



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

April 28, 2015

Mr. Robert Braun  
President and Chief Nuclear Officer  
PSEG Nuclear LLC - N09  
P.O. Box 236  
Hancocks Bridge, NJ 08038

**SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 –  
NRC INTEGRATED INSPECTION REPORT 05000272/2015001 AND  
05000311/2015001**

Dear Mr. Braun:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Salem Nuclear Generating Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 16, 2015, with Mr. John Perry, Salem Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations, consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest the non-cited violations in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Salem Nuclear Generating Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding, or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Salem Nuclear Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from

the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Glenn T. Dentel, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Docket Nos. 50-272, 50-311  
License Nos. DPR-70, DPR-75

Enclosure: Inspection Report 05000272/2015001 and 05000311/2015001  
w/Attachment: Supplementary Information

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the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

Docket Nos. 50-272, 50-311

License Nos. DPR-70, DPR-75

Report Nos. 05000272/2015001 and 05000311/2015001

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Salem Nuclear Generating Station, Units 1 and 2

Location: P.O. Box 236  
Hancocks Bridge, NJ 08038

Dates: January 1, 2015 through March 31, 2015

Inspectors: P. Finney, Senior Resident Inspector  
A. Ziedonis, Resident Inspector  
E. Burket, Emergency Preparedness Inspector  
R. Barkley, Senior Project Engineer  
L. Dumont, Reactor Inspector  
T. Hedigan, Operations Engineer

Approved By: Glenn T. Dentel, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

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## SUMMARY

Inspection Report (IR) 05000272/2015001, 05000311/2015001; 01/01/2015 – 03/31/2015; Salem Nuclear Generating Station Units 1 and 2; Operability Determinations and Functionality Assessments, Post-Maintenance Testing.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified two non-cited violations (NCVs) of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 19, 2013. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

### Cornerstone: Mitigating Systems

- Green. 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 notifications 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. Using IMC 0609, Appendix A, 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. [P.2] (Section 1R19)

### Cornerstone: Barrier Integrity

- Green. 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. [H.8] (Section 1R15)

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent. On March 7, the unit was reduced to 50 percent power in support of 12 steam generator feedpump (SGFP) corrective maintenance. The unit returned to 100 percent power on March 10. On March 12, the unit was reduced to approximately 60 percent power in response to a control oil leak on the 12 SGFP. On March 15, the unit was shut down to comply with Technical Specifications (TSs) for the 14 containment fan coil unit (CFCU) that had exceeded its allowed outage time. A reactor startup was commenced on March 22. The unit reached 98 percent power at the end of the inspection period.

Unit 2 began the inspection period at 100 percent. On February 4, Unit 2 was reduced to 60 percent power in response to a main condenser tube leak. The unit returned to 100 percent power on February 7. The unit remained at or near 100 percent power for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 3 samples)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PSEG's preparations during impending extended cold conditions the week of January 5 and an impending blizzard on January 26. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during these adverse weather conditions. The inspectors walked down the service water (SW) intake structure, circulating water intake structure, Unit 3 gas turbine engine and control house, SW accumulators, freshwater pumphouse, effluent radiation monitors, and Unit 1 and 2 auxiliary buildings. The inspectors verified that operator actions defined in PSEG's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope



During the week of February 3, the inspectors performed a review of PSEG's readiness for the onset of seasonal grassing. The review focused on the SW intake structure. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure PSEG personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including PSEG's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected system to ensure station personnel identified issues that could challenge the operability of the systems during grassing conditions.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 2, auxiliary feedwater (AFW) during degraded conditions associated with 24 steam generator level control valve on January 26
- Unit 2, steam dumps during megawatt recovery on February 9
- Common, AFW backup supply water on February 24

The inspectors selected these systems based on their risk-significance relative to the Reactor Safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), TSs, work orders, notifications, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PSEG staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On March 18, the inspectors performed a complete system walkdown of accessible portions of the Unit 1 CFCU system to verify the existing equipment lineup was correct.

The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure PSEG appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 6 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that PSEG controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded or inoperable fire protection equipment, as applicable, in accordance with procedures and discussed with station personnel the repair plans for degraded equipment.

- Unit 1, Auxiliary building auxiliary area (Fire Zones 125 and 126) on January 16
- Unit 1, Service water intake structure, (Fire Zones 147 and 149) on February 19
- Unit 1, Diesel fuel oil storage tank area (Fire Zones 85 through 87) on February 25
- Unit 1, Containment during forced outage (Fire Zones 103 and 104) on March 19
- Unit 2, Battery rooms (Fire Zone 118) on January 12
- Unit 2, 2B and 2C emergency diesel generator (EDG) rooms (Fire Zones 70, 89, and 90) on February 27

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on January 28, that involved a fire in Unit 2, Fire Zone 145. The inspectors evaluated the readiness of the

plant fire brigade to fight fires. The inspectors verified that PSEG personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with PSEG's fire-fighting strategies.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11Q – 1 sample)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on January 27 and February 10, which included a requalification examination and a scenario covering the following major events: reactor coolant system leak and loss of coolant accident. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed the emergent downpower for Unit 2 main condenser tube leakage on February 4. Additionally, the inspectors observed operator performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q –1 sample)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule (MR) basis documents to ensure that PSEG was identifying and properly evaluating performance problems within the scope of the MR. For each sample selected, the inspectors verified that the SSC was properly scoped into the MR in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by PSEG staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that PSEG staff was identifying and addressing common cause failures that occurred within and across MR system boundaries.

