unit 1 main generator phase ‘C’ differential current lockout relay tripped and resulted in a reactor trip. Specifically, a design change package had not been properly implemented in 2004 in response to a similar 2001 reactor trip. PSEG conducted repairs, visual inspections, and testing, entered this matter in its corrective action program, and completed a root cause analysis.

The issue was more than minor since it was associated with the design control 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. In accordance with IMC 0609, Attachment 4 and Exhibit 1 of Appendix A, the inspectors determined that this finding is of very low safety significance, or Green, because the finding 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. The inspectors determined there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. Specifically, in

accordance IMC 0612, the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance.

Inspection Report# : [2014004](#) (*pdf*)

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Inadequate Interim Corrective Actions on Current Transformers Result in Reactor Trip**

A Green, self-revealing finding against PSEG procedure LS-AA-120, “Issue Identification and Screening Process,” Revision 12, was identified for inadequate interim corrective actions when a Unit 1 main generator phase ‘A’ differential current lockout relay tripped and resulted in a reactor trip on May 7, 2014. Specifically, interim corrective actions had not been properly implemented in response to a similar trip on April 13, 2014 for the same failure mechanism. PSEG conducted repairs, entered this matter in its corrective action program, and completed a root cause analysis.

The issue was more than minor since it was associated with the equipment 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, interim corrective actions did not adequately ensure the near-term reliability of transformer connections following an April 2014 failure, leaving the unit susceptible to a similar failure and a reactor trip in May 2014. In accordance with IMC 0609, Attachment 4 and Exhibit 1 of Appendix A, the inspectors determined that this finding is of very low safety significance, or Green, because the finding 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. The finding was determined to have a cross-cutting aspect in Human Performance, Conservative Bias, in that individuals use decision-making practices that emphasize prudent choices over those that are simply allowable. That is, proposed actions are determined to be safe in order to proceed rather than unsafe in order to stop. Specifically, PSEG did not take a conservative approach to decisions regarding the scope of repairs given the unusual condition, did not consider the longer-term consequences when determining how to resolve the emergent CT concern, and did not take timely action to address the degraded condition commensurate with its significance, namely vulnerability to a further failure and a consequent reactor trip.

Inspection Report# : [2014004](#) (*pdf*)

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## **Mitigating Systems**

**Significance:**  Jun 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

#### **Failure To Correct a Condition Adverse To Quality Associated With 12 Chiller Motor**

A self-revealing Green NCV of Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix B, Criterion XVI, “Corrective Action,” was identified for PSEG’s failure to take timely corrective action to correct a condition adverse to quality (CAQ). Specifically, PSEG failed to replace the 12 chiller motor as a corrective action to address extent of condition following a 13 chiller motor failure in 2008. The 12 chiller motor subsequently failed on March 27, 2015. PSEG replaced the 12 chiller motor and the stationary and movable contacts in the main contactor panel.

This issue was more than minor because it was associated with the equipment performance 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, the untimely corrective action resulted in emergent unavailability and associated inoperability of the 12 chiller. The inspectors determined that the finding was of very low safety significance (Green) in accordance with Exhibit 2 of IMC 0609, Appendix A, The Significance Determination Process for Findings At-Power, dated June 19, 2012, because the finding was not a design or qualification deficiency, did not represent a loss of safety system function, did not represent the loss of function for any technical specification (TS) system, train, or component beyond the allowed TS outage time, and it did not represent an actual loss of function of any non TS trains of equipment designated as high safety significance in accordance with PSEG's maintenance rule program. The inspectors determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Resolution, because PSEG did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, PSEG did not replace the motor over a six year period despite having numerous opportunities to replace the 12 chiller motor prior to its failure.

