

Salem 1

1Q/2016 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance: G Mar 31, 2016
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Failure to Correct Chiller Failures due to Gasket Leakage
Draft
Inspection Report# : [2016001](#) (*pdf*)

Significance: G Dec 31, 2015
Identified By: Self-Revealing
Item Type: NCV Non-Cited Violation
Improper PM Deletion Resulted in Plant Shutdown Required by TSs
A self-revealing Green NCV of TS 6.8.1, “Procedures and Programs,” as described in Regulatory Guide 1.33, Revision 2, February 1978, was identified when PSEG did not maintain an appropriate preventive maintenance (PM) schedule for Salem containment fan cooling unit (CFCUs). Specifically, PSEG did not incorporate vendor recommendations and industry operating experience (OE) in 2003 when modifying PM schedules to delete motor air gap measurements for CFCUs. The 14 CFCU subsequently failed to start in low speed for scheduled testing on March 8, 2015. PSEG entered this in their Corrective Action Program (CAP) as notification 20681031, replaced the 14 CFCU motor, completed an apparent cause evaluation (ACE), and re-initiated CFCU motor air gap measurement PMs.

PSEG’s inadequate analysis of PM deletion was a performance deficiency within PSEG’s ability to correct and should have been prevented. This issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects its cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that the finding was of very low safety significance (Green) in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, 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. The inspectors determined that there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. Specifically, in accordance with 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# : [2015004](#) (*pdf*)

Significance: G Dec 31, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Inadequate Post Maintenance Testing on OTDT Channels

A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion XI, “Test Control,” and associated NCV of TS 3.3.1.1 was identified, with two examples, for not ensuring that all testing required to demonstrate that nuclear instrumentation (NI) would perform satisfactorily in service was identified and performed. As a result, inoperable Over-Temperature Delta-Temperature (OTDT) channels were not placed in the tripped condition within the timeframe required by TS LCO 3.3.1.1, on January 20 and April 21, 2015 respectively. PSEG entered this issue in their CAP and developed corrective actions to provide improved retest requirements for all maintenance performed on the NI system.

The inspectors determined that the failure to ensure the NI channels were operable upon restoration to service was a performance deficiency. The performance deficiency is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected its cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences. Inspectors evaluated the finding’s significance in accordance with IMC 0609, Attachment 4 and Appendix A, and determined that the finding did not affect a single reactor protection system (RPS) trip signal to initiate a reactor scram AND the function of other redundant trips or diverse methods of reactor shutdown, did not involve control manipulations that unintentionally added positive reactivity and did not result in a mismanagement of reactivity by operator(s). Therefore, the finding screened to Green, or very low safety significance. The finding has a cross-cutting aspect in the area of Human Performance, Documentation, because PSEG did not ensure that plant activities were effectively governed by comprehensive, high-quality, programs, processes and procedures. Specifically, subsequent to completion of calibration and replacement work and PMT per I&C surveillance procedures, work packages did not adequately address or specify activities related to verifying potentially affected RPS indications.

Inspection Report# : [2015004](#) (*pdf*)

Significance: G Sep 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure To Establish Measures for the Selection and Review for Suitability of a TDAFW Room Cooler Temperature Switch

A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion III, “Design Control,” was identified when PSEG selected a temperature control switch for the auxiliary feedwater (AFW) pump area room cooler that was not suitable for its application. Specifically, installation of a temperature control switch with an inadequate reset deadband resulted in excessive cycling of the room cooler, failure of its associated turbine-driven AFW (TDAFW) pump enclosure inlet damper to fully open, and subsequent inoperability of the TDAFW pump. PSEG entered this issue into their corrective action program (CAP), performed immediate repairs to the failed damper, performed an apparent cause evaluation (ACE), and created corrective actions to replace the temperature switches on both units.

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. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, and screened to Green. Specifically, this finding was a design deficiency whereby the TDAFW pump did not maintain operability; however, this finding did not represent a loss of system or function, and TDAFW did not exceed its Technical Specification (TS) allowed outage time. 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 complete corrective actions in a timely manner to resolve and correct excessive damper cycling, as identified in 2013; did not ensure that work order operation deferrals to address excessive cycling were minimized; and did not address the fundamental cause of excessive damper cycling while an interim corrective action was established to minimize excessive damper cycling. Inspection Report# : [2015003](#) (*pdf*)

Significance:  Sep 30, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Correct Chronic Chiller Relief Valve Freon Leaks

A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” was identified when the 13 chiller tripped on freeze protection due to insufficient refrigerant. Specifically, timely corrective actions were not implemented in response to repetitive Freon leaks that ultimately rendered the 13 chiller inoperable. In response, PSEG initiated a prompt investigation, conducted troubleshooting and repairs, entered the issue in their CAP, and completed an ACE.

The issue was determined to be more than minor since it affected 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 (i.e., core damage). The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, and screened to Green since it was not a qualification or design deficiency, did not represent a loss of system or function, and did not exceed its TS allowed outage time. The issue was determined to have a cross-cutting aspect in Human Performance, Design Margins, in that a licensee organization operates and maintains equipment within design margins, and places special attention on maintaining safety related equipment. Specifically, PSEG did not minimize a long-standing equipment issue nor carefully maintain its operating margin.

Inspection Report# : [2015003](#) (*pdf*)

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:  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, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Untimely Identification and Correction of Unsatisfactory Control Room Ventilation Charcoal Testing
DRAFT

Inspection Report# : [2016001](#) (*pdf*)

Significance:  Dec 31, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

Inadequate Maintenance Effectiveness of Control Room Ventilation Radiation Monitors

Inspectors identified a Green NCV of 10 CFR 50.65(a)(2) when Control Area Ventilation (CAV) radiation monitor performance was not being effectively controlled through appropriate preventive maintenance. Specifically, there were repetitive foil issues and a repeat maintenance preventable functional failure (RMPFF) during the monitoring period. PSEG placed the system under (a)(1) and entered this in their CAP.

The issue was more than minor since it was associated with the 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 in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 3, where it screened to Green since it only represented a degradation of the radiological barrier function provided for the control room. The finding had a cross-cutting aspect in Human Performance, Conservative Bias, in that licensees take timely action to address degraded conditions commensurate with their safety significance and take a conservative approach to decision making.

Inspection Report# : [2015004](#) (*pdf*)

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:  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*)

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 : July 11, 2016