- Common, 10 CFR 50.65(a)(3) evaluation on February 19

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that PSEG performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the Reactor Safety cornerstones. As applicable for each activity, the inspectors verified that PSEG personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When PSEG performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements

and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unit 1, Yellow risk for 11 component cooling water heat exchanger planned maintenance on January 20
- Unit 1, Yellow risk for demineralized water storage tank isolation for non-safety-related AFW suction piping tie-in on March 2
- Unit 1, 12 SGFP elevated vibration and adverse condition monitoring during planned load reduction on March 7
- Unit 2, Emergent troubleshooting of erratic main generator automatic voltage regulator on January 5
- Unit 2, Overpower event during 26 feedwater heater tuning on January 13
- Unit 2, Yellow risk for 2A EDG planned maintenance on February 29

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- Unit 1, Fuel moves with fluctuating building differential pressure on January 16
- Unit 1, 13 CFCU operable but degraded evaluation on March 20
- Unit 2, 25 SW traveling water screen following valve misposition on January 29
- Unit 2, Auxiliary alarm system failure on February 2
- Common, control room emergency air conditioning system during 1B vital instrument bus failure on February 2
- Common, Quadrant power tilt ratio (QPTR) alarm setpoint control on February 19
- Common, Baldor EDG performance testing on February 19

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to PSEG's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by PSEG. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction. 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.

Description. During the week of January 12, 2015, PSEG was moving irradiated fuel assemblies in the Unit 1 Fuel Handling Building (FHB) in support of fuel sipping to identify fuel leaks. On January 15, PSEG's nuclear services department wrote notification 20675874 documenting that they "continued to experience differential pressure (D/P) issues in the Salem 1 FHB," that three delays had occurred that day due to swings from approximately -0.1 to 0 inches water, and that "fuel handling is conservatively halted until D/P settles and permission is granted by the control room supervisor." It finished stating "due to the nature of the D/P instability, fuel handling is less than predictable." On the morning of January 16, inspectors went to the FHB during irradiated fuel movements and observed D/P gauge 1PD6531 fluctuate between -0.1" and 0" water and also become positive for a brief period. After contacting the Operations shift manager and while still on the phone, both the inspectors and the shift manager observed FHB D/P fluctuate and become positive again. The shift manager immediately contacted the FHB supervisor and suspended irradiated fuel movements. The inspectors then went to the control room and noted that the control room supervisor was monitoring FHB D/P gauge on a computer via a camera in the FHB since the FHB D/P alarm was in. The inspectors confirmed with operators that the FHB low D/P alarm had come in and out during the shift. Subsequent to this suspension, operators returned two irradiated fuel assemblies to their safe, original pool location. PSEG stopped further fuel movements until the low D/P alarm could be restored to service and other sources of the low FHB D/P were identified and corrected. PSEG captured this issue in their CAP as 20677427 and 20678063.

TS 3.9.12 covers fuel handling area ventilation system operability and requires that it be capable of "maintaining slightly negative pressure in the FHB" during movement of irradiated fuel within the FHB. Non-compliance requires that all operations involving movement of fuel within the storage pool be suspended until the fuel handling area ventilation system is restored to operable status.

Alarm response procedure S1.OP-AR.ZZ-0011, "Control Console 1CC1," Revision 53, for the FHB low air D/P uses 1PD6531 with a setpoint of -0.160" water. Step 3.3 states that "If FHB D/P cannot be maintained at a slight negative pressure with respect to atmospheric pressure (valid alarm), then the Fuel Handling Building Ventilation System is inoperable, refer to TS 3.9.12." Step 3.4 states "if the FHB Ventilation System is inoperable then ensure that there is no movement of irradiated fuel within the Fuel Handling Building."

S1.OP-IO.ZZ-0010 (IOP-10), "Spent Fuel Manipulations," Revision 23, step 3.17 states, in part, "Operations involving movement of fuel within the storage pool are required to be suspended for any of the following: the Fuel Handling Area Ventilation System becomes inoperable." Step 3.7 states that "the Fuel Handling Building is maintained at a slight negative pressure with respect to atmosphere pressure (T/S 4.9.12.a). The BLDG AIR D/P LO Alarm Bezel OR local indicator 1PD6531 may be used to continuously monitor

xFHB D/P.” Step 3.1 states that “this procedure shall be in effect when Spent Fuel Pool Manipulations (movement of irradiate fuel) are initiated and shall remain in effect until all Spent Fuel Pool Manipulations are completed.” Attachment 3 step 1.2(c) requires that “BLDG AIR D/P LO alarm is clear OR the local indicator 1PD6531 is being used to continuously monitor FHB D/P.” Given that the low D/P alarm came in and out during the shift, continuous monitoring of the D/P gauge was required. Inspector observations support that this continuous monitoring was not in effect. Since FHB D/P was not maintained at a slight negative pressure, the inspectors concluded that the fuel building area ventilation system was inoperable and that operations involving movement of fuel within the storage pool should have been suspended.

The inspectors determined that given the D/P observations during irradiated fuel movements, operator confirmation that the low D/P alarm had come in and out during the shift, the procedural requirements of both the alarm response and IOP-10 for D/P, and the inability of the control room supervisor to continuously monitor FHB D/P, that Unit 1 fuel handling area ventilation system was inoperable the predominant amount of the day and, therefore, the TS 3.9.12 requirement to immediately cease fuel movement was applicable but not followed.

