



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

November 8, 2016

Mr. Peter P. Sena, III  
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 –  
INTEGRATED INSPECTION REPORT 05000272/2016003 AND  
05000311/2016003 AND INDEPENDENT SPENT FUEL STORAGE  
INSTALLATION REPORT 0720048/2016001

Dear Mr. Sena:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Salem Nuclear Generating Station, Units 1 and 2. On October 13, 2016, the NRC inspectors discussed the results of this inspection with Mr. Patrick Martino, Salem Operations Director, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements. Further, inspectors documented a licensee-identified violation regarding Independent Spent Fuel Storage Installation (ISFSI) operations which was determined to be a Severity Level IV in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the significance of this finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at Salem Nuclear Generating Station.

P. Sena

-2-

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Sincerely,

**/RA/**

Fred L. Bower, III, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

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

Enclosure:  
Inspection Report 05000272/2016003 and  
05000311/2016003  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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**U.S. NUCLEAR REGULATORY COMMISSION**

## REGION I

Docket Nos. 50-272 and 50-311

License Nos. DPR-70 and DPR-75

Report Nos. 05000272/2016003 and 05000311/2016003

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Salem Nuclear Generating Station, Units 1 and 2

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

Dates: July 1, 2016 through September 30, 2016

Inspectors: P. Finney, Senior Resident Inspector  
A. Ziedonis, Resident Inspector  
A. Siwy, Project Engineer  
R. Barkley, Senior Project Engineer  
B. DeBoer, Health Physicist  
M. Draxton, Project Engineer  
J. Nicholson, Senior Health Physicist  
R. Nimitz, Senior Health Physicist  
M. Patel, Operations Engineer

Approved By: Fred L. Bower, III, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Enclosure

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## SUMMARY

Inspection Report (IR) 05000272/2016003, 05000311/2016003; 07/01/2016 – 09/30/2016; Salem Nuclear Generating Station Units 1 and 2; Follow-up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified one self-revealing finding 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 April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### Cornerstone: Initiating Events

- Green. The inspectors documented a self-revealing, Green finding (FIN) because PSEG did not classify plant equipment in accordance with procedure ER-AA-1001, "Component Classification," Revision 0, step 4.5. Specifically, PSEG did not appropriately classify a valve and relay within the stator water cooling (SWC) system, and subsequently did not perform the appropriate periodic maintenance. As a result of the absence of maintenance, the valve developed a packing leak, which dripped onto the trip relay and caused the relay to internally fill with water. On February 14, 2016, the trip relay contacts experienced an electrical short, which led to a turbine trip and a reactor trip from 100 percent power. PSEG entered this issue into the corrective action program (CAP) under notifications 20720566 and 20745264, performed apparent cause evaluation (ACE) 70184453, replaced the failed relay, and repaired the packing leak on the SWC valve.

The inspectors determined that a performance deficiency existed because PSEG did not properly classify the SWC relay and valve in accordance with station procedures to ensure the components would receive the appropriate preventive maintenance (PM). The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely impacted its objective to limit the likelihood of events that upset plant stability (main generator and turbine trip) and challenge critical safety functions. Using IMC 0609, Attachment 4 and Appendix A, Exhibit 1, the inspectors determined that this finding was of very low safety significance, or Green, since mitigating equipment relied up to transition the plant to stable shutdown remained available. The inspectors determined there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. (Section 4OA3)

### Other Findings

A Severity Level (SL) IV violation that was identified by PSEG was reviewed by the inspectors. Corrective Actions (CAs) taken or planned by PSEG were entered into PSEG's CAP. This violation and its corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period shutdown and defueled. A reactor startup was commenced on July 28, but was aborted and the unit was returned to Mode 3 (EN #52129). The reactor startup was recommenced on July 29. On August 1, while at 79 percent power, the 11 steam generator feedwater pump (SGFP) rapidly decelerated. Operators responded by initiating a manual main generator runback and making an unplanned power reduction to 58 percent. Following repairs, power ascension was resumed and 100 percent power was reached on August 4. On August 31, another unplanned power reduction was made to 58 percent in response to elevated vibrations on the 11 SGFP, then lowered to 47 percent the following day. Following repairs to the SGFP, power was raised and 100 percent was reached on September 4. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period in Mode 3 following a reactor trip on June 28. A reactor startup was commenced on July 1. On July 4, Unit 2 made an unplanned power reduction from 82 to 45 percent due to an intermittent ground fault on a main generator isolation phase bus. Power was further reduced to 13 percent later that day in order to take the main generator off-line. On July 11, Unit 2 synchronized to the grid and ascended in power to 47 percent following troubleshooting of the main generator ground issue; however, the main generator tripped shortly thereafter and an unplanned power reduction was made to 13 percent. Unit 2 remained at 13 percent power until July 22, when the main generator was synchronized to the grid and a power ascension was implemented coincident with troubleshooting for intermittent electrical grounds. Full power was reached on July 24, but operators were forced to make another unplanned power reduction to 43 percent power due to alarm indications of a recurring electrical ground. Five minutes later, the main generator tripped and another unplanned reactor power reduction was made to 12 percent. On August 7, following repairs internal to one of the main transformers, the generator was synchronized to the grid and a power ascension was commenced. On August 9, Unit 2 reached 100 percent. On August 31, the reactor tripped following a loss of the 21 reactor coolant pump (RCP) on overcurrent (EN #52213). Following repairs, a reactor startup was commenced on September 5 and 100 percent power was reached on September 10. 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 – 2 samples)

.1 External Flooding

a. Inspection Scope

During the week of September 15, the inspectors performed an inspection of the external flood protection measures for Salem Unit 1 and Unit 2. The inspectors reviewed technical specifications (TSs), procedures, design documents, and Updated Final Safety Analysis Report (UFSAR) which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be

affected by external flooding. The inspectors conducted a general site walkdown of all external areas of the plant, including the auxiliary building, emergency diesel generators (EDGs) and service water intake structure to ensure that PSEG erected flood protection measures in accordance with design specifications. Where applicable, the inspectors determined installed flood seal service life and verified that adequate procedures existed for inspecting the installed seals. The inspectors also reviewed operating procedures for mitigating external flooding in advance of severe weather on September 15, 2016, to confirm that, overall, PSEG had established adequate measures to protect against external flooding events and, more specifically, that credited operator actions were adequate.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PSEG's preparations for the onset of hot weather on July 26. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the EDGs and SW to ensure system availability. 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.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdown (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, 12 spent fuel pool cooling train with 11 spent fuel pool cooling train out of service (OOS) on August 10
- Unit 2, main generator isophase system on July 5
- Common, SW system in the intake structure on July 19