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

**Significance:** G Jun 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

**Failure to Establish Appropriate Breaker Preventive Maintenance Periodicity**

A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instruction, Procedures, and Drawings," was identified because PSEG did not establish an appropriate interval to overhaul 4kV General Electric (GE) Magne-Blast breakers. As a result, the safety-related breakers for the 12 safety injection (SI) pump and 11 component cooling water (CCW) pump were operated beyond the industry recommended overhaul interval and subsequently failed. PSEG's corrective actions included replacing the 12 SI pump and 11 CCW pump breakers, and reducing the overhaul preventive maintenance (PM) frequency to 12 years.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, PSEG did not consider industry recommendations nor develop a basis when establishing 4kV GE Magne-Blast breaker overhaul intervals, which resulted in failure of the 12 SI pump and 11 CCW pump breakers. In accordance with Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green), because the finding was not a deficiency affecting the design or qualification of the mitigating system; it did not represent a loss of system function; it did not represent the loss of function for any TS system, train, or component beyond the allowed TS outage time; and it did not represent an actual loss of function of any non TS trains of equipment designated as high safety significance in accordance with PSEG's maintenance rule program. The inspectors determined this finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Operating Experience, because PSEG did not systematically and effectively collect, evaluate, and implement relevant internal and external operating experience in a timely manner. Specifically, the overhaul frequencies assigned to safety-related 4KV breaker inspections were inadequate to ensure the breakers would operate properly.

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

**Significance:** G Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Inadequate Chiller Maintenance Procedure**

The inspectors identified a Green NCV of TS 6.8.1, "Procedures and Programs," as described in Regulatory Guide (RG) 1.33, Revision 2, February 1978, when PSEG performed chiller water system maintenance activities that were not properly preplanned in accordance with documented instructions, resulting in multiple chiller system trips on both

units. Specifically, PSEG maintenance procedure SC.MD-PM.CH-0001, “ACME Chiller Compressor Inspection and Repair,” did not incorporate documented instructions from the vendor technical document. PSEG performed an apparent cause evaluation (ACE) 70171934, and revised the maintenance procedure that included detailed vendor instructions.

This finding was more than minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failure to install the chiller evaporator gasket in accordance with written instructions from the vendor manual resulted in multiple chiller failures. Using IMC 0609, Attachment 4, “Initial Characterization of Findings,” and Exhibit 2 of IMC 0609, Appendix A, “The Significance

Determination Process for Findings At-Power,” dated June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green) because the finding was not a design or qualification deficiency, did not represent a loss of safety system function, did not represent the loss of function for any TS system, train, or component beyond the allowed TS outage time, and it did not represent an actual loss of function of any non TS trains of equipment designated as high safety significance in accordance with PSEG’s maintenance rule program. This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Evaluation, in that licensees thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their significance. Specifically, PSEG did not thoroughly evaluate chiller divider plate head gasket failures in 2012, such that the resolution addressed the inadequate maintenance procedure instructions.

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

**Significance:**  May 22, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Correct a Condition Adverse to the Quality of the Chillers**

The inspectors identified a Green NCV of 10 CFR, Part 50, Appendix B, Criterion XVI, because PSEG did not assure that an identified condition adverse to quality was corrected. The condition adverse to quality was associated with improper maintenance of the 12 chiller which led to the chiller failure on August 23, 2014. Specifically, a procedure related to compressor rebuilds was not effectively updated to address the improper maintenance practice. PSEG entered this violation into the CAP as notification 20690927, has placed compressor rebuilds that would require use of this procedure on hold, and has purchased new compressors for contingent replacement pending completion of the compressor maintenance procedure changes. The inspectors determined this performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating System cornerstone, and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, improper torqueing of the No. 4 discharge valve plate bolts for the 12 chiller caused the trip of that chiller on August 23, 2014, and, absent the procedural change, the vulnerability continued to exist for the occurrence of future improper torqueing and subsequent chiller failure. The inspectors determined that this finding screened to Green in accordance with IMC 0609, Appendix A, because the finding did not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time. The inspectors determined that this finding had a cross-cutting aspect in evaluation, because PSEG Root Cause 70169007 did not identify the improper torqueing of the discharge plate bolts as a condition adverse to quality. Consequently, PSEG assigned an action (ACIT) to address the problem, rather than a corrective action (CA) which, per LS-AA-125, requires additional reviews that verify the quality of completed corrective actions before closure.