Analysis. Failure to adhere to TS 3.9.12 was a performance deficiency. 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 (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the radiological barrier functionality of the fuel handling building was degraded based on D/P challenges. 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 IOP-10. (H.8)

Enforcement. TS 3.9.12 states, in part, that “the fuel handling area ventilation system shall be “ [and] “capable of maintaining slightly negative pressure in the Fuel Handling Building” “during movement of irradiated fuel within the Fuel Handling Building. With no Fuel Handling Area Ventilation System OPERABLE, suspend all operations involving movement of fuel within the storage pool until the Fuel Handling Area Ventilation System is restored to OPERABLE status.” Contrary to this, on January 16, 2015, PSEG conducted fuel movements with the fuel handling area ventilation system not maintaining slightly negative pressure. Once aware of the issue, PSEG immediately suspended fuel movement and placed fuel assemblies in a safe condition. Because this issue was of very low safety significance and was entered in PSEG’s CAP as notifications 20677427 and 20678063, this violation is being treated as an NCV in accordance with section 2.3.2 of the NRC’s Enforcement Policy. **(05000272/2015001-01, Failure to Ensure Adequate Negative Differential Pressure During Fuel Movements)**

1R18 Plant Modifications (71111.18 – 1 sample).1 Permanent Modificationsa. Inspection Scope

The inspectors evaluated a modification to install a non-safety related, diesel-driven AFW pump, implemented by design change packages 80106028, "Unit 1 and 2 Spare Non Safety-Related Auxiliary Feedwater System," and 80109929, "NSR Auxiliary Feedwater Pump for MSPI Recovery." The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors walked down portions of the system piping and components, and interviewed engineering personnel to understand the intended margin improvements in the station PRA model MSPI associated with the AFW system.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)a. Inspection Scope

The inspectors reviewed the post maintenance tests (PMTs) for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- Unit 1, 12 SGFP after shim removal and wire repairs on March 10
- Unit 1, 14 CFCU following motor replacement on March 19
- Unit 1, 12 auxiliary building ventilation exhaust backdraft damper failure to close on March 26
- Unit 2, 25 CFCU low speed breaker after failure to close on January 15
- Unit 2, Valve 22AF21 pressure override after indication discrepancy on February 6
- Unit 2, Valve 25SW58 stroke timing following corrective maintenance on March 11
- Common, DWST following substation #4 failure on February 23

b. Findings

Introduction. 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 HELB and MELB barriers being unsecured without implementing the associated station process.



Description. In NRC Inspection Report 2013-005, inspectors documented a Green NCV of TS 6.8.1 when PSEG had not properly implemented HELB barrier controls in accordance with CC-AA-201, "Plant Barrier Control," Revision 4, during maintenance activities that affected the performance of safety-related equipment. One of the examples involved maintenance on a valve inside a Unit 1 service water vault. During that activity, technicians had left a watertight door opened without a dedicated attendant. When questioned, the technicians explained that since they were doing maintenance, they were exempt from requirements associated with barrier control. A review of the evaluation cited on a door placard revealed that the door had two design functions: to protect equipment outside the vault from a MELB of the service water piping inside the vault, and to protect equipment inside the vault from an outside HELB event.

During the first quarter of 2015, there were four examples of HELB/MELB doors being left open without implementing the associated station process. On February 2, during a walkdown of the same Unit 1 mechanical penetration area, inspectors identified a service water vault door fully open without an attendant or plant barrier impairment (PBI). Two maintenance technicians inside the bay were actively engaged in valve maintenance. The inspectors observed this condition for over seven minutes before reporting it to Operations. The posting on the door, revised after the previous NCV, requires Operating Shift permission to ensure compliance with OP-SA-108-115-1001, "Operability Assessment and Equipment Control Program," before the door can be maintained open. In this case, permission had not been obtained. When the technicians were questioned on why they had left the door open, they replied that it was allowed to be open for maintenance activities. This was the same response that had been obtained in the previous NCV. PSEG closed and latched the door and entered this in their CAP as notification 20677643. On March 2, a PSEG fire protection operator identified the HELB door between the Unit 2 mechanical and electrical penetration areas was unlatched and ajar. PSEG closed and latched the door and entered this in their CAP as notification 20680283. On March 4, inspectors discovered a Unit 2 service water vault with its HELB/MELB door fully open. A PBI had originally been incorporated in the work but had since been removed. When inspectors questioned the sole technician working in the room, he was not aware of the barrier requirements. PSEG closed and latched the door and entered this in their CAP as notification 20680680. Finally, on March 26, inspectors felt air blowing out of an access panel on the 13 turbine-driven auxiliary feedwater HELB enclosure. When informed, an equipment operator identified that two latches were not in the closed position, repositioned them to secure the panel, and entered this in their CAP as notification 20683127.

The inspectors reviewed the CAP items associated with the 2013 NCV. Notification 20635656 revised OP-SA-108-115-1001, Exhibit 6, to align with NRC RIS 2001-09. Specifically, the revision prohibited the blocking open of HELB/MELB barriers without implementing compensatory measures to provide equivalent protection or by removing the hazard. Notification 20633614 resulted in a crew clock reset and reviewed and confirmed that the service water HELB door signage and planning package were adequate. Notification 20635652 included two corrective actions: an extent of condition review for the previous three years and the same procedural revision discussed in notification 20635656 above. There were also two completed action items: a site-wide communication to ensure staff awareness of the HELB/MELB barrier issue and to examine the site's implementation of NRC RISs. While the site-wide communication discussed the turbine-driven auxiliary feedwater HELB example from the 2013 NCV, it

did not discuss the service water vault example. Overall, the inspectors determined that PSEG had not implemented adequate corrective actions that would ensure adherence to the existing HELB barrier process as evidenced by continuance of staff behaviors and assumptions.

Through inspector review of CAP products associated with the previous NCV, the highest level of evaluation completed had been a work group evaluation, defined by PSEG as a low-level evaluation. LS-AA-120, "Issue Identification and Screening Process," Attachment 3, says to "consider performing at least an apparent cause evaluation for all externally identified significance level 3 or above issues," and "consider a quick human performance investigation for conditions that involve an active Human Performance error." Attachment 2 identifies an NRC NCV as a significance level 3 issue. The inspectors noted that neither an apparent cause evaluation nor a quick human performance investigation had been completed.

Analysis. Inadequate corrective actions in accordance with 10 CFR 50, Appendix B, Criterion XVI, was a performance deficiency. 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. Specifically, improper barrier controls could potentially affect the operating equipment lineup in the case of a HELB. 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, did not represent a loss of system or function, or represent an actual loss of function. Specifically, redundant trains were not impacted by the conditions.