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 UFSAR, TSs, notifications (NOTFs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its 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 September 7, 2016, the inspectors performed a complete system walkdown of accessible portions of the Unit 1 high-head safety injection 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 as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. For identified degradation, the inspectors confirmed the degradation was appropriately managed by the applicable aging management program. Additionally, the inspectors reviewed a sample of related notifications and work orders to ensure PSEG appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 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 OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1, Mechanical penetration area on August 10
- Unit 1, CO<sub>2</sub> discharge in exciter housing on August 16
- Unit 2, Turbine building general area in vicinity of isophase bus ducts on July 8
- Unit 2, Relay and battery room while equipment was set up for monitoring main power transformers on July 26
- Unit 2, Mechanical penetration area on August 11

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11Q – 4 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 29, 2016, which included a regualification examination and a scenario covering the following major events: functional recovery of heat sink, loss of coolant accident with failure of automatic safety injection, and a loss of offsite power following safety injection reset. 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 operator performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met established licensee criteria. The major activities observed included:

- Unit 1, Aborted reactor startup on July 28
- Unit 2, Reactor startup post-trip on July 1
- Unit 2, Reactor startup post-trip on September 5

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 Title 10 of the *Code of Federal Regulations* (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 CAs 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, Auxiliary feedwater check valve back leakage on August 24

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, Mode change while moving irradiated fuel with 12 chilled water pump inoperable on July 14
- Unit 1, Mid-loop operation and vacuum fill of reactor coolant system on July 16
- Unit 1, 11 SGFP emergent work due to pump coupling failure on August 31
- Unit 2, Emergent troubleshooting in response to reactor trip on July 3

- Unit 2, Troubleshooting on the 25 kilovolt (kV) system in response to intermittent grounds on July 16
- Common, Station blackout generator OOS on August 23

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Unit 1, Pressurizer surge line temperature change of more than 100 degrees Fahrenheit in less than 20 minutes on July 26
- Unit 1, Operability of source range nuclear instruments during aborted reactor startup on July 28
- Unit 1, Quadrant power tilt ratio repeated TSs entries on September 1

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 PSEGs evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds (OWAs), the inspectors determined whether the measures in place would function as intended and were properly controlled by PSEG.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Unit 2, Temporary support installed on junction box at electrical penetration 2-10 on September 9

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 4 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 1, High main steamline flow functional following comparator replacement on August 4
- Unit 2, 22 CFCU motor cooler following leak on September 2
- Unit 2, Main steam line radiation monitors following corrective maintenance on September 9
- Unit 2, Containment personnel airlock leak rate retest following failed leak rate surveillance and corrective maintenance on September 16

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

.1 Unit 1 Maintenance and Refueling Outage (1R24)

a. Inspection Scope

The Unit 1 maintenance and refueling outage (1R24), which commenced on April 14, 2016, was ongoing at the start of this inspection period. The inspectors reviewed PSEG's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes 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 TSs when taking equipment OOS
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Tracking of startup prerequisites, walkdown of 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 refueling outage activities

b. Findings

No findings were identified.

.2 Unit 2 Forced Outages

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk for the Unit 2 forced outages between July 4 – August 7 due to intermittent electrical grounds on the 25 kV system, and from August 31 through September 5, development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, 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 to ensure that TSs were met
- Monitoring of decay heat removal operations or operations at low power
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity

- Tracking of startup prerequisites, walkdown of the 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 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components 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, Integrated leak rate test (ILRT) during 1R24 refueling outage on July 19 (containment isolation valve test)
- Unit 1, Source and intermediate range nuclear instrument testing during reactor startup on July 28
- Unit 1, Departure from nucleate boiling surveillance requirement SR 4.2.5.2. on August 9
- Unit 1, 13 loop overtemperature Delta-Temperature channel calibration while overtemperature Delta-temperature unsatisfactory on August 12
- Unit 1, 1A EDG monthly surveillance run on August 22

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

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 August 9, 2016, 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 CAP.

b. Findings

No findings were identified.

## 2. **RADIATION SAFETY**

### **Cornerstones: Occupational and Public Radiation Safety**

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

The inspectors reviewed PSEG's performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR Part 20, TSs, Regulatory Guide 8.38, and the procedures required by TSs as criteria for determining compliance.

#### Contamination and Radioactive Material Control (1 sample)

The inspectors observed the monitoring of potentially contaminated material leaving the radiological controlled area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

b. Findings

No findings were identified.

#### 2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

The inspectors assessed PSEG's performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements contained in 10 CFR Part 20, applicable RGs, TSs, and procedures required by TSs as criteria for determining compliance.

#### Inspection Planning

The inspectors conducted a review of Salem Station collective dose history and trends; ongoing and planned radiological work activities; previous post-outage ALARA reviews; radiological source term history and trends; and ALARA dose estimating and tracking procedures.



### Radiological Work Planning

The inspectors selected the following radiological work activities based on exposure significance for review:

- RWP 12, Scaffolding
- RWP 14, Pressurizer
- RWP 15, Baffle Bolt Support
- RWP 16, Baffle Bolts

For each of these activities, the inspectors compared the results achieved (dose rate reductions, person-rem used) with the intended dose established in the ALARA planning for these work activities.

#### b. Findings

No findings were identified.

### 2RS4 Occupational Dose Assessment (71124.04 - 3 samples)

#### a. Inspection Scope

The inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR Part 20, Regulatory Guides 8.9 and 8.34, TSs, and procedures required by TSs as criteria for determining compliance.

### Inspection Planning

The inspectors reviewed radiation protection program audits, National Voluntary Laboratory Accreditation Program (NVLAP) dosimetry testing reports and procedures associated with dosimetry operations.

### External Dosimetry (1 sample)

The inspectors reviewed dosimetry NVLAP accreditation, onsite storage of dosimeters, the use of “correction factors” to align electronic personal dosimeter results with NVLAP dosimetry results, dosimetry occurrence reports, and CAP documents for adverse trends related to external dosimetry.

