



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
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August 8, 2017

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 05000272/2017002 AND  
05000311/2017002

Dear Mr. Sena:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Salem Nuclear Generating Station (Salem), Units 1 and 2. On July 13, 2017, the NRC inspectors discussed the results of this inspection with Mr. Patrick Martino, Salem Plant Manager, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two licensee-identified violations which were determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy. No NRC-identified or self-revealing findings were identified during this inspection.

If you contest the violations or significance of these NCVs, 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.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

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

P. Sena

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Enclosure:

Inspection Report 05000272/2017002 and 05000311/2017002  
w/Attachment: Supplementary Information

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SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 –  
 INTEGRATED INSPECTION REPORT 05000272/2017002 AND  
 05000311/2017002 DATED AUGUST 8, 2017

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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. 05000272/2017002 and 05000311/2017002

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Salem Nuclear Generating Station, Units 1 and 2

Location: Hancocks Bridge, NJ 08038

Dates: April 1, 2017 through June 30, 2017

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

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## SUMMARY

Inspection Report (IR) 05000272/2017002, 05000311/2017002; 04/01/2017 – 06/30/2017; Salem Nuclear Generating Station Units 1 and 2 (Salem); Routine Integrated Inspection Report.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. No NRC-identified or self-revealing findings were identified during this inspection. 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 October 28, 2016. 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 November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### **Other Findings**

Two violations of very low safety significance that were identified by PSEG were reviewed by the inspectors. Corrective actions (C/As) taken or planned by PSEG have been entered into PSEG's corrective action program (CAP). These violations and C/A tracking numbers are listed in Section 4OA7 of this report.

## REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On May 15, operators identified a rise in primary to secondary leakage, indicating a possible steam generator (S/G) tube leak that was confirmed on May 16. The leak subsequently stabilized at a rate of approximately seven gallons per day. Around May 26, the leak rate slowly fell to less than the minimum detectable level of one gallon per day and remained below that threshold for the remainder of the inspection period. The unit remained at or near 100 percent RTP for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent RTP. The unit completed a planned shutdown (S/D) on April 14 for the 2R22 refueling outage. On April 20, PSEG declared an Unusual Event due to elevated hydrazine levels in the containment atmosphere. A reactor startup was commenced on May 29 and full RTP was reached on June 2. The unit remained at or near 100 percent RTP for the remainder of the inspection period.

**1. REACTOR SAFETY****Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 1 sample)

**.1 Summer Readiness of Offsite and Alternate Alternating Current Power Systems****a. Inspection Scope**

The inspectors reviewed plant features and procedures for the operation and continued availability of the offsite and alternate alternating current (AC) power system to evaluate readiness of the systems prior to seasonal high grid loading on May 31. The inspectors reviewed PSEG's procedures affecting these areas and the communications protocols between the transmission system operator and PSEG. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether PSEG established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager, reviewing condition reports and open work orders (WOs), and walking down portions of the offsite and AC power systems including the 500 kilovolt (kV) switchyard.

**b. Findings**

No findings were identified.

## 1R04 Equipment Alignment

### .1 Partial System Walkdown (71111.04Q – 6 samples)

#### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, 12 Component cooling (CC) pump out of service (OOS) for degraded outboard bearing on June 9
- Unit 2, Unborated water system isolation during S/D on April 17
- Unit 2, Spent fuel (SF) pool cooling after full core offloaded on April 25
- Unit 2, 21 Service water (SW) nuclear header following restoration and during subsequent planned maintenance on header components on May 8
- Unit 2, 2B and 2C emergency diesel generator (EDG) mechanical and electrical support systems during planned maintenance on the 2A EDG on May 15
- Common, Control area ventilation following a radiation monitor failure on May 8

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, and notifications (NOTFs). 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.

## 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 (FP) features. The inspectors verified that PSEG controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that FP 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 FP equipment, as applicable, in accordance with procedures.