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. [P.2]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this, PSEG did not implement adequate corrective actions from a Green NCV in the fourth quarter of 2013 associated with HELB/MELB barrier control as evidenced by similar barriers being uncontrolled in the first quarter of 2015. PSEG immediate corrective actions were to secure the affected barriers and enter these examples in their CAP as notifications 20677643, 20683127, 20680283, and 20680680. Because the finding was of very low safety significance and was entered in PSEG's CAP, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC's Enforcement Policy. **(NCV 05000272;311/2015/001-02, Inadequate Corrective Actions for HELB Barrier Controls)**

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)a. Inspection Scope

On March 15, Salem Unit 1 was shutdown to comply with TS 3.6.2.3 regarding the allowed outage time for the 14 CFCU. During the outage that ended March 23, the inspectors observed portions of the shutdown process, repair activities, and immediate corrective actions and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Tracking of startup prerequisites, walkdown of the primary containment to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 7 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and PSEG procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- Unit 1, 13 AFW pump quarterly (IST) on January 30
- Unit 2, Axial flux difference and overtemperature delta temperature on January 27
- Unit 2, 2B EDG monthly on February 2
- Unit 2, Quadrant power tilt ratio on February 5
- Unit 2, 23 overtemperature delta temperature channel calibration on March 10
- Unit 2, Reactor coolant system leakage (RCS) on March 30
- Common, Dose equivalent iodine on March 30

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

PSEG implemented various changes to the Salem Emergency Action Levels (EALs), Emergency Plan, and Implementing Procedures. PSEG had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EALs, Emergency Plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR 50 Appendix E.

The inspectors performed an in-office review of all EAL and Emergency Plan changes submitted by PSEG as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential reductions in effectiveness of the Emergency Plan. This review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

Emergency Preparedness Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on January 12 and February 10, which required emergency plan implementation by an operations crew. PSEG planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that PSEG evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151)

###### .1 Safety System Functional Failures (2 samples)

###### a. Inspection Scope

The inspectors sampled PSEG's submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of January 1, 2014 through December 31, 2014. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed PSEG's operator narrative logs, operability assessments, MR records, maintenance work orders, condition reports, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

###### b. Findings

No findings were identified.

###### .2 RCS Specific Activity and RCS Leak Rate (4 samples)

###### a. Inspection Scope

The inspectors reviewed PSEG's submittal for the RCS specific activity and RCS leak rate performance indicators for both Unit 1 and Unit 2 for the period of January 1, 2014 through December 31, 2014. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements of RCS leakage, and compared that information to the data reported by the performance indicator. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing an RCS sample.

###### b. Findings

No findings were identified.

##### 4OA2 Problem Identification and Resolution (71152)

###### .1 Routine Review of Problem Identification and Resolution Activities

###### a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that PSEG entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and

addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended condition report screening meetings.

b. Findings

No findings were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

.1 Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that PSEG made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR 50.72. The inspectors reviewed PSEG's follow-up actions related to the events to assure that PSEG implemented appropriate corrective actions commensurate with their safety significance.

- Unit 2, downpower to 60 percent power following main condenser tube leaks on February 4

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000311/2014-002-00: Manual Reactor Trip Due To A Partially Dropped Rod

a. Inspection Scope

On January 31, 2014, during the performance of monthly control rod surveillance, a power cable to control rod drive mechanism 1D2 experienced a short to ground while inserting control bank D fifteen steps. The short to ground caused a movable gripper fuse to open and 1D2 dropped from 220 to 166 steps. Operations entered TS 3.1.3.1.c for an inoperable control rod, which requires a power reduction to 75 percent within one hour, and compliance with TS 3.1.1.1 within one hour. Operations commenced a boration to reduce reactor power. During boration activities, the shutdown margin (SDM) was determined to be below the TS limit, thereby requiring a rapid boration. During rapid boration activities, operations subsequently determined that a manual trip was warranted, due to RCS average temperature approaching the minimum temperature for criticality. During the manual reactor trip, all the control rods fully inserted, therefore verifying control rod 1D2 was, in fact, trippable. PSEG determined that a 4-hour event

report was required pursuant to 10 CFR 50.72(b)(2)(iv)(B) for an unplanned reactor protection system actuation. The inspectors reviewed the LER, the associated causal analysis and corrective actions, interviewed PSEG staff, and walked down associated components. This LER is closed.

b. Findings

Inspectors documented a Green NCV of TS 6.8.1 associated with this issue in NRC Inspection Report 05000272;311/2014-003. The inspectors did not identify any new performance deficiencies during the LER review.

4OA6 Management Meetings

Exit Meeting Summary

On April 16, 2015, the inspectors presented the inspection results to Mr. John Perry, Salem Site Vice President, and other members of the PSEG staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION****KEY POINTS OF CONTACT**Licensee Personnel

J. Perry, Site Vice President  
 L. Wagner, Plant Manager, Salem  
 C. Banner, Emergency Preparedness Manager  
 P. Williams, Nuclear Simulator Training Instructor  
 S. Thomassen, Emergency Preparedness Station Manager  
 R. Cordrey, Operations Shift Manager  
 Z. Crawford, Nuclear Shift Supervisor

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**Open and Closed

05000272/2015001-01	NCV	Failure to Ensure Adequate Negative Differential Pressure During Fuel Movements (Section 1R15)
05000272;311/2015001-02	NCV	Inadequate Corrective Actions for HELB Barrier Controls (1R19)

Closed

05000311/2014002-00	LER	Manual Reactor Trip Due to a Partially Dropped Rod (Section 4OA3)
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**LIST OF DOCUMENTS REVIEWED**

\* Indicates NRC-identified

**Section 1R01: Adverse Weather Protection**Procedures

EP-AA-121, Emergency Response Facilities and Equipment Readiness, Revision 2  
 OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 11  
 SC.OP-AB.ZZ-0001, Adverse Environmental Conditions, Revision 17  
 FP-AA-016, Attachment 1, Fire Protection Operator-Nuclear Turnover Checklist, 01/25/2015