[P.2]

Inspection Report# : [2015008](#) (*pdf*)

**Significance:** G Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Inadequate Corrective Actions for HELB Barrier Controls**

Inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, when PSEG did not implement adequate corrective actions from a previous Green NCV in a timeframe commensurate with its safety significance. Specifically, inadequate corrective actions resulted in high energy line break (HELB) and moderate energy line break (MELB) barriers being unsecured without implementing the associated station process. PSEG immediate corrective actions were to secure the affected barriers and enter these examples in their CAP as 20677643, 20683127, 20680283, and 20680680.

The issue was evaluated in accordance with IMC 0612, Appendix B, and determined to be more than minor since it was associated with the configuration control attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The issue was then evaluated using IMC 0609, Appendix A, where it screened to Green since it was not associated with a design or qualification deficiency or loss of system or function. The issue had a cross-cutting issue in Problem Identification and Resolution, Evaluation, in that organizations thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, PSEG did not thoroughly investigate and evaluate the previous NCV issues in order to understand the bases for staff decisions and the underlying organizational and safety culture contributors.

Inspection Report# : [2015001](#) (*pdf*)

**Significance:** G Feb 13, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Post-fire Safe Shutdown Operator Manual Actions to Align Temporary Ventilation Not Assessed for Feasibility and Reliability**

The team identified a finding of very low safety significance (Green) involving a non-cited violation of Salem Unit 1 Technical Specification 6.8.1.f. for failure to implement and maintain written procedures for fire protection program implementation. S1.OP-AB.FIRE-0001, Control Room Fire Response, Revision 6 and by reference S1.OP-AB.CAV-0001, Loss of Unit 1 Control Area HVAC, Revision 3, were procedures for response to plant fires. Specifically, PSEG failed to implement and maintain procedure instructions for several operator manual actions that established temporary ventilation in safe shutdown areas cooled by Heating, Ventilation, and Air Conditioning (HVAC) equipment subject to fire damage within the Unit 1 Chiller Room. PSEG promptly entered these safe shutdown procedure issues into their corrective action program as notifications 20678200, 20678505, 20678294, and 20679351 for evaluation and longer term corrective actions. Immediate corrective actions included improving the accessibility of contingency fans used to establish temporary ventilation.

This performance deficiency (PD) was more than minor because it is associated with the external events (fire) attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. This PD was also similar to more than minor example 3.k of Inspection Manual Chapter (IMC) 0612, Appendix E, Examples of Minor Issues, in that non-conservative calculation assumptions and programmatic deficiencies in assessing the feasibility and reliability of operator manual actions associated with temporary ventilation resulted in a condition where there was a reasonable doubt of the success of post-fire safe shutdown for a fire in the Chiller Room. The team used IMC 0609, Appendix F, Fire Protection Significance Determination Process, and determined that a phase 2 quantitative screening approach was necessary because the finding could affect the ability to reach and maintain a stable plant condition within the first 24 hours of a fire event or result in a delay in excess of 10 minutes for

performing required actions necessary within 1 hour.

The issue screened to Green, or very low safety significance, in task 2.5.5 of the phase 2 analysis because a safe shutdown success path was maintained through temporary ventilation, temperature monitoring, and operator manual actions. This finding did not have a cross-cutting aspect because it was determined to be a legacy issue and was considered to not be indicative of current licensee performance.

Inspection Report# : [2015007](#) (*pdf*)

**Significance:**  Jul 24, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to identify degraded conditions associated with the Unit 1 and Unit 2 RWST and AFWST panels.**

The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” because PSEG did not promptly identify and correct conditions adverse to quality. Specifically, PSEG did not promptly identify and correct degraded conditions associated with the Unit 1 and Unit 2 auxiliary feedwater storage tank (AFWST) and refueling water storage tank (RWST) instrumentation panels. PSEG entered the associated issues into their corrective action program (CAP) as notifications 20654991, 20654996, 20656136, 20657114, 20657115, and 20657117. PSEG’s short-term corrective actions included installing bolts/plugs on the Unit 1 RWST panel 378-1 and unplugging the failed fan in Unit 1 AFWST panel 802-1.