- Unit 1, 4kV and 480V switchgear (SWGR) rooms on April 26
- Unit 1, Diesel fuel oil storage tank and fuel oil transfer pump areas on May 15
- Unit 1, EDGs and fuel oil day tank area on May 15
- Unit 1, Turbine building on June 22



- Unit 2, 230V/460V SWGR for continuous fire watch on April 3
- Unit 2, Auxiliary building SF pool cooling pump area on April 26

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the site flooding analysis and plant procedures to identify internal flooding susceptibilities for the site. The inspectors' review focused on the Unit 1 and Unit 2 4 kV vital SWGR rooms of the Auxiliary Building. The inspectors verified the adequacy of equipment and wall seals located below the flood line, doorway flood curbs, and floor drains. They discussed the condition of the fire water header piping, the largest potential source of flood water in this area, with the Salem FP engineer as well as reviewed the CAP to determine if PSEG was identifying and correcting problems associated with flood mitigation features.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 2 22 charging pump gear oil cooler heat exchanger (HX) readiness and availability to perform its safety functions. The inspectors observed portions of the as-found inspection of the HX. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed the results of the eddy current testing performed to measure the HX tube wall thickness. The inspectors verified that PSEG initiated appropriate C/As for identified deficiencies. The inspectors also verified that the number of tubes plugged within the HX did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R08 In-Service Inspection (71111.08P – 1 sample)

a. Inspection Scope

From April 24 to May 3, the inspectors conducted an inspection and review of in-service inspection (ISI) activities in order to assess the effectiveness of PSEG's program for monitoring degradation of the reactor coolant system boundary, risk-significant piping boundaries, and the containment system boundaries during the 2R22 refueling outage.

### Non-destructive Examination and Welding Activities (IP Section 02.01)

The inspectors observed a sample of in-process non-destructive examinations (NDE), reviewed completed documentation, and interviewed PSEG personnel to verify that the NDE activities performed as part of the fourth interval, second period, of the Unit 2 ISI program were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2004 Edition with no Addenda. For augmented examinations, the inspectors verified that activities were performed in accordance with PSEG's augmented inspection program and procedures, and with any applicable industry guidance documents. The inspectors verified that indications and effects, if present, were dispositioned in accordance with the ASME Code or an NRC-approved alternative, and verified that relevant indications were compared to previous examinations to determine if any changes had occurred.

Activities included a review of ultrasonic testing (UT), liquid penetrant testing (LPT), and visual testing (VT). The inspectors reviewed certifications of the NDE technicians performing the examinations and verified that the inspections were performed in accordance with qualified NDE procedures and industry guidance. For UT activities, the inspectors also verified the calibration of equipment used to perform the examinations. The inspectors verified that the test results were reviewed and evaluated by certified Level III NDE personnel as directed by PSEG procedures and that the parameters used in the test were in accordance with the limitations, precautions, and prerequisites specified in the test procedure.

#### ASME Code Required Examinations:

- Direct observation of the manual UT of the 22 S/G shell to upper head weld (22-STG-USUH).
- Record review of the manual UT of the auxiliary feedwater (AFW) pipe to pipe weld (4-AF-2241-3).

#### Other Augmented, License Renewal, or Industry Initiative Examinations:

- Record review of the LPT of the residual heat removal (RHR) pipe to elbow weld (12-RH-2252-39) and adjacent surface material as part of the owner augmented program to exam components susceptible to external chloride stress corrosion cracking.
- Direct observation of the remote UT of the baffle-former bolts and VT of the baffle-former assembly, including baffle-edge bolts, inside the reactor vessel as part of the aging management program MRP-227-A, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines." The inspectors verified that UT results were dispositioned in accordance with PSEG's procedure and C/As were in accordance with NRC requirements. The inspectors verified that PSEG's actions were in-progress to replace all of the potentially degraded baffle-former bolts prior to Unit 2 restart from the 2R22 refueling outage, which included 9 bolts with UT indications, out of a total of 832. PSEG replaced a total of 129 baffle-former bolts. The inspectors did not identify any deviations from MRP-227-A.

### Examination of Previous Indications

The inspectors did not review any previous indications because there were no relevant indications from the previous outage that required re-examination or evaluation for continued service at this time.

### Welding on Pressure Boundary Systems

The inspectors reviewed the pressure boundary risk-significant welding activity, including the associated NDE, of multiple pipe welds (2-RH-105-A/B/D, 2-RH-105-1, 2-RH-104-F) and one pipe to valve weld (2-RH-105-2) as part of a repair/replacement activity in the RHR system. Specifically, the scope of the activity was to cut out and replace a section of piping identified as having surface indications with a spool of new pipe. The inspectors directly observed a sample of in-shop welding and performed a documentation review of the remaining welding activities to verify that the welding, NDE, and final acceptance were performed in accordance with the ASME Code requirements. The inspectors reviewed the weld procedure specification to ensure it contained the required essential and supplemental essential weld variables and that those variables were within the ranges demonstrated by the supporting qualification record. The inspectors also reviewed the weld records to determine if they were performed with the base and weld filler materials listed in the welding specification. The repair was performed under WO 60130174.

### Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities (IP Section 02.02)

No reactor vessel head inspections were performed during this refueling outage.

The inspectors verified that the reactor pressure vessel upper head penetration ultrasonic weld examinations and the bare metal visual examinations were scheduled in accordance with the periodicity requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a and ASME Code Case N-729-1, "Alternative Examination Requirements for pressurized water reactor (PWR) Reactor Vessel Upper Heads," to ensure the structural integrity of the reactor vessel head pressure boundary. Because the Unit 2 reactor vessel upper head was replaced with nozzles and welds made of PWSCC-resistant materials, the examinations do not have to be performed every refueling outage.

### Boric Acid Corrosion Control Inspection Activities (IP Section 02.03)

The inspectors reviewed Salem's boric acid corrosion control program as described in PSEG procedures and discussed the program requirements with the boric acid program owner. The inspectors performed independent walkdowns of various plant areas inside the containment building and reviewed photographic records of several identified boric acid leakage locations. The inspectors reviewed a sample of condition reports to verify that degraded or non-conforming conditions were identified properly within the CAP.

The inspectors reviewed two engineering evaluations (listed in the documents reviewed section) performed for boric acid found on piping and components to determine whether PSEG properly applied applicable corrosion rates to the affected components and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity. The inspectors also reviewed the C/As planned and/or performed for those areas identified with evidence of boric acid leaks. Samples were selected based

on actions for repair, component function, significance of leakage, and location where direct leakage or impingement on adjacent locations could cause degradation of safety system components.

#### S/G Tube Inspection Activities (IP Section 02.04)

The inspectors directly observed a sample of the S/G eddy current tube examinations, which consisted of full length bobbin inspection of 100 percent of all active tubes in each of the four S/Gs; +Point probe inspection of all Appui (AREVA-specific S/G tube supports) locations in all active tubes; array probe inspection of the top-of-tubesheet peripheral tubes and no-tube lane regions; and +Point probe inspection of any special interest tubes. The inspectors reviewed the results of the examinations to determine how well PSEG was able to predict future tube performance by comparing the results with the values predicted in the previous outage operational assessment. The inspectors then evaluated the scope of eddy current testing to determine if areas of potential degradation were inspected, noting if areas known to represent eddy current challenges were included. The inspectors also compared the S/G tube eddy current examination scope and expansion criteria with TS requirements to determine whether PSEG was in compliance with these requirements.

The inspectors verified that no in-situ pressure testing was required and no primary-to-secondary leakage occurred over the operating cycle. The inspectors verified that the S/G tube examination screening criteria was in accordance with the Electric Power Research Institute Steam Generator Guidelines and that the examination technique specification sheets used for the exams were appropriate for the expected types of tube degradation. The inspectors remotely observed a Qualified Data Analyst's review of five S/G tubes to determine that proper eddy current analysis techniques were applied.

#### Identification and Resolution of Problems (IP Section 02.05)

The inspectors reviewed a sample of Salem Unit 2 C/A reports, which identified NDE indications, deficiencies, and other non-conforming conditions since the previous refueling outage and during the current outage. The inspectors verified that non-conforming conditions were properly identified, characterized, evaluated, and that C/As were identified and entered into the CAP for resolution.

##### b. Findings

No findings were identified.

#### 1R11 Licensed Operator Requalification Program (71111.11Q – 2 samples)

##### .1 Quarterly Review of Licensed Operator Requalification Testing and Training

##### a. Inspection Scope

The inspectors observed licensed operator simulator training on June 13, which included a CC HX outlet valve failure, a reactor coolant pump (RCP) seal failure, and a small break 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 (SM) and the technical specification (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 reactor S/D for refuel outage, 2R22, on April 14. 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 – 3 samples)

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 WOs, 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 C/As 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.

- Unit 1, S/G drains and blowdown on May 15
- Unit 1, Radiation monitors on May 31
- Common, 4kV breakers, and associated system functional impacts, following multiple failures to close on May 2

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, Fire risk with 23 charging pump unavailable on May 8
- Unit 1, Identification of primary-to-secondary leakage on 13 S/G on May 15
- Unit 2, Yellow risk during 2A EDG outage on April 3
- Unit 2, Yellow risk during 21 CC HX unavailability on May 8
- Unit 2, Elevated risk and protected equipment verification during entry into, and exit from, reduced inventory control on May 23 and May 24
- Common, Chilled water system cross-tie freeze seal in support of valve maintenance on April 11