Notifications

20675927	20675964	20676336	20676338	20676391	20676422
20676543	20676563	20676764	20676779*	20676893*	20676911
20677670*	20680902	20680459	20680246	20634631	20675927
20679234	20450635	20679355	20679470	20679656	20679106
20678926	20678675	20678105	20678017	20678109	20678003
20675095	20674638	20674520	20675927	20675964	20676336
20676338	20676422	20676543	20676391	20676563	20677053
20676950	20675019	20675004	20675085	20675091	20675084
20675077	20674765	20674937	20674804	20674899	



Maintenance Orders/Work Orders  
 30262086                      30263214

Other Documents

Salem 1 Narrative Log, 01/06/2015 Day, 01/07/2015 Night, 02/19/2015 Night  
 Salem 2 Narrative Log, 01/02/2015 Day, 01/06/2015 Day, 01/08/2015 Day, 02/14/2015 Night,  
 02/20/2015 Night  
 ERO EP Note 2014-27, MET Tower Maintenance Outage, dated 01/05/2015

**Section 1R04: Equipment Alignment**

Procedures

OP-AA-108-101, Control of Equipment and System Status, Revision 7  
 S1.OP-ST.AF-0011, Auxiliary Feed Water Alternate Suction Source Verification Modes 1-3,  
 Revision 2  
 S2.OP-ST.AF-0011, Auxiliary Feed Water Alternate Suction Source Verification Modes 1-3,  
 Revision 2  
 S1.OP-SO.AF-0001, Auxiliary Feedwater System Operation, Revision 31  
 S2.OP-SO.AF-0001, Auxiliary Feedwater System Operation, Revision 39  
 S2.OP-ST.AF-0003, Inservice Testing - 23 Auxiliary Feedwater Pump, Revision 51  
 S2.OP-ST.AF-0004, Inservice Testing - Auxiliary Feedwater Valves, Revision 19  
 S2.OP-ST.AF-0008, Auxiliary Feedwater Valve Verification Modes 1-3, Revision 4  
 S2.RA-ST.AF-0004, Inservice Testing – Auxiliary Feedwater Valves Modes 1-6 Acceptance  
 Criteria, Revision 12

Notifications

20459297	20658443	20668369	20671842	20675314	20675315
20676718	20676884	20677083	20677096	20677191	20678279*
20678340	20679280	20679287	20679288	20679685*	20679686*
20679687*	20680159*	20681093*	20681935*	20681936*	20681938*
20688369					

Maintenance Orders/Work Orders

60118755      70099232      70167136      70171700      70173268

Drawings

205236, No.1 Unit Auxiliary Feedwater, Sheet 1, Revision 61  
 205336, No. 2 Unit Auxiliary Feedwater, Revision 51  
 205213, No. 1 & 2 Units Demineralized Water Make-Up, Sheet 5, Revision 51

Other Documents

Salem Unit 2 Dayshift Narrative Log for January 9, 2015  
 Salem 2 Narrative Log, 11/26/2014 Night, 01/23/2015 Night, 01/23/2015 Day, 01/24/2015 Day  
 and Night, 01/25/2015 Night, 01/27/2015 Day, 01/28/2015 Day, 01/30/2015 Night  
 S-C-AF-MDC-0445, Auxiliary Feedwater System Hydraulic Analysis, Revision 3  
 UFSAR Sections 7.7, 10.1, and 10.3

**Section 1R05: Fire Protection**

Procedures

S2.OP-SO.PC-0001, Switchgear and Penetration Areas Ventilation Operation, Revision 23  
 S2.OP-AR.ZZ-0001, Overhead Annunciators – Window A, Revision 55  
 FP-SA-003, Actions for Inoperable Fire Protection – Station, Revision 3  
 FP-AA-015, Compensatory Measure Firewatch Program, Revision 5  
 FP-AA-024, Fire Drill Performance, Revision 0  
 FRS-II-434, Salem Pre-Fire Plan Charging Pump, Spray Additive Tank Area, Revision 3  
 FRS-II-435, Salem Pre-Fire Plan Diesel Fuel Oil Storage Area, Revision 5  
 FRS-II-445, Salem Pre-Fire Plant Diesel Generator Area, Revision 11  
 LS-AA-120, Issue Identification and Screening Process, Revision 13  
 SC.FP-SV.ZZ-0058, Inspection of Class 1 Fire Doors & SR Areas for Transient Combustibles, Revision 20  
 SC.ER-PS.FP-001-A2, Salem Fire report – FHA, 12/11/2011  
 FP-AA-011, Control of Transient Combustible Material, Revision 3

Notifications

20674143	20675357	20675940*	20676260*	20676418*	20677262
20677264	20677264	20677265	20677266	20677267	20677268
20677270	20677811*	20677920	20678121	20678122	20678979
20679398	20679400	20679401	20679872*	20679875*	20679926*
20680028*	20680029*	20680030*	20680031*	20680034*	20681054
20681758*	20681929*				

Maintenance Orders/Work Orders

70173467

Other Documents

Combined Hope Creek and Salem Stations Limited Scope Fire Protection Audit Report Audit  
 NOSA-HPC-15-10 (80113607), dated January 26-30, 2015  
 Fire Drill Scenario UADS5012815 Record, drill date 01/28/15  
 FP-AA-015-F3, Hourly Firewatch Inspection Log, 01/11/2015-01/13/2015  
 Daily Firewatch Inspection Log-AA-015-F4, 01/11/2015-01/13/2015  
 FP-AA-015-F6, Firewatch post order log Accountability Form, 01/11/2015-01/13/2015  
 S-C-FBR-FEE-1685, CCZ, Equipment Hatches and Selected fire Doors, Revision 1