### Special Dosimetry Situations (1 sample)

The inspectors reviewed PSEG’s worker notification of the risks of radiation exposure to the embryo/fetus, the dosimetry monitoring program for declared pregnant workers, external dose monitoring of workers in large dose rate gradient environments, and dose assessments performed since the last inspection that used multi-badging, skin dose or neutron dose assessments.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with occupational dose assessment were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

**Cornerstone: Public Radiation Safety (PS)**

2RS7 Radiological Environmental Monitoring Program (71124.07 - 1 sample)

a. Inspection Scope

The inspectors reviewed the Radiological Environmental Monitoring Program (REMP) to validate the effectiveness of the radioactive gaseous and liquid effluent release program and implementation of the Groundwater Protection Initiative (GPI). The inspectors used the requirements in 10 CFR Part 20, 40 CFR Part 190, 10 CFR Part 50 Appendix I, and the site's TSs, Offsite Dose Calculation Manual (ODCM), Nuclear Energy Institute (NEI) 07-07, and procedures required by TSs as criteria for determining compliance.

Groundwater Protection Initiative Implementation (1 sample)

The inspectors reviewed: groundwater monitoring results; changes to the GPI program since the last inspection; anomalous results or missed groundwater samples; leakage or spill events including entries made into the decommissioning files (10 CFR 50.75(g)); evaluations of surface water discharges; and PSEG's evaluation of any positive groundwater sample results including appropriate stakeholder notifications and effluent reporting requirements.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index (4 samples)

a. Inspection Scope

The inspectors reviewed PSEG's submittal of the Mitigating Systems Performance Index (MSPI) for the following systems for the period of July 1, 2015, through June 30, 2016.

- Units 1 and 2, Heat removal system (MS08)
- Units 1 and 2, Residual heat removal system (MS09)

To determine the accuracy of the performance indicator (PI) data reported during those periods, inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed PSEG's operator narrative logs, notifications, MSPI derivation reports, event reports, and NRC integrated IRs to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed licensee submittals for the occupational radiological occurrences PI for the first quarter 2015 through the second quarter 2016. The inspectors used PI definitions and guidance contained in NEI 99-02, Revision 7, to determine the accuracy of the PI data reported. The inspectors reviewed electronic personal dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized PI occurrences. The inspectors conducted walkdowns of various locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

b. Findings

No findings were identified.

.3 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual  
Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors reviewed licensee submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the first quarter 2015 through the second quarter 2016. The inspectors used PI definitions and guidance contained in the NEI 99-02, Revision 7, to determine if the PI data was reported properly. The inspectors reviewed the public dose assessments for the PI for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the CAP database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if indicator results were accurately reported.

b. Findings

No findings were identified.

#### 4OA2 Problem Identification and Resolution (71152 – 1 sample)

##### .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 PSEG entered issues into their CAP at an appropriate threshold, gave adequate attention to timely corrective actions (CAs), 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 their CAP and periodically attended condition report (NOTF) screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, PSEG performed an evaluation in accordance with 10 CFR Part 21.

###### b. Findings

No findings were identified.

##### .2 Annual Sample: 1B and 2B EDG Supply Breaker Failed to Close

###### a. Inspection Scope

On September 1, 2015, the 1B EDG supply breaker failed to close during monthly surveillance testing. On February 1, 2016, the 2B EDG supply breaker failed to close during monthly surveillance testing. PSEG performed causal analyses of these events and determined the cause was an intermittent malfunction of an interlock switch. The inspectors performed an in-depth review of PSEG’s apparent cause analysis, troubleshooting plans, extent-of-condition reviews, and short and long term CAs, associated with the 1B and 2B EDG supply breaker failure to close events that occurred on September 1, 2015 (NOTF 20701570) and February 1, 2016 (NOTF 20718149), respectively. This review focused on PSEG’s problem identification, evaluation, and resolution associated with the two EDG supply breaker failure events.

###### b. Findings and Observations

No findings were identified.

Overall, the inspectors determined that PSEG appropriately identified, characterized, and implemented CAs associated with the two EDG supply breaker failures. PSEG identified that the cause of the failure of the two 4kV Magne-blast breakers to close on demand was an intermittent malfunction of the 52IS Interlock Switch. Destructive testing revealed that combination of conditions, such as, friction, vibration, and the manufacture burring process contributed to the failures of the contact terminals within the switch. GE Hitachi Nuclear Energy was notified of the failures and determined that a reportable condition existed and issued a 10 CFR Part 21 notification. PSEG’s planned CAs are to replace the 32 affected breaker’s switches during the planned preventative maintenance work windows. The inspectors noted that PSEG’s planned replacement schedule did not incorporate risk significance to appropriately prioritize the breaker replacement plan.

The inspectors also noted that PSEG missed an opportunity to perform Part 21 report recommendations associated with verifying and testing the functionality of the 51-IS switches in some of the affected population of the 4kV breakers on Unit 1. PSEG generated NOTF 20745076 in response to the inspectors' observation for resolution and to reevaluate the replacement schedule of the affected breakers.

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 7 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 as 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 and 50.73. The inspectors reviewed PSEGs follow-up actions related to the events to assure that PSEG implemented appropriate CAs commensurate with their safety significance.

- Unit 1, Retracted event on July 28 (EN #52129)
- Unit 1, 11 SGFP elevated vibrations and subsequent downpower to 58 percent on August 31
- Unit 2, Main generator trip on July 11
- Unit 2, Main generator trip on July 24
- Unit 2, Reactor trip following a service water (SW) leak and the 21 RCP trip on overcurrent on August 31 (EN #52213)

###### b. Findings

No findings were identified.