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 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, 1C Safeguards equipment control cabinet door taped closed with monitoring instruments on April 25
- Unit 1, 1 SW bay following emergent failure of the 1 SW bay sump pump on May 18
- Unit 2, 22 Safety injection pump following as-found low flow condition on April 24
- Unit 2, 21 SW nuclear leader degraded joint wall thickness on April 26
- Unit 2, 22 Containment fan coil unit (CFCU) cooler tube blockage on April 28
- Common, Log statements related to compliance with TS action statements on June 16

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

Ts and Updated Final Safety Analysis Report (UFSAR) to PSEG's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed the permanent modifications listed below. The inspectors verified that the design bases, licensing basis, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the plant modifications, to verify the adequacy of the designs. The inspectors also interviewed engineering and operations personnel, to verify plant staff awareness and understanding of the modifications was consistent with design documents and installation.

- Unit 2, Design Change Package (DCP) 80109340, 21 RCP S/D seal number 1 modification on April 17
- Unit 2, DCP 80111452, replace source range and intermediate range instrumentation on June 13

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 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, 11SW223 CFCU flow control valve replacement on June 27
- Unit 2, 21 Loop T cold resistance temperature detector swap after primary ground on April 5
- Unit 2, Emergency core cooling system (ECCS) containment sump channel II replacement on May 8

- Unit 2, 21 SW nuclear header following underground piping inspection and header outage on May 9
- Unit 2, 2C EDG SW supply valve following valve and actuator replacement on May 15
- Unit 2, RHR valves following corrective and preventive maintenance on May 17
- Unit 2, RHR hot leg injection piping replacement on May 23

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance and refueling outage (2R22), conducted April 14 through May 29. The inspectors reviewed PSEGs 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 S/D 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 SF 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
- Maintenance of secondary containment as required by TSs
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Tracking of startup prerequisites, walkdown of the drywell (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.



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 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, S/G blowdown radiation monitor testing on April 19
- Unit 2, 21 RHR in-service test on April 5
- Unit 2, Full flow AFW test on April 14
- Unit 2, Containment ventilation valves, 2VC5(6) (primary containment isolation valve), on April 15
- Unit 2, Containment isolation Phase B on April 17

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**1EP2 Alert and Notification System Evaluation (71114.02 - 1 Sample)a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the Alert and Notification System (ANS). During this inspection, the inspectors conducted a review PSEG's siren testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency approved ANS Design Report to ensure PSEG's compliance with design report commitments for system maintenance and testing. Title 10 CFR 50.47(b)(5) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 - 1 Sample)a. Inspection Scope

The inspectors conducted a review of the Salem Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of key PSEG staff to respond to an emergency event and to verify PSEG's ability to activate their emergency

response facilities (ERFs) in a timely manner. The inspectors reviewed: the PSEG Nuclear LLC Emergency Plan for ERF activation and ERO staffing requirements; the ERO duty roster; applicable station procedures; augmentation test results; the most recent drive-in drill report; and C/A reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. Title 10 CFR 50.47(b) (2) and related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Maintaining Emergency Preparedness

a. Inspection Scope (71114.05 - 1 Sample)

The inspectors reviewed a number of activities to evaluate the efficacy of PSEG's efforts to maintain the Salem emergency preparedness (EP) program. The inspectors reviewed: memoranda of agreement with offsite agencies; PSEG's maintenance of equipment important to EP; records of emergency planning zone population estimates; and provisions for, and implementation of, primary, backup, and alternative ERF maintenance.

The inspectors further evaluated PSEG's ability to maintain the Salem EP program through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, actual event reports, self-assessments, and 10 CFR 50.54(t) reviews. Also, the inspectors reviewed a sample of EP-related NOTFs initiated at Salem from July 2015 through May 2017. Title 10 CFR 50.47(b) and the related requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 2 samples)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine PSEG emergency drill on June 20 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also reviewed issues related to PSEG's critique to compare inspector observations with those identified by PSEG staff in order to evaluate PSEG's critique, and to verify whether the PSEG staff was properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

## .2 Emergency Preparedness Training Observations

### a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on June 27, which required emergency plan implementation by an operations crew. PSEG planned for this evolution to be evaluated and included in performance indicator (PI) 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 - 2 samples)

##### 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.

##### Radiological Hazards Control and Work Coverage (1 sample)

The inspectors evaluated in-plant radiological conditions and performed independent radiation measurements during facility walkdowns and observation of radiological work activities. The inspectors assessed whether posted surveys; radiation work permits; worker radiological briefings and radiation protection (RP) job coverage; the use of continuous air monitoring, air sampling and engineering controls; and dosimetry monitoring were consistent with the present conditions. The inspectors examined the control of highly activated or contaminated materials stored within the SF pools and the posting and physical controls for selected high radiation areas (HRAs), locked HRAs and very HRAs to verify conformance with the occupational PI.