**Section 1R11: Licensed Operator Regualification Program**

Procedures

EP-SA-111-121, Fission Product Barrier Table, Revision 0  
 EP-SA-111-222, EAL Technical Basis for Fission Product Barrier Degradation, Revision 0  
 2-EOP-TRIP-1, Reactor Trip or Safety Injections, Revision 28  
 S2.OP-AR.ZZ-0018, Auxiliary Annunciator, Revision 18  
 S2.OP-AB.RC-0001, Reactor Coolant System Leak, Revision 11  
 2-EOP-LOCA-1, Loss of Reactor Coolant, Revision 28  
 2-EOP-LOCA-3, Transfer to Cold Leg Recirculation, Revision 29

Other Documents

Scenario S-ESG-1501, Revision 0

**Section 1R12: Maintenance Effectiveness**Notifications

20679357*	20679378*	20681404*	20681931*	20682331*	20682406*
20682695*	20682899*	20682961*	20682968*	20682974*	

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**Procedures

MA-AA-716-009, Use Of Maintenance Procedures, Revision 5  
 MA-AA-716-003, Tool Pouch / Minor Maintenance, Revision 9  
 WC-AA-105, Work Activity Risk Management, Revision 2  
 S2.OP-IO.ZZ-0004, Power Operation, Revision 72  
 OP-AA-101-112-1001, On-Line Risk Assessment, Revision 9  
 S2.IC-GP.ZZ-0178, Drain Tank and Feedwater Heater Level System Tuning, Revision 0  
 WC-AA-101, On-Line Work Management Process, Revision 23  
 WC-AA-105, Work Activity Risk Management, Revision 3  
 OP-AA-108-116, Protected Equipment Program, Revision 9  
 OP-AA-101-1112-1002, On-Line Risk Assessment, Revision 9  
 ER-AA-600-1042, On-Line Risk Management, Revision 7

Notifications

20673999	20674073	20675477	20675641*	20675644*	20675655*
20675662*	20675665*	20675736*	20675738*	20676078	20676607*
20680286	20680779*	20681268*			

Maintenance Orders/Work Orders

60121194

Drawings

205305, Bleed Steam and Heater Drains, Sheets 1 and 5, Revisions 36 and 50

Other Documents

Key Salem PRA Results, SGS PRA SA112A  
 NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Revision 4A  
 Operations Department Daily Orders for January 14, 2015  
 Temporary Standing Order 2015-01, Revision 0  
 Salem Generating Station, Unit 1 Risk Assessment, Work Week 508, Revision 2  
 Salem Generating Station, Unit 1 Risk Assessment, Work Week 510, Revision 0  
 Salem Generating Station, Unit 2 Risk Assessment, Work Week 508, Revision 2  
 Salem Generating Station, Unit 2 Risk Assessment, Work Week 510, Revision 0  
 Salem Common Standing Order 2014-24, Unit 2 Voltage Regulator, 12/24/14 – 03/01/15

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

S1.OP-AR.ZZ-0014, Auxiliary Annunciator – Alarm List, Revision 27  
 S1.OP-DL.ZZ-0003, Control Room Logs – Modes 1 – 4, Revision 74  
 S1.OP-AR.ZZ-0001, Overhead Annunciator Window A, Revision 51  
 S1.OP-ST.NIS-0001, Power Distribution – Axial Flux Difference, Revision 9  
 AD-AA-101-1006, Procedure Biennial Reviews, Revision 0  
 LS-AA-115-1006, Manual for Processing Vendor Part 21 Documents, Revision 0  
 MA-AA-1000, Conduct of Maintenance Manual, Revision 15  
 MA-AA-716-100, Maintenance Alterations Process, Revision 11  
 OP-AA-108-112, Definition and Measurement of Mispositioned Plant Components, Revision 4  
 OP-AA-106-101-1001, Event Response Guidelines, Revision 14  
 OP-AA-106-103-1101, Mitigating Strategies Equipment Expectations, Revision 0  
 S2.OP-ST.NIS-0002, Power Distribution – Quadrant Power Tilt Ration, Revision 14  
 S2.OP-AR.ZZ-0005, Overhead Annunciators Window E, Revision 19  
 SC.IC-CC.NIS-0005, Miscellaneous Control and Indication Channel Calibration, Revision 6  
 SC.IC-GP.ZZ-0003, General Instrument and Calibration Procedure for Field Devices,  
 Revision 18  
 SC.OP-AB.ZZ-0001, Adverse Environmental Conditions, Revision 17  
 SC.OP-PT.SF-0001, Portable Spent Fuel Pit Pump Operability Test, Revision 10  
 SC.OP-PT.TSC-0003, Baldor Portable Emergency Generator, Revision 2  
 SY-AA-101-108, Response to Suspicious Activity and Events Maliciously Directed at Plant  
 Safety or Security, Revision 12  
 UFSAR Page 9.1-15, dated April 26, 2000, Revision 18  
 14 CFCU Slow Speed Vibration Data following motor replacement, 03/19/2015  
 Schultz Electric Preliminary Inspection Results, CFCU Motor 1S-69 300/100 HP (failed 14  
 CFCU motor), dated 03/18/15  
 Westinghouse Motor Repair/Refurbishment Report for PSEG, 300/100 HP CFCU Motor 3S-69,  
 dated 05/14/10

Notifications

20664997	20664997	20665037	20665039	20665040	20665247
20665522	20665889	20666245	20671667	20672921	20674081
20674146*	20675717*	20675784	20676014	20676475	20676604*
20676726*	20677481	20677481	20677703	20678317	20679273*
20679430*	20681930*				

Maintenance Orders/Work Orders

30176543	30223209	30250302	30258959	30273999	30276097
30276136	60119239	60121687	70170178		

Other Documents

EN 50527, dated 10/12/2014  
 UFSAR 9.2.1.2  
 UFSAR 9.4.3  
 UFSAR Change Notice SCN 02-023  
 SECG, Reportable Action Levels, Section 11.7, Revision 9  
 LS-SA-1000-1001, Salem Unit 1 Surveillance Frequency Control Program List of Surveillance  
 Frequencies, Revision 5