##### .2 (Closed) Licensee Event Report 05000311/2016-003-00: Automatic Trip due to Main Generator Protection Trip

###### a. Inspection Scope

On February 14, 2016, Salem Unit 2 automatically tripped from approximately 100 percent power. The reactor trip was due to a main turbine trip caused by a main generator protection signal, which was initiated by a main generator stator water cooling leak unto a protective relay, thereby causing a short circuit in the protective relay trip contacts. All emergency core cooling systems and emergency safeguards feature systems functioned as expected. PSEG submitted this licensee event report (LER) in accordance with 10 CFR 50.73 (a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)." Specifically for this event, automatic actuation of the Reactor Protection System and the

Auxiliary Feedwater System required a LER submittal. The inspectors reviewed the LER, the associated cause evaluation, and interviewed PSEG staff. This LER is closed.

b. Findings

Introduction. The inspectors documented a self-revealing, Green finding because PSEG did not classify plant equipment in accordance with procedure ER-AA-1001, "Component Classification," Revision 0, step 4.5. Specifically, PSEG did not appropriately classify a valve and relay within the SWC system, and subsequently did not perform the appropriate periodic maintenance. As a result of the absence of maintenance, the valve developed a packing leak, which dripped onto the trip relay and caused the relay to internally fill with water. On February 14, 2016, the trip relay contacts experienced an electrical short, which led to a turbine trip and reactor trip from 100 percent power.

Description. On February 14, PSEG operators in the Unit 2 control room received main generator protection alarm F-47 on the overhead annunciator (OHA) coincident with a reactor trip from 100 percent power. The reactor trip was due to a main turbine trip caused by a main generator protection signal, which was initiated by SWC low flow trip relay S2GEN-2MSE2-GEN-62-C1 (62-C1). The 62-C1 relay actuation was due to a short circuit in the electrical contacts caused by a packing leak from SWC instrument equalizing valve S2GEN-2GW75 (2GW75).

The OHA alarm F-47 is generated from closure of the 7-7C contacts on either the 86R or 86B relays, which are located in electrical cabinet S2TRB-968-2 for the SWC system. During inspection inside this cabinet following the reactor trip, PSEG observed water leaking from flow indication equalizing valve 2GW75 onto the low coolant flow time-delay trip relay (62-C1). Valve 2GW75 is a normally-closed flow-switch-equalizing manual valve of less than one inch in diameter. The as-found condition of the 62-C1 relay was in the tripped position, filled with water, with an electrical short between terminals 1 and 5. After relay 62-C1 was removed from the panel, the relay was turned over and approximately 2 ounces of water flowed out of the relay. After discharging the water from the relay, the electrical continuity between terminals 1 and 5 was re-checked and it still exhibited an electrical short.

At the time of the reactor trip, relay 62-C1 did not have a functional location identifier and was not classified in accordance with ER-AA-1001. This procedure provides the criteria and methodology used in determining the classification of components in support of equipment reliability and PM program procedures. PSEG performed ACE 70184453 in response to the February 14 reactor trip, and determined that the relay should have been classified as high-critical, low duty, mild service, and a single point vulnerability (SPV). The inspectors reviewed ER-AA-1001 and noted that SPVs were defined as components whose failure directly results in a reactor or turbine trip, and required consideration of a mitigation strategy; and critical and non-critical component classifications required PM plans. The ACE also stated that valve 2GW75 (located inside the SWC cabinet, approximately 2 feet above the 62-C1 relay) was classified as run-to-failure. Additionally, the ACE stated "the valve should be considered an SPV because leaking of the valve directly caused the 62-C1 relay contacts to short, causing the trip." ACE corrective actions 7018453-120 and 70184453-130 were created to perform the appropriate classification for relay 62-C1 in accordance with ER-AA-1001, and implement an equipment reliability SPV mitigation strategy for the 62-C1 relay,

respectively. However, the inspectors noted that no actions were assigned to review the classification of valve 2GW75.

The inspectors reviewed the classification basis for valve 2GW75, which was documented in accordance with ER-AA-1001, to determine if the component should be classified as an SPV as discussed in the ACE. The inspectors reviewed the classification screening questions for determination of a critical component and SPV, as well as industry equipment classification guidance documents, and determined that the 2GW75 valve was not necessarily required to be screened as an SPV. Specifically, the valve leak did not “directly” result in a main generator trip, but rather resulted in a “cascading” failure of the 62-C1 trip relay. However, the inspectors determined that the 2GW75 valve met the criteria for a non-critical classification, based on the following screening question: “Does the component’s failure promote the failure of other Critical components?” PSEG originally answered “no” to this screening question for 2GW75, and did not have any actions in the ACE to re-review the screening, despite the action to reclassify the 62-C1 as a critical component. The inspectors reviewed ER-AA-1001, Attachment 4, “Component Classification Guidance,” to determine what would reasonably constitute a failure mode of a manual valve less than 2,” and noted that packing leaks were among the listed failure modes. The inspectors determined that since the 2GW75 packing leak resulted in the failure of the 62-C1, a critical component, the 2GW75 was required to be classified as a non-critical component.

The inspectors reviewed procedure MA-AA-716-210-1001, “Performance Centered Maintenance (PCM) Templates,” Revision 10, which provided guidance on developing PM strategies. The template for manual valves that are classified as non-critical, low duty, and mild service condition, have frequencies of once every 12 years, which equates to 15 years with the 25 percent grace period. The PM template for manual valves included a packing adjustment and inspection for evidence of leakage. However, this valve did not have any documented maintenance performed on it since it was installed in the late 1990s. The inspectors determined that if the 2GW75 valve was appropriately classified, the equipment reliability program would have required maintenance on this valve at least once following installation late in the 1990s and prior to February 14, 2016.

Analysis. The inspectors determined that a performance deficiency existed because PSEG did not properly classify relay 62-C1 and valve 2GW75 in accordance with station procedures to ensure the components would receive the appropriate PMs. The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely impacted its objective to limit the likelihood of events that upset plant stability (main generator and turbine trip) and challenge critical safety functions. Specifically, as a result of classifying the 2GW75 valve as run-to-failure and not performing PMs, the packing failed and leaked onto relay 62-C1, shorted out the contacts, and resulted in a turbine trip and reactor trip from 100 percent power. Using IMC 0609, Attachment 4 and Appendix A, Exhibit 1, the inspectors determined that this finding was of very low safety significance, or Green, since mitigating equipment relied upon to transition the plant to stable shutdown remained available.

The inspectors determined there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. Specifically, the relay 62-C1 and valve 2GW75 classifications were approved in 2010. 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.