##### Radiation Worker Performance and Radiation Protection Technician Proficiency (1 sample)

The inspectors evaluated radiation worker performance with respect to RP work requirements. The inspectors evaluated RP technicians in performance of radiation surveys and in providing radiological job coverage.

##### b. Findings

No findings were identified.

2RS2 Occupational As Low As is Reasonably Achievable Planning and Controls  
(71124.02 – 2 samples)

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, Regulatory Guides 8.8 and 8.10, TSs, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted a review of Salem's 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.

Verification of Dose Estimates and Exposure Tracking Systems (1 sample)

The inspectors reviewed the current annual collective dose estimate; basis methodology; and measures to track, trend, and reduce occupational doses for ongoing work activities. The inspectors evaluated the adjustment of exposure estimates, or re-planning of work. The inspectors reviewed post-job ALARA evaluations of excessive exposure.

Radiation Worker Performance (1 sample)

The inspectors observed radiation worker and RP technician performance during radiological work to evaluate worker ALARA performance according to specified work controls and procedures. Workers were interviewed to assess their knowledge and awareness of planned and/or implemented radiological and ALARA work controls.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams, Unplanned Power Changes, and Unplanned Scrams with Complications (6 samples)

a. Inspection Scope

The inspectors reviewed PSEG submittals for the following Initiating Events Cornerstone PIs for the period of July 1, 2016, through June 30, 2017.

- Unit 1 Unplanned Scrams (IE01)
- Unit 2 Unplanned Scrams (IE01)
- Unit 1 Unplanned Power Changes (IE03)
- Unit 2 Unplanned Power Changes (IE03)

- Unit 1 Unplanned Scrams with Complications (IE04)
- Unit 2 Unplanned Scrams with Complications (IE04)

To determine the accuracy of the PI data reported during those periods, inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors reviewed PSEG operator narrative logs, maintenance planning schedules, condition reports, event reports, and NRC integrated IRs to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Emergency Preparedness Performance Indicators (3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP PIs: (1) drill and exercise performance; (2) ERO drill participation; and, (3) ANS reliability. The last NRC EP inspection at Salem Nuclear Generating Station was conducted in the second calendar quarter of 2016. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the second calendar quarter of 2016 through the first calendar quarter of 2017 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 7, was used as reference criteria.

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 C/As, 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 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 Semi-Annual Trend Review

### a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues that may have been documented by PSEG outside of the CAP, such as trend reports, PIs, major equipment problem lists, system health reports, MR assessments, and maintenance or CAP backlogs. The inspectors also reviewed PSEG CAP database for the first and second quarters of 2017 to assess NOTFs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the inspectors' daily condition report review (Section 4OA2.1). The inspectors reviewed the PSEG CAP trending data, conducted under LS-AA-125, to verify that PSEG personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

### b. Findings and Observations

No findings were identified.

The inspectors noted that PSEG documented a number of trends in the first and second quarters of 2017, most notably:

- PSEG documented a trend of poor housekeeping issues identified by the inspectors (NOTF 20767496). The inspectors noted that housekeeping issues could impact the ability to properly control transient combustibles in accordance with the FP program, (NOTF 20764948); and could also impact fire-in-(a)(4) risk management actions, as documented in NCV 05000272/2017001-02.
- PSEG documented a trend of safety injection check valve back-leakage (NOTF 20766650). PSEG identified issues during refuel outage surveillance testing, entered the issues in CAP, and promptly corrected the issues. ECCS check valve back-leakage has challenged the station for a number of years, as demonstrated by a 2014 freeze seal to replace a leaking check valve in a hi-head cold leg injection line, and as documented in a previous problem identification and resolution sample in NRC IR 2012-005.
- PSEG completed industry benchmarking in February 2017, and determined the station was performing numerous containment entries, at full power, when compared to other stations (NOTF 20754274). PSEG performed the benchmarking efforts following a personnel airlock door seal failure on both the inner and outer doors (NOTF 20741576) in September 2016. PSEG determined the apparent cause of the airlock seal failures was attributed to not replacing the gaskets at the specified 18-month frequency, which was further attributed to satisfactory leak rate testing consistently being performed at an increased weekly frequency in accordance with the containment leak rate testing program due to the high number of containment entries.
- PSEG identified a trend from March 2016 to March 2017, of 12 NOTFs written for FP system jockey pump performance problems (NOTF 20759159) that mostly consisted of breaker trips and short cycling. Inspectors noted these conditions frequently challenged the Salem FP system reliability, and often required opening

the piping header cross-tie with Hope Creek as a compensatory action, to maintain the required system header pressure in accordance with station FP program procedures. The inspectors noted that PSEG has taken a number of actions to try and resolve the performance problems, including replacing the jockey pump. The inspectors noted that since corrective maintenance was performed on the jockey pump motor breaker on March 31 (NOTF 20758865), the jockey pump has performed its intended function thus improving Salem FP system reliability.