The team determined that the inadequate identification and resolution of the conditions adverse to quality is a performance deficiency that was within PSEG’s ability to foresee and correct. The finding is associated with the Mitigating Systems cornerstone and is more than minor because if left uncorrected it could lead to a more significant safety concern. Specifically, if left uncorrected, the continued exposure to external environmental elements and/or existing internal degraded conditions could potentially result in loss of level indication, non-conservative level indication, and/or loss of low level alarm functions. 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, the team determined that the finding is of very low safety significance (Green), because the finding was a deficiency affecting the design or qualification of a mitigating system, structure, or component (SSC), where the SSC maintained its operability.

Inspection Report# : [2014007](#) (*pdf*)

**Significance:**  Mar 31, 2014

Identified By: NRC

Item Type: FIN Finding

**Failure to take adequate corrective actions following a PDP failure to couple-on-demand event.**

The inspectors identified a Green FIN associated with Unit 1 for PSEG’s failure to take adequate corrective actions in accordance with procedure LS-AA-125, “Corrective Action Program,” Attachment 1 guidance following a PDP failure to couple-on-demand event, and to preclude subsequent failures during other couple-on-demand events and additional unplanned PDP unavailability. PSEG entered this issue into their CAP, implemented a compensatory measure, and initiated actions to correct the condition causing the failure to couple events.

The performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and affected its objective to ensure the availability and reliability of systems (safe shutdown charging cross-connect) that respond to initiating events (fire) to prevent undesirable consequences

(i.e., core damage). The inspectors determined that the finding was very low safety significance as the Unit 2 reactor would have been able to reach and maintain safe shutdown. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Resolution, in that PSEG did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, PSEG did not take adequate corrective actions in response to a PDP failure-on-demand event in February 2013 to preclude several additional unexpected PDP failure-on-demand events which resulted in additional unplanned unavailability.

Inspection Report# : [2014002](#) (*pdf*)

## Barrier Integrity

**Significance:**  Mar 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Ensure Adequate Negative Differential Pressure During Fuel Movements**

The inspectors identified a Green NCV of TS 3.9.12, "Fuel Handling Area Ventilation System," when PSEG did not suspend Unit 1 fuel movement operations when the fuel handling area ventilation system was inoperable. Specifically, differential pressure exceeded its alarm setpoint, and at times, was positive during irradiated fuel movements. Once aware of the issue, PSEG immediately suspended fuel movement, placed fuel assemblies in a safe condition, and entered the issue in their CAP as notifications 20677427 and 20678063.

The issue was determined to be more than minor since it affected the configuration control/barrier performance attribute of the Barrier Integrity cornerstone and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was screened using IMC 0609, Attachment 4 and Appendix A, Exhibit 3.C for Barrier Integrity screening questions involving the spent fuel pool building. Since the finding only represented a degradation of the radiological barrier function provided for the spent fuel pool, the finding screened to Green. This finding had a cross-cutting aspect in Human Performance, Procedure Adherence, in that individuals follow processes, procedures, and instructions. Specifically, PSEG operators did not follow alarm response and general operating procedures, did not use human error reduction techniques with respect to receipt of multiple low FHB D/P alarms, and manipulated irradiated fuel when not appropriately authorized and directed by procedures.

Inspection Report# : [2015001](#) (*pdf*)

**Significance:**  Dec 31, 2014

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Procedural Non-Compliance Resulted in Low Temperature Overpressure Relief Lifting**

A self-revealing, Green NCV of TS 6.8.1, "Procedures and Programs," was identified when PSEG did not correctly implement procedures associated with Safeguard Equipment Control (SEC) surveillance testing during solid reactor coolant system (RCS) operations. Consequently, this resulted in lifting a low temperature over-pressure protection valve during solid pressurizer operations. PSEG immediately stabilized reactor pressure, completed a prompt investigation and an apparent cause evaluation, submitted a Special Report to the NRC in accordance with TS 6.9.2, and entered this in their CAP (20665897).