Enforcement. This finding does not involve an enforcement action since no violation of NRC requirements was identified. Specifically, ER-AA-1001, "Component Classification," Revision 0, step 4.5, requires the system manager to perform component classification. Contrary to this, PSEG did not appropriately classify SWC valve 2GW75 and relay 62-C1, on November 30, 2010. PSEG entered this issue into the CAP under notification 20720566, performed ACE 70184453, replaced the failed 62-C1 relay, repaired the packing leak on the 2GW75 valve, performed extent-of-condition walkdowns, and corrected the classification of the 62-C1 relay. In addition, PSEG entered the issue regarding improper classification of the 2GW75 relay into the CAP under notification 20745264. Because this finding does not involve a violation of regulatory requirements and is of very low safety significance (Green), it is identified as a finding. **(FIN 05000311/2016003-01, Misclassification of and Lack of Preventative Maintenance for SWC Valve 2GW75 and Relay S62-C1)**

.3 (Closed) LER 05000272/2015-001-02: Fuel Movement in Progress with Fuel Handling Building Ventilation Inoperable

a. Inspection Scope

On January 16, 2015, irradiated fuel was being moved in the Salem Unit 1 Fuel Handling Building (FHB). Technical Specification 3.9.12 requires that FHB ventilation be capable of maintaining slightly negative pressure in the FHB during irradiated fuel movement. Since the FHB differential pressure alarm was locked in, it was being monitored in the control room via a remote camera. While fuel was being moved, the differential pressure oscillated between negative and slightly positive. Fuel movement was not secured as required by TS 3.9.12 when negative differential pressure was not maintained. PSEG's causal evaluation determined that FHB equipment issues led to the FHB differential pressure alarm being locked in. A separate PSEG causal evaluation determined that control room operators did not apply fundamentals of control board awareness and effective crew teamwork. The event was reported under 10 CFR 50.73(a)(2)(i)(B) as an operation or condition that was prohibited by the plant's TSs. The inspectors reviewed this LER, the associated causal analyses and CAs, interviewed PSEG staff, and walked down associated components. This LER is closed.

b. Findings

Inspectors documented an NRC-identified, Green NCV of TS 3.9.12 in Section 1R15 of IR 05000272;311/2015-001. No new findings were identified.

4OA6 Meetings, Including Exit

On October 13, 2016, the inspectors presented the inspection results to Mr. Patrick Martino, Salem Operations Director, and other members of the PSEG staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report. PSEG management acknowledged and did not dispute the findings.



**4OA7 Licensee-Identified Violations**

The following violation of very low significance, Severity Level IV, was identified by PSEG and is a violation of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation (NCV). This issue was reviewed by Region I specialist inspectors knowledgeable of Independent Spent Fuel Storage Installations (ISFSI) during an onsite inspection on July 26, and in-office inspection between July 27 and August 31, 2016.

10 CFR 72.150 requires that each licensee shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall require that these instructions, procedures, and drawings be followed. Holtec HI-STORM Certificate of Compliance 72-1014 Amendment 5, Final Safety Analysis Report for the HI-STORM 100 Cask System, Revision 7, Section 2.1.9.1.2, specifies the required helium backfill pressure range for loaded canisters. Contrary to the above, PSEG selected the incorrect helium backfill pressure range table in Attachment 9 of SC.MD-FR.DCS-0006(Q), Sealing, Drying, and Backfilling of a loaded multi-purpose canister (MPC) for two MPCs, one on June 20, 2016, and the other on June 25, 2016. The NRC inspectors evaluated this violation as having very low safety significance because a thermal analysis performed by Holtec determined the resulting fuel cladding temperatures and the cask/MPC component temperatures would not exceed the applicable design limits for normal long-term storage with the current helium pressure.

In accordance with the NRC Enforcement Policy Section 2.2, Part 72, Independent Spent Fuel Storage Installation inspection findings follow the traditional enforcement process and are not dispositioned through the reactor oversight process or the significance determination process. The violation was determined to be a Severity Level IV violation of the NRC requirements. The licensee entered the issue into their CAP as NOTF 20735208. This Severity Level IV violation was treated as a NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. CAs for this issue included the Holtec thermal analysis and a revision of the MPC loading procedure SC.MD-FR.DCS-0006, Sealing, Drying, and Backfilling of a Loaded MPC.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

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

E. Carr, Site Vice President  
 K. Grover, Plant Manager, Salem  
 M. Adair, Salem Fire Protection Program Engineer  
 S. Blunt, ILRT technician  
 J. Cornell, ILRT technician  
 T. Di Nunzio, Salem Fire Protection System Engineer  
 K. Kenaide, Engineering Director  
 J. Kraus, Electrical and I&C Supervisor  
 D. Krusen, Outage Superintendent  
 B. Leyden, Nuclear Maintenance Technician  
 P. Martino, Operations Director  
 R. Mitchell, Work Week Manager  
 R. Moore, Electrical Engineer  
 T. Mulholland, Operations  
 J. Owad, Salem Design Manager  
 G. Pahwa, Senior Engineer  
 M. Pennington, System Engineer  
 K. Powell, Fire Protection Supervisor  
 M. Richards, Engineer Manager  
 J. Skull, Electrical Maintenance Manager  
 J. Stairs, Engineering Manager  
 J. Stead, Electrical Engineer  
 T. Turek, Maintenance Outage Manager  
 G. Van Wert, Owner, ILRT Inc.  
 J. Vaspoli, Salem Mechanical Maintenance Supervisor  
 C. Williams, Engineering Manager  
 P. Williams, Simulator Training Instructor

Others

J. Vougliotois, Nuclear Engineer, NJ Department of Environmental Protection,  
 Bureau of Nuclear Engineering

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

05000311/2016-003-01	FIN	Misclassification of and Lack of Preventative Maintenance for SWC Valve 2GW75 and Relay S62-C1 (Section 4OA3.2)
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Closed

05000311/2016-003-00	LER	Automatic Trip due to Main Generator Protection Trip (Section 4OA3.2)
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05000272/2015-001-02

LER

Fuel Movement in Progress with Fuel  
Handling Building Ventilation Inoperable  
(Section 4OA3.3)

### LIST OF DOCUMENTS REVIEWED

\* Indicates NRC-identified

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

##### Procedures

EN-AA-170-500, Meteorological Monitoring System Calibration and Maintenance, Revision 1  
SC.OP-AB.ZZ-0001, Adverse Environmental Conditions, Revision 18

##### Notifications

20737192\*    20741523    20741617\*    20742622\*    20743831\*    20745234\*

##### Drawings

219151, No.1 & 2 Units Reactor Containment & Penetration Area Waterstop Joints, Revision 0