The inspectors identified a trend of non-CAP maintenance feedback, identified as N3 NOTFs, written for issues where N1 NOTFs (CAP) were also appropriate. Specifically, N1 NOTFs are required, in part, for plant equipment conditions adverse to quality as described in LS-AA-120, "Issue Identification and Screening Process," Revision 15. Additionally, N1 NOTFs are reviewed and screened for operability, reportability, and maintenance rule functional failures. N3 NOTFs are intended as feedback to the WO planning process as discussed in MA-AA-716-010-1000, "Maintenance Planning," Revision 9. The inspectors identified the following N3 NOTFs also warranted N1 NOTFs in accordance with station procedures:

- N3 20762289 was written for a safeguards equipment loading time delay relay as-found calibration out of specification during planned testing. The relay was adjusted and the as-left value was satisfactory. PSEG captured the issue under N1 20762302 following inspector questioning.
- N3 20761539 was written for a reactor coolant system mid-loop level transmitter found as-found calibration out of specification. The transmitter was adjusted and the as-left value was satisfactory. PSEG captured the issue under N1 20762569 following inspector questioning.
- N3 20762722 was written for a 2C EDG lube oil heater element mounting connection that was found damaged during planned maintenance. The mounting connection and heater element were replaced. PSEG captured the issue under N1 20762927 following inspector questioning.
- N3 20760954 was written for a 2A EDG jacket water valve actuator air leak discovered during planned maintenance. The valve diagnostic testing was completed satisfactory, and the air leak was allocated to a future valve actuator overhaul. PSEG captured the issue under N1 20762898 following inspector questioning.
- Three N3 NOTFs were written for Unit 2 safety injection accumulator level transmitter as-found values being out of specification: 20760957, 20760958, and 20762955. The transmitters were adjusted and the as-left values were satisfactory. After questioning whether an N1 was warranted to capture the trend in Unit 2 level transmitter values found out of specification, PSEG captured an adverse trend associated with Unit 2 safety injection accumulator level transmitters under N1 NOTF 20767271.

The inspectors determined that none of the trends documented above were of more than minor safety significance in accordance with IMC 0612, Appendix B, Issue Screening.

#### 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 and 50.73. The inspectors reviewed PSEGs follow-up actions related to the events to assure that PSEG implemented appropriate C/As commensurate with their safety significance.

- Unit 2, Unusual Event (EN 52699) due to hydrazine gas in containment on April 20

###### b. Findings

A PSEG-identified NCV is documented in Section 4OA7 of this report.

##### .2 (Closed) Licensee Event Report (LER) 05000272/2015-002-02: Condition Prohibited by Technical Specification for One Channel of Steam Generator Level Indication Inoperable

###### a. Inspection Scope

On August 5, 2014, control room operators identified one S/G protection level channel indicator drifting high and approaching its channel deviation limit. On October 10, 2014, troubleshooting identified the level transmitter had exceeded its TS calibration acceptance criteria. The level transmitter was subsequently replaced. On February 12, 2015, PSEG completed a reportability evaluation and determined that the best estimate for when the transmitter would have exceeded its TS acceptance criteria was August 19, 2013. PSEG reported this condition under Revision 0 to this LER on April 10, 2015. After performing multiple revisions and updates to apparent cause evaluation (ACE) 70174936 conducted to assess to the equipment failure, PSEG submitted Revision 1 to this LER on July 6, 2015, and Revision 2 on November 16, 2016. Inspectors reviewed the ACE, associated C/As, interviewed station personnel, and walked down the associated plant indication.

###### b. Findings

A PSEG-identified NCV is documented in Section 4OA7 of this report. This LER is closed.

#### 4OA6 Meetings, Including Exit

On July 13, the inspectors presented the inspection results to Mr. Patrick Martino, Salem Plant Manager, 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.