MA-AA-716-100, Form 3, Valve and Switch Log, Revision 11, completed 09/07/2014  
 ANSI/ISA-S67.04-Part 1-1994, Setpoints for Nuclear Safety-Related Instrumentation,  
 dated 08/24/1995  
 Part 9900: Technical Guidance – Standard Technical Specifications Section 3.0 Acceptable  
 Measurement Tolerances for Technical Specification Limits, dated 10/01/78  
 Regulatory Guide 1.105, Setpoints for Safety-Related Instrumentations, Revision 3  
 Regulatory Issue Summary 2006-17, NRC Staff Position on the Requirements of 10 CFR 50.36,  
 “Technical Specifications,” Regarding Limiting Safety System Settings during Periodic  
 Testing and Calibration of Instrument Channels  
 Salem Unit 1 Cycle 24 COLR, dated August 2014  
 Salem 1 Narrative Log, 02/12/2015 Day  
 SC.DE-TS.ZZ-1904(Q), PSEG Nuclear LLC Technical Standard, Instrument Setpoint  
 Calculations for Salem Generating Station Units 1 and 2, Revision 1  
 Salem 1 Narrative Log, 02/16/2015 Night  
 Salem 2 Narrative Log, 10/12/2014  
 S1.OP-SO.SW-0005, Service Water System Operation, Revision 39  
 SC-NIS003-01, Salem 1 and 2 Reactor Flux Power Range, Revision 3  
 S-C-SW-MDC-1350, Service Water System MODE OPS Analysis, Revision 8  
 S-C-SW-MEE-0953-1, Service Water Traveling Screen Classification Evaluation, Revision 1  
 Technical Specification Bases: 3/4.2.2 and 3/4.2.3: Heat Flux and Nuclear Enthalpy Hot  
 Channel and Radial Peaking Factors, Amendment No. 237  
 Westinghouse Plants, Rev. 4 STS (NUREG-1432), Vol. 2, Bases, Section 3.2.4 - QPTR

### **Section 1R18: Plant Modifications**

#### Procedures

S1.OP-DL.ZZ-0003, “Control Room Log – Modes 1-4,” Revision 75, Attachment 1, Page 14 of  
 50, Demineralized Water Storage Tank Levels, February 9-15 and 16-22

#### Notifications

20669542	20677403	20678834	20678928	20679056	20679334
20679662	20680142	20681895			

#### Maintenance Orders/Work Orders

80106028	80109929
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#### Drawings

205236-SIMP, U1 AFW System Simplified P&ID, Revision 1

#### Other Documents

DCP 80106028, Unit 1 and 2 Spare Non-Safety Related Auxiliary Feedwater Pump,  
 Revision 2

DCP 80109929, NSR Auxiliary Feedwater Pump for MSPI Recovery, Revision 1

Salem 1 Narrative Logs, 03/02/2015 Night

Technical Specification 3.7.1.3, Auxiliary Feed Storage Tank, Amendment No. 299

**Section 1R19: Post-Maintenance Testing**

Procedures

- MA-AA-716-012, Post Maintenance Testing, Revision 20
- SC.IC-CC.NIS-0018, N44 Power Range, Revision 8
- SC.MD-CM.CBV-0001, Removal and Installation of CFCU Motor, Bearing Replacement and Motor Power Leads Insulation, Revision 10
- S1.OP-ST.CBV-0003, Containment Systems – Cooling Systems, Revision 17
- S1.OP-ST.SSP-0011, Engineering Safety Feature Response Time Testing, Revision 18
- S2.IC-GP.NIS-0001, Nuclear Instrumentation System Data Procedure, Revision 321
- S2.OP-DL.ZZ-0003, Control Room Log – Modes 1-4, Revision 97
- S2.RA-ST.SW-0010, Inservice Testing Containment Fan Coil Unit (CFCU) Service Water Valves Acceptance Criteria, Revision 49

Notifications

20679662*	20681405*	20682266*	20682263*	20682261*	20682259*
20682242*	20682907*	20682971*	20683137*	20664832	20673025
20673636	20675624	20676595	20676752	20676753	20676754
20676871	20677028	20677892	20678043	20678066	20678135
20681031	20681193	20681301	20681479	20681606	20681675
20681689	20681699	20681751	20681811	20681821	20681823
20681831	20681841	20681855	20681874	20681875	20681880
20681880	20681899	20681902	20681916	20681926	20681964
20681976	20682013	20682191	20682230	20682279	20682280
20682337	20682355	20682356	20682390	20682392	20682394
20682396	20682625	20682696	20683022	20692404	

Maintenance Orders/Work Orders

30160436	50158472	60121389	60121554	60121848	60122192
60122382	60122470	70174554	70174727		

Drawings

- 205238-A-8761, Salem Unit 1 Reactor Containment Ventilation Revision 31

**Section 1R20: Refueling and Other Outage Activities**

Procedures

- S1.OP-IO.ZZ-0003, Hot Standby to Minimum Load, Revision 33
- S1.OP-IO.ZZ-0004, Power Operation, Revision 59
- S1.OP-IO.ZZ-0005, Minimum Load to Hot Standby, Revision 22
- S1.OP-SO.TRB-0002, Turbine-Generator Shutdown Operations, Revision 18

Notifications

20681280*	20681893	20681903	20681960	20682128	20682129
20682131	20682133*	20682214*	20682218	20682259	20682263
20682266*	20682278*	20682285*	20682342*		

Maintenance Orders/Work Orders

60122350	60122406	60122441
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Other Documents

OP-AP-300-1003, Attachment 1 - REMA Form, dated 03/13/15  
Salem 1 Narrative Log, 03/13/2015 Day