##### Maintenance Orders/Work Orders

30291077    30295277    60130315

#### **Section 1R04: Equipment Alignment**

##### Procedures

SC.MD-CM.CVC-0001, Numbers 13 and 23 Charging Pump Repacking Plunger and Valve  
Repair or Replacement, Revision 18

##### Notifications

20479109    20559746    20566572    20571554    20727738    20734301  
20735482    20737477

##### Other Documents

UFSAR 9.3.4

#### **Section 1R05: Fire Protection**

##### Procedures

FP-AA-002-F5, Transient Combustible in Safety Related Areas Impairment Log, Revision 0  
FP-AA-011, Control of Transient Combustible Material, Revision 4  
FP-AA-011-F1, Transient Combustible Permit, Revision 1  
FP-SA-003, Actions for Inoperable Fire Protection - Salem Station, Revision 5  
FP-SA-1181, Salem Pre-Fire Plan Turbine Generator Area, Revision 0  
FP-SA-2551, Salem Pre-Fire Plan Relay & Battery Rooms & Corridors, Revision 0  
FP-SA-2551-F1, Relay and Battery Room, Revision 0  
OP-AA-108-116-F4, Hot Work/Transient Combustible Storage Approval Form, Revision 0

##### Notifications

20736910\*    20737923\*    20738006    20738101    20738105    20738141  
20738426

**Section 1R11: Licensed Operator Requalification Program**Procedures

2-EOP-FRCE-1, Response to Excessive Containment Pressure, Revision 30

2-EOP-LOCA-1, Loss of Reactor Coolant, Revision 30

2-EOP-TRIP-2, Reactor Trip Response, Revision 30

2-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 31

Other Documents

2016 Annual ESG-1604 and ESG-1606

**Section 1R12: Maintenance Effectiveness**Procedures

ER-AA-310-1003, Maintenance Rule – Performance Criteria Selection, Revision 7

ER-AA-310-1004, Maintenance Rule – Performance Monitoring, Revision 14

Notifications

20723577	20736494	20736553	20737787	20738394	20738429
20738792*					

Maintenance Orders/Work Orders

60104107

60113792

Evaluations

70188161

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

OP-AA-101-112-1002, On-Line Risk Assessment, Revision 9

OP-AA-108-116, Protected Equipment Program, Revision 12

OP-SA-103-102-1002-F11, SGFP Trip Will Form, Revision 0

OP-SA-108-115-1001, Operability Assessment and Equipment Control Program, Revision 9

SC.MD-CM-CN-0001, Steam Generator Feed Pump Disassembly, Inspection, Repair and Reassembly, Revision 20

S1.OP-SO.CN-0007, Prompt Recovery from SGFP Trip, Revision 3

S1.OP-SO.RC-0002(Q), Vacuum Refill of the RCS, Revision 24

S1.OP-SO.RC-0006(Q), Draining the Reactor Coolant System Less Than 101 FT EL with Fuel in the Vessel, Revision 32

Notifications

20621265	20658474	20727213	20727252	20735005	20735139
20735150	20735220	20735329	20735413	20735428	20735428
20735640	20735847	20736802	20737231*	20738055	20738235
20738266*	20739299	20739303	20739327*	20740656	

Maintenance Orders/Work Orders

30258254	30280859	30300316	60131159	70168970	70171710
70188429	70188502				

Other Documents

Shutdown Safety Evaluation, Risk assessment to enter Mode 6 and move irradiated fuel assemblies with 12 chilled water pump inoperable, 7/8/2016, Revision 0

Shutdown Safety Evaluation, 1R24 risk assessment based on schedule with data date of 3/18/16, 3/25/2016, Revision 0

ORAM-SENTINEL - All Modes Maintenance and Safety Function Advisor SFAT Logic Database Report, 1/20/16

Miscellaneous

FMCT for Unit 2 Generator Trips, Revisions 1 & 2

Adverse Condition Monitoring (ACM) Plan 16-012, Revisions 1, 2, & 3

Operational Technical Decision Making (OTDM) 16-008 & 16-009

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

ER-SA-470-1001, Salem Fatigue and Transient Monitoring Guidelines, Revision 0

S1.OP-IO.ZZ-0002(Q), Cold Shutdown to Hot Standby, Revision 43

S1.OP-ST.SJ-0020(Q), Periodic Leakage Test RCS Pressure Isolation Valves, Revision 21

SH.MD-GP.ZZ-0240(Q), System Pressure Test at Normal Operating Pressure and Temperature, Revision 10

Notifications

20734394*	20736566	20736630*	20736705	20736726	20740228
20740638	20742427*				

Maintenance Orders/Work Orders

70187934

Other Documents

VTD 326554, WCAP 16194 Evaluation of Pressurizer Insurge/Outsurge Transients for Salem Units 1 and 2, Revision 2

VTD 901765 Sheet 1, WCAP 16994-P Environmental Fatigue Evaluation for Salem Unit 1, Revision 1

**Section 1R18: Plant Modifications**Procedures

MA-AA-796-024, Scaffold Installation, Inspection and Removal, Revision 16

Notifications

20740034

20740716

Maintenance Orders/Work Orders

60130944

60131014

Licensing and Design Basis Documents

Salem UFSAR Section 6.2.5.1.3, Corrosion of Plant Materials, Revision 6  
Salem UFSAR Table 15.4-21, Structural Heat Sinks, Revision 23

Calculations, Analysis, Engineering Evaluations, and Specifications

S2016-220, TCCP 2ST2016-011/80118385R0, "Temporary Support of Termination Box for Penetration 2-10 under TCCP 2ST16-011" 50.59 Screening, Revision 0  
TCCP 2ST2016-011/80118385R0, "Temporary Support of Termination Box for Penetration 2-10 under TCCP 2ST16-011" 50.59 Applicability Review, Revision 0

Modifications

80118385, TCCP 2ST16-011 for S2CAN-2-10 Junction Support, Revision 0

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

Procedures

MA-AA-716-008, Station Coatings Program, Revision 0  
MA-AA-716-012, Post-Maintenance Testing, Revision 20  
SC.IC-TI.ZZ-0102, Westinghouse – Hagan 7100 Control System Configuration Control for Comparators, Revision 18  
S1.IC-FT.RCP-0098, Steam Generator Steam Flow and Turbine Steam Line Inlet Pressure Protection Channel I, Revision 55  
S1.IC-CC.RCP-0038, 1FT-522 #12 Steam Generator Steam Flow Protection Channel I, Revision 60  
S1.OP-AB.CN-0001(Q), Main Feedwater/Condensate System Abnormality, Revision 21  
S1.OP-AB.LOAD-0001(Q), Rapid Load Reduction, Revision 15