40A7 Licensee-Identified Violations (994OA7 – 2 samples)

The following licensee-identified violations of NRC requirements were determined to be of very low safety significance (Green) and met the NRC Enforcement Policy criteria for being dispositioned as NCVs:

- 10 CFR 50.54(q)(2) states, in part, that the licensee shall follow and maintain the effectiveness of an emergency plan that meets the requirements in Appendix E to this part. Appendix E. IV.C.2, states, in part, that licensees shall establish and maintain the capability to assess, classify, and declare an emergency condition within 15 minutes after the availability of indications to plant operators that an emergency action level (EAL) has been exceeded and shall promptly declare the emergency condition as soon as possible following identification of the appropriate emergency classification level. Contrary to the above, on April 20, 2017, at 8:27 p.m., when the SM was informed of the presence of toxic gas (hydrazine) causing work stoppage and evacuation in the Salem Unit 2 containment, he did not promptly declare an emergency in accordance with the Salem EALs. The SM declared an Unusual Event, based on EAL HU.3.1, toxic gas that has adversely affected normal plant operations, at 9:10 p.m. (43 minutes after he had indications that the EAL was exceeded). PSEG identified that the emergency was not declared within the 15 minute requirement during a post-event review.

This performance deficiency was more than minor because it was associated with the ERO performance attribute of the Mitigating System cornerstone, and adversely affected the cornerstone objective of ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors determined that the finding was of very low safety significance (Green) in accordance with IMC 0609, Appendix B, Figure 5.4-1, because the Unusual Event was declared in a degraded or untimely manner. PSEG entered this issue into the CAP as NOTF 20763130. Because the finding was of very low safety significance (Green) and was entered into PSEG's CAP, this issue is being treated as an NCV consistent with Section 2.3.2.a of the NRC's Enforcement Policy.

- TS 3.3.1.1 requires that the reactor trip system instrumentation shown in Table 3.3-1 shall be operable. Table 3.3-1, Function 14, states there are a total of three channels, per S/G loop, of the water level low-low instrumentation. Action 6 states, in part, with the number of operable channels less than the total number of channels, the inoperable channel is to be placed in the tripped condition within 6 hours. Contrary to TS 3.3.1.1, one less than the total number of channels of S/G water level low-low was inoperable from August 19, 2013, until October 10, 2014, without being placed in the tripped condition. The condition was a licensee-identified violation because it was identified by operators in the main control room. Additional details are provided in the closure documentation for LER 05000272/2015-002-02 in report Section 40A3.2.

This performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone, and adversely affected the cornerstone objective of ensuring the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that the finding was of very low

safety significance (Green) in accordance with the screening criteria found in IMC 0609, Attachment 4, and Appendix A, Exhibit 2. PSEG entered this issue into the CAP as NOTF 20682366. Because the finding was of very low safety significance (Green) and was entered into PSEG's CAP, this issue is being treated as an NCV consistent with Section 2.3.2.a of the NRC's Enforcement Policy.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

C. McFeaters, Site Vice President  
P. Martino, Plant Manager, Salem  
M. Adair, Salem Fire Protection Program Engineer  
S. Barr, Manager, Emergency Preparedness  
T. Cachaza, Senior Regulatory Compliance Engineer  
T. Cox, DFOST Cleaning and Inspection Project Manager  
P. Fabian, Steam Generator Program Owner  
T. Giles, ISI Program Owner  
M. Hassler, Salem Radiation Protection Manager  
A. Hess, Reactor Engineering Manager  
J. Mallon, Compliance Director  
D. Mannai, Senior Director Regulatory Operations  
L. Martino, Radiation Protection Supervisor  
P. Martitz, Radiation Protection Superintendent  
D. Mora, PSEG NDE Level III  
J. Owad, Design Engineering Manager  
K. Powell, Salem Fire Marshall  
J. Schmidt, Site Welding Engineer  
W. Wikoff, Boric Acid Program Owner

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

Closed

|                      |     |   |
|----------------------|-----|---|
| 05000272/2015-002-02 | LER | Condition Prohibited by Technical Specification for One Channel of Steam Generator Level Indication Inoperable (Section 4OA7) |
|----------------------|-----|---|