Non-compliance with TS 6.8.1 procedures was a performance deficiency. This issue was determined to be more than minor because it was associated with the human performance attribute of the Barrier Integrity cornerstone, and adversely affected its objective to provide reasonable assurance that physical design barriers 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 procedures resulted in an RCS pressure transient that caused a protective relief valve to lift. 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, Procedure Adherence, in that individuals are expected to follow processes, procedures, and work instructions. Specifically, PSEG operators did not follow procedures nor review procedures before work to validate appropriateness and timing.

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

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Improper Risk Assessment and Risk Management Actions for a Reheater Drain Valve**

A self-revealing, Green NCV of 10 CFR 50.65(a)(4) was identified when PSEG did not properly assess and manage risk on Salem Unit 1 during an evolution with the potential to cause a reactivity change and overpower event. Specifically, while working on a moisture separator reheater (MSR) drain valve, it failed closed, reduced MSR reheat efficiency, led to turbine control valves opening further, and resulted in an overpower event. Consequently, this resulted in violating the thermal power limit in license condition 2.C.(1). PSEG took actions in accordance with procedures to place the valve in manual and lower power to restore it within the license limit. Additionally, they classified this as a reactivity event, entered it in their corrective action program, and performed an apparent cause evaluation.

The issue was more than minor since it was associated with the configuration control attribute of the barrier integrity and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the system alignment was impacted during maintenance, resulting in an overpower event. It was also similar to IMC 0612, Appendix E, Example 8.a. The finding was then evaluated using IMC 0609, Attachment 4 and Appendix A, Exhibit 3, where it screened to Green since it was only associated with the fuel cladding barrier. The finding was determined to have a cross-cutting aspect in Human Performance, Avoid Complacency, in that individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk even while expecting successful outcomes. Individuals are expected to consider potential undesired consequences and implement appropriate error reduction tools. Specifically, PSEG staff relied on past successes and assumed conditions working on this and similar drain valves and did not perform adequate, successive activity reviews when the valve exhibited unexpected responses.

Inspection Report# : [2014004](#) (*pdf*)

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## **Emergency Preparedness**

**Significance:**  Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Seismic EAL Scheme**

The inspectors identified a Green NCV of 10 CFR 50.54(q)(2) when PSEG did not maintain an adequate emergency classification and action level scheme that met the planning standards of 10 CFR 50.47(b). Specifically, PSEG did not establish an effective emergency plan with respect to declaring an Alert for seismic activity in excess of an operating basis earthquake (OBE), specifically vertical acceleration. PSEG entered this issue into their CAP as notification

20691160 and developed a temporary Operations standing order.

The issue was determined to be more than minor since it was associated with the procedure quality attribute of the Emergency Preparedness cornerstone, and adversely affected its objective to ensure that licensees are capable of implementing adequate measures to protect the health and safety of the public in the event of radiological emergency. Specifically, PSEG would not declare on Alert based on exceeding their OBE without actuation of the Hope Creek seismic switch. The issue was reviewed in accordance with IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued September 26, 2014, where it screened to very low safety significance (Green) since the seismic Alert emergency action level (EAL) had been rendered ineffective such that it would not be declared for seismic activity for the OBE vertical acceleration level. The inspectors determined this finding has a cross-cutting aspect in the area in Problem Identification and Resolution, Operating Experience, in that the organization systematically and effectively collects, evaluates and implements relevant external operating experience in a timely manner. The inspectors determined that PSEG staff did not thoroughly evaluate NRC Information Notice (IN) 2012-25, Performance Issues with Seismic Instrumentation and Associated Systems for Operating Reactors, published on February 1, 2013. Specifically, PSEG initiated CAP notification 20594195 in response to IN 2012-025, and took credit for previous actions completed to adjust SC.OP-AB.ZZ-0004, "Earthquake," but did not account for the vertical direction ground motion acceleration differences between Salem and Hope Creek.