Notifications

20736802	20736803	20737261	20737324	20737787*	20738223*
20739346	20740744*				

Drawings

221065, Reactor Protection System Turbine Trip, Runbacks, & Gen. Protection, Revision 15  
220438, Main Steam System Steam Dump to Condenser, Revision 9

Maintenance Orders/Work Orders

30296439  
60121571

Other Documents

DCP 80102435, Revise Turbine Run-Back Setpoints, Revision 0

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

Procedures

SC.RE-RA.ZZ-0002(Q), Inverse Count Rate Ratio during Reactor Startup, Revision 11

Notifications

20735978\*

Other Documents

NF-AA-310 Attachment 3, PWR Move Sheet, Revision 0

NFS15-110, Salem Unit 1, Cycle 25 Region and Fuel Assembly Locations, Revision 0

Miscellaneous

Core reload videos, July 11-13

**Section 1R22: Surveillance Testing**Procedures

S1.RA-IS.ZZ-0013, "Reactor Containment Building Integrated Leak Rate Test," Revision 2

S1.IC-CC.RCP-0009, 1TE-431A-B #13 Rx Coolant Loop Delta T-Tavg Protection Channel III, Revision 65

S1.IC-CC.RCP-0019, 1PT-457 Pressurizer Pressure Protection Channel III, Revision 28

SC.IC-FT.NIS-0013, N35 Intermediate Range, Revision 6

SC.IC-TI.ZZ-0141, Configuration Control for NUS Model GEN802 Function Generators, Revision 2

S1.OP-ST.DG-0001, 1A Diesel Generator Surveillance Test, Revision 47

Notifications

20726309	20726396	20735180	20735967	20736054	20736726
20737747	20738126	20738385*	20738386*	20738388*	20738681*
20738682*	20738683*	20738684*			

Maintenance Orders/Work Orders

30296424	50071414	50171949	70186011	70188281
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Miscellaneous

ILRT Inc. Record of Hold Test Results, July 20-21, 2016

ILRT Inc. Record of Verification Test Results, July 21, 2016

**Section 1EP6: Drill Evaluation**Procedures

2-EOP-FRHS-1, Loss of Secondary Heat Sink, Revision 30

2-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 31

2-EOP-TRIP-2, Reactor Trip Response, Revision 30

S2.OP-AR-ZZ-0002(Q), Overhead Annunciators Window B, Revision 36

S2.OP-AR.ZZ-0007(Q), Overhead Annunciators Window G, Revision 57

S2.OP-AR.ZZ-0018(Q), Auxiliary Annunciator, Revision 20

**Section 2RS1: Access Control to Radiologically Significant Areas**Procedures

RP-AA-800, Control, Inventory, and Leak Testing of Radioactive Sources, Revision 11

LSA-SA-1000-1001, Salem Generating Station Unit 1 Surveillance Frequency Control Program List of Surveillance Frequencies, Revision 7

NC.RS-TI.ZZ-0582(Q), Operating Instruction for the Shepard Model 89 Calibrator, Revision 3

NC.RS-TI.ZZ-0561(Q), Calibration of the Canberra GEM 5 Gamma Monitor, Revision 0

NC.RS-TI-ZZ-0512(Q), Calibration of the Canberra CRONOS Small Article Monitor, Revision 0

NC.RS-TI.ZZ-0549(Q), Calibration of the Canberra ARGOS-5AB Whole Body Contamination Monitor, Revision 0

Documents

Source tracking data

Source leak check test data

Corrective Action Documents (various)

**Section 2RS2: Occupational ALARA Planning and Controls**

Procedures

RP-AA-401, Operational ALARA Planning and Control, Revision 13

Documents

ALARA Plans (various)

Post-outage Radiation Dose Reports

ALARA Work In-process Reviews

Corrective Action Documents (various Notifications)

**Section 2RS4: Occupational Dose Assessment**

Procedures

RP-AA-350, Response to Potentially Contaminated Personnel, Revision 12

RP-AA-220, Bioassay Program, Revision 9

RP-AA-222, Method for Estimating Internal Exposure from In Vivo or In Vitro Bioassay Data, Revision 6

RP-AA-211, Personnel Dosimetry Verification, Revision 7

RP-AA-221, Radiation Protection Whole-body Counter (WBC) and WBC Data Review, Revision 4

RP-AA-270, Prenatal Radiation Exposure, Revision 6

RP-AA-206, Dose Assessment for Airborne Radioactive Material Exposure, Revision 0

RP-AA-301, Radiological Air Sampling Program, Revision 6

RP-AA-203-1001, Personnel Exposure Investigation, Revision 7

RP-AA-303, Personnel Air Sampling, Revision 1

RP-AA-302, Alpha Source Term Characterization, Revision 4

RP-AA-350-1002, Managing Large Scale Contamination Events, Revision 0

RP-AA-281, Comparison of Personal Dosimetry Results, Revision 2

RP-AA-250, External Dose Assessment for Contamination, Revision 8

RP-AA-605, 10 CFR 61 Program, Revision 1

RP-AA-605-1001, Evaluation of 10 CFR 61 Sample Results, Revision 1

RP-AA-203-1001, Personnel Exposure Investigation, Revision 7

NC.RS-TI.ZZ-0514(Q), Calibration and Operation of the IDC-HF Electronic Dosimeter Calibrator and Calibration of the MGPI DMC 2000 Electronic Dosimeters, Revision 0

NC.RS-TI.ZZ-0592(Q), Radiation Protection Instrument (RPI) Laboratory Calibration and Quality Control, Revision 2

RP-AA-270, Prenatal Radiation Exposure, Revision 6



Documents

NVLAP Certification

PSEG Radiation Worker Training

Audit NOSA-SLM-15-08, Exposure Control/ALARA

Collective Dose Report

Electronic Dosimeter Calibration Records (EPDs 053031, 055302, 057589, 063898, 054370)