**Section 1R22: Surveillance Testing**

Procedures

MA-AA-716-012, Post Maintenance Testing, Revision 20  
SC.IC-CC.NIS-0018, N44 Power Range, Revision 8  
S2.IC-GP.NIS-0001, Nuclear Instrumentation System Data Procedure, Revision 321  
S2.OP-DL.ZZ-0003, Control Room Log – Modes 1-4, Revision 97  
S2.OP-ST.DG-0002, 2B Diesel Generator Surveillance Test, Revision 42, February 3, 2015  
S2.OP-ST.DG-0010, 2B EDG Aux- Starting Air and Turbo Boss Air Check valve, Revision 12  
S2.RA-ST.DG-0002, 2B EDG Surveillance Test Acceptance Criteria, Revision 5  
S2.IC-CC.RCP-0009, #23 Rx Coolant Loop Delta T-Tavg Protection Channel III, Revision 69  
NC.CH-RC.ZZ-2525, Gamma Spectroscopy Analysis Using CAS, Revision 5  
NC.CH-RC.ZZ-2575, Gamma Spectroscopy System Calibrations, Revision 3  
SC.CH-SA.ZZ-0208, Revision 11, Radiochemical Sample Preparation, Revision 11  
S1.OP-ST.RC-0008, Revision 26, Reactor Coolant System Water Inventory Balance  
S2.OP-ST.RC0008, Revision 37, Reactor Coolant System Water Inventory Balance

Notifications

20675340    20676595    20676752    20676753    20676754    20676871  
20677028    20680554    20681243    20681626    20682173\*    20682242\*  
20682637

Maintenance Orders/Work Orders

30160436    50158472    60121554    60122238

Other Documents

Unit 2 Narrative Logs for January 2015  
Salem Unit 1 Technical Specification 3.4.8  
Salem Unit 1 & 2 Technical Specification Amendments 180 and 161, "Removal of RCS Chemistry Technical Specification 3.4.7," dated February 22, 1996  
Unit 1 coolant radiochemical sample analysis results – sample ID 201503301019, March 30  
Unit 1 Reactor Coolant System Leakrate Trending Data Sheet for March 2015  
Unit 2 Reactor Coolant System Leakrate Trending Data Sheet for March 2015

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

Procedures

EP-SA-111-F4, Attachment 4, General Emergency, Revision 2

**Section 1EP6: Drill Evaluation**Procedures

EP-SA-111-121, Fission Product Barrier Table, Revision 0  
 EP-SA-111-222, EAL Technical Basis for Fission Product Barrier Degradation, Revision 0  
 2-EOP-TRIP-1, Reactor Trip or Safety Injections, Revision 28  
 S2.OP-AR.ZZ-0018, Auxiliary Annunciator, Revision 18  
 S2.OP-AB.RC-0001, Reactor Coolant System Leak, Revision 11  
 2-EOP-LOCA-1, Loss of Reactor Coolant, Revision 28  
 2-EOP-LOCA-3, Transfer to Cold Leg Recirculation, Revision 29

Notifications

20678369\*    20681476\*    20681969\*    20682001\*    20682137\*    20682462\*

Other Documents

Scenario S-ESG-1501, Revision 0

**Section 4OA1: Performance Indicator Verification**Notifications

20681932\*    20681971\*    20682142\*    20683026\*    20683981

**Section 4OA2: Problem Identification and Resolution**Notifications

20674309\*    20674518\*    20674596\*    20674697\*    20675090\*    20675381\*  
 20675402\*    20676042\*    20676511\*    20676608\*    20676726\*    20676741\*  
 20677403\*    20677643\*    20677859\*    20678597\*    20679212\*    20681597\*  
 20682004\*    20682903\*

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**Procedures:

ER-AA-310-1003, Attachment 1 – Approach for MR Performance Criteria  
 Selection, Revision 6  
 S2.IC-PT.RCS-0008, Control Rod Drive Mechanism Cable Checks, Revision 6  
 S2.OP-AB.CW-0001, Circulating Water System Malfunction, Revision 34  
 S2.OP-AB.LOAD-0001, Rapid Load Reduction, Revision 17  
 S2.OP-AB.CHEM-0001, Abnormal Secondary Plant Chemistry, Revision 23

Notifications

20638387    20638388    20642907    20646971    20663142\*    20663446  
 20665064    20665168    20671678    20673521    20673521    20677856  
 20677876    20677877    20677906    20678008    20678131    20681226

Maintenance Orders/Work Orders

30207464    30243549    60115353    70163348    70163598    70166024



Drawings

223027-A-8987, Salem Unit 2 Reactor Head Cable Connections, Revision 6  
 227870-A-1403, Salem Unit 2 Rod Control System and Core Exit Thermocouple System  
 Reactor Core Map, Revision 9  
 VTD 326682 – Areva Drawing 02-5046294, CRDM Power Cable Routing Details, Revision 2  
 VTD 326682 – Areva Drawing 02-5046298, CRDM Cable Support Connection to Messenger  
 Wires, Revision 0  
 Analysis and Measurement Corporation Final Report SAL140401R0-F: Control Rod Drive  
 Mechanism Characterization – Unit 2, dated April 2014

Other Documents

Salem Unit 2 Rod Control System (RCS) MR function S-RCS-F08 status

**LIST OF ACRONYMS**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
AFST	auxiliary feedwater storage tank
AFW	Auxiliary Feedwater
CAP	corrective action program
CFCU	containment fan coil unit
D/P	differential pressure
DWST	demineralized water storage tank
EAL	Emergency Action Level
EDG	emergency diesel generator
FHB	Fuel Handling Building
HELB	high energy line break
IAW	in accordance with
IMC	Inspection Manual Chapter
LER	licensed event report
MELB	moderate energy line break
MR	maintenance rule
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
PD	performance deficiency
PRA	probabilistic risk assessment
PSEG	Public Service Enterprise Group Nuclear, LLC
QPTR	quadrant power tilt ratio
SDP	Significance Determination Process
SGFP	steam generator feedpump
SSC	structure, system, and component
SW	service water
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report