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

## Occupational Radiation Safety

**Significance:** G Jun 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### Inadequate HRA Controls

The inspectors identified a Green NCV of TS 6.12, "High Radiation Area," when PSEG did not apply appropriate controls to high radiation areas. Specifically, the Unit 1 and 2 reactor cavities in containment, which are areas that exceed 1.0 rem/hour at 30 centimeters, were not properly controlled to prevent unauthorized personnel access. PSEG entered this issue in their CAP as notification 20682903 and installed six foot high scissor fences around each reactor cavity.

The issue was determined to be more than minor since it was associated with the program and process attribute of the Occupational Radiation Safety cornerstone, and adversely affected its objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, high radiation areas with dose rates greater than 1.0 rem/hour at 30 centimeters were not properly controlled to prevent unauthorized personnel access. It was also similar to IMC 0612, Appendix E, example 6.g, in that access to a posted high radiation area (HRA) was not controlled in accordance with site TSs, a HRA actually existed, and it was not properly barricaded. The finding was then evaluated using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, where it screened to very low safety significance (Green) since it was not associated with an as low as is reasonably achievable (ALARA) issue, did not involve an overexposure, did not constitute a substantial potential for overexposure, and did not compromise PSEG's ability to assess dose. The inspectors determined this finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency, in that individuals recognize and plan for the possibility of latent problems, even while expecting successful outcomes. Specifically, PSEG was not sufficiently aware of latent deficiencies in HRA access control given opportunities to identify the inadequate HRA controls when performing

containment entries during normal plant operation and when routinely establishing the reactor cavities as locked high radiation areas following refueling outages.

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

**Significance:**  Dec 31, 2014

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Implement TS Locked High Radiation Area Controls**

The inspectors identified NCV of very low safety significance (Green) associated with failure to implement TS 6.12.2 access controls for a High Radiation Area (HRA) exhibiting accessible radiation dose rates exceeding 1 rem/hr at 30 cm. Specifically, on October 28, 2014, NRC inspectors found the access door to the Unit 1 Containment Regenerative Heat Exchanger Room unlocked and unguarded, and the area exhibited accessible radiation dose rates of up to 1.4 rem/hr at 30 cm. PSEG immediately locked access to this area and entered this issue into its CAP (Notification 20667323).

The failure to establish and implement TS 6.12 HRA access controls is a performance deficiency (PD) which was within PSEG's ability to foresee and correct and should have been prevented. The PD was determined to be more than minor because, if left uncorrected, the PD had the potential to lead to a more significant safety concern if personnel were exposed to elevated radiation dose rates. Further, the PD 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 from radiation exposure. The finding was assessed using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," and was determined to be of very low safety significance (Green) because the finding did not involve: (1) As-Low-As-Reasonably

Achievable (ALARA) planning and controls; (2) a radiological overexposure; (3) a substantial potential for an overexposure; or (4) a compromised ability to assess dose. This finding was associated with the Resolution aspect of the Problem Identification and Resolution cross-cutting area in that PSEG did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, PSEG did not repair a long standing broken High Radiation Area access door lock resulting in extended use of an alternate lock and chain remedy that could not be readily verified in the locked condition and led to human error in not successfully locking the door from prior egress.

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

## Miscellaneous

**Significance:** N/A May 22, 2015

Identified By: NRC

Item Type: FIN Finding

### **Biennel PI&R Overall Assessment**

The inspectors concluded that PSEG was generally effective in identifying, evaluating, and resolving problems. PSEG personnel identified problems, entered them into the corrective action program (CAP) at a low threshold, and prioritized issues commensurate with their safety significance. The inspectors concluded that PSEG adequately identified, reviewed, and applied relevant industry operating experience to Salem operations, and completed self-assessments and audits as required. PSEG adequately screened issues for operability and reportability, and generally performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that PSEG typically implemented corrective actions (CAs) that addressed problems identified in the CAP in a timely manner. However, the inspectors identified a violation of NRC requirements in the area of effectiveness of corrective actions.

Based on interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual CAP and employee concerns program issues, the inspectors did not identify any indications that site personnel were unwilling to raise safety issues through various available means.  
Inspection Report# : [2015008](#) (*pdf*)

Last modified : September 18, 2015