Salem and Hope Creek Neutron Study 2015

Outage Task Breakdown and Dose Estimates

Occupational Dose Reports

Corrective Action Documents (various)

**Section 2RS7: Radiological Environmental Monitoring Program (REMP)**Procedures

EN-AA-170-4000, Radiological Ground Water Protection Program Implementation, Revision 0

EN-AA-170-4160, Station RGPP Controlled Sample Points, Revision 0

Miscellaneous Documents

Salem Offsite Dose Calculation Manuals (ODCM)

Salem 2015 Annual Effluent Release Report

Salem 2015 Annual Radiological Environmental Monitoring Report

Ground Water Monitoring Data and RGPP Data

Salem Remedial Action Plan Progress Reports

Corrective Action Documents (various Notifications)

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

LS-AA-2001, Collecting and Reporting of NRC Performance Indicator Data, Revision 11

LS-AA-2140, Monthly Data Elements for NRC Occupational Exposure Control Effectiveness,  
Revision 5DocumentsMSPI Derivation Reports for Residual Heat Removal and Heat Removal, Unavailability and  
Unreliability Indices for Units 1 and 2 June 2015 and June 2016Notifications

20743288\*

20744269\*

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

ER-AA-2001-1001, Evaluation of Equipment Reliability Strategies, Revision 1

LS-AA-125, Corrective Action Program, Revision 21

Notifications

20709632	20717253	20717253	20728828	20729298	20736682*
20737358*	20738028*	20738030*	20738075*	20739067*	20743259*

Drawings

203038-B-9772, 2B Emergency Diesel Generator, Sheet 2  
203038-A, 1B 4160V Vital Bus Flex Breaker 1B5D, Sheet 3

Maintenance Orders/Work Orders

30150835      50178115      60125541      70179878      70184008

Miscellaneous

SC 16-03 RO, GE Hitachi Nuclear Energy 10 CFR Part 21 Communication, May 12, 2016

**Section 40A3: Follow-up of Events and Notices of Enforcement Discretion**

Procedures

ER-AA-1001, Component Classification, Revision 3  
ER-AA-2001-1001, Evaluation of Equipment Reliability Strategies, Revision 1  
ER-AA-2004, System Vulnerability Review Process, Revision 7  
ER-AA-2013, Processing Maintenance Strategies Using IQReview, Revision 0  
ER-AA-310-1001, Maintenance Rule – Scoping, Revision 6  
ER-SA-310-1009, Salem Generating Station - Maintenance Rule Scoping, Revision 5  
LS-AA-120, Issue Screening and Identification Process, Revision 13  
LS-AA-125, Corrective Action Program, Revision 21  
LS-AA-125-1003, Apparent Cause Evaluation Manual, Revision 14  
MA-AA-716-210-1001, Performance Centered Maintenance (PCM) Template, Revision 12  
MA-AA-716-210-1005, Predefine Change Processing, Revision 7

Notifications

20713304      20718245      20718508      20722054      20741421\*

Drawings

601216, 2 Generator - Runback Logic, Revision 9  
601226, No. 2 Unit - Turbine Generator Turbine Trip Regular, Revision 16  
601227, No. 2 Unit - Turbine Generator Turbine Trip Back-up, Revision 18  
601703, No. 2 Unit Stator Winding Cooling Water System, Revision 12

Maintenance Orders/Work Orders

60128033      70184214      70184453      70185139

Other Documents

S-16-0020, ER Strategy for 62-C1 Stator Cooling Relay, 5/11/2016  
System Health Report, Unit 2 GEN – Main Generator, Q1-2016  
System Health Report, Unit 2 GEN – Main Generator, Q2-2016  
System Vulnerability Review Report Salem Unit 2 Main Generator, 6/1/2016

Miscellaneous

IQReview database information for S2GEN-2GW75  
IQReview database information for S2GEN-2MSE2-GEN-62-C1  
IQReview database information for S2GEN-2FD7359  
IQReview database information for S2GEN-2GW92  
IQReview database information for S2CA-2CA2158  
IQReview template information for Valves – Manual Valves

**Section 40A7: Licensee Identified Violations**

Procedures

SC.MD-FR.DCS-0006(Q) Sealing, Drying, and Backfilling of a Loaded MPC

Miscellaneous

Form 4 Cask Load Data for Thermal Based CoC Surveillances, dated 05/24/2016, SC.RE-FR.DCS-0002(Q)

Holtec HI-STORM Certificate of Compliance 72-1014 Amendment 5

Holtec HI-STORM Final Safety Analysis Report for the HI-STORM 100 Cask System, Report HI-2002444, Revision 7

Holtec Response to Request for Technical Information 2631-001R0, 07/13/2016

Salem 2 Campaign 2 Cask 3 MPC358 Basket Layout

Salem 2 Campaign 2 Cask 4 MPC356 Basket Layout

Technical Evaluation 80117971-0010, CoC LCO 3.1.1 Low Backfill Evaluation for MPCs 356 and 358

Technical Evaluation 80117971-0020, Review of Holtec Response to Request for Technical Information 2631-001R0

**LIST OF ACRONYMS**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
CA	corrective action(s)
CAP	corrective action program
CFCU	containment fan coil unit
CFR	Code of Federal Regulations
EDG	emergency diesel generator(s)
FHB	fuel handling building
FIN	findings
GPI	Groundwater Protection Initiative
IMC	Inspection Manual Chapter
IR	Inspection Report
kV	kilovolt
LER	licensee event report
MPC	multi-purpose canister
MR	maintenance rule
MSPI	Mitigating System Performance Index
NCV	non-cited violation
NEI	Nuclear Energy Institute
NI	nuclear instrumentation
NOTF	notification(s)
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
ODCM	Offsite Dose Calculation Manual
OHA	overhead annunciator
OOS	out of service
OWA	operator workaround(s)
PCM	performance centered maintenance
PI	performance indicator
PM	preventive maintenance
PSEG	Public Service Enterprise Group Nuclear LLC
RCP	reactor coolant pump
REMP	Radiological Environmental Monitoring Program
SDP	significance determination process
SGFP	steam generator feedwater pump
SL	severity level
SPV	single point vulnerability
SSC	structure, system, and component(s)
SW	service water
SWC	stator water cooling
TS	technical specification(s)
UFSAR	Updated Final Safety Analysis Report