**LIST OF DOCUMENTS REVIEWED**

\* Indicates NRC-identified

**Section 1R01: Adverse Weather Protection**

Procedures

SC.OP-DL.ZZ-0007, Electrical Equipment Log, Revision 17

Notifications

20765795      20766467\*

**Section 1R04: Equipment Alignment**Procedures

Lesson Plan NOS05SFP000-08, Spent Fuel Pool Cooling System  
 OP-AA-108-101, Control of Equipment and System Status, Revision 8  
 S2.OP-SO.DG-0002, 2B Diesel Generator Operation, Revision 38  
 S2.OP-SO.DG-0003, 2C Diesel Generator Operation, Revision 42  
 S2.OP-SO.SF-0002, Spent Fuel Cooling System Operation, Revision 20  
 S2.OP-SO.SW-0001, Service Water Pump Operation, Revision 28  
 S2.OP-SO.SW-0002, 21 Nuclear Service Water Header Outage, Revision 26  
 S2.OP-SO.SW-0005, Service Water System Operation, Revision 42  
 S2.OP-SO.SW-0006, Service Water Accumulator Operation, Revision 10  
 S2.OP-SO.SWV-0001, Service Water Ventilation Operation, Revision 6  
 S2.OP-ST.ZZ-0007, Refueling Operations/Unborated Water Source Isolation Valves, Revision 0

Notifications

|           |           |           |          |           |           |
|-----------|-----------|-----------|----------|-----------|-----------|
| 20732122  | 20762903* | 20764104  | 20764723 | 20765346* | 20765348* |
| 20765349* | 20767329* | 20767330* | 20764078 |           |           |

Drawings

205301, Sheet 1, Reactor Coolant, Revision 59  
 205328, Sheet 3, Chemical and Volume Control, Revision 41  
 205333, Spent Fuel Cooling, Revision 29  
 205342 Sh. 1, No. 2 Unit Service Water Nuclear Area, Revisions 81  
 205342 Sh. 2, No. 2 Unit Service Water Nuclear Area, Revisions 76  
 205342 Sh. 3, No. 2 Unit Service Water Nuclear Area, Revisions 80  
 211306, No.1 & 2 Units Diesel Generators Fuel Oil Instrument Schematic, Revision 11

Other Documents - Work Clearance Documents

|         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 4168287 | 4177389 | 4406247 | 4406617 | 4409104 | 4409415 |
| 4412275 | 4412317 | 4412318 | 4412461 |         |         |

Calculations/Drawings

205333-A-8763-26  
 S-C-SF-MDC-1240, Revision 1  
 S-C-SF-MDC-1810, Revision 13

**Section 1R05: Fire Protection**Procedures

FP-AA-1081, Fire Protection Fundamentals, Revision 1  
 FP-SA-003, Actions for Inoperable Fire Protection - Salem Station, Revision 5  
 FP-SA-1161, Salem Pre-Fire Plan U/1 Turbine Generator Area, Revision 0  
 FP-SA-1151, Salem Pre-Fire Plan U/1 Turbine Generator Area, Revision 0  
 FP-SA-1141, Salem Pre-Fire Plan U/1 Turbine Generator Area, Revision 0  
 FP-SA-1543, Salem Pre-Fire Plan U/1 Auxiliary Feedwater Pumps Area, Revision 0  
 FP-SA-1545, Salem Pre-Fire Plan U/1 Diesel Fuel Oil Storage Area, Revision 0  
 FP-SA-1555, Salem Pre-Fire Plan U/1 Diesel Generator Area, Revision 0  
 FP-SA-2541, Salem Pre-Fire Plan U/2 460V Switchgear Rooms and Corridor, Revision 0

MA-SA-716-0236, Diesel Fuel Oil Storage Tank (DFOST) Pre-Outage Preparation Setup  
and Inspection, Revision 0  
SH-PBD-AMP-XI.M30, Fuel Oil Chemistry Program  
Transient Combustible Permit for Eng. No. 20170411-05 #22 DFOST Rm. Unit 2 Aux Bldg., Fire  
Area 2FA-D6-84E

Notifications

|          |          |           |           |           |          |
|----------|----------|-----------|-----------|-----------|----------|
| 20707362 | 20758377 | 20761723* | 20761754* | 20761778* | 20764270 |
| 20764271 | 20764472 | 20764741* | 20765016* |           |          |

Work Orders

|          |          |
|----------|----------|
| 30185808 | 60131050 |
|----------|----------|

Other Documents

Salem and Hope Creek Fire Impairment Log Book, dated 5/16/17  
TCP S1FA-AB-64B-081, U1 Switchgear Room, dated 5/8/17  
TCP S2FA-AB-64A-206, U2 Switchgear Room, dated 5/7/17

**Section 1R06: Flood Protection Measures**

Procedures

SA-PRA-12, Salem Generating Station PRA Internal Flood Evaluation

Notifications

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 20645047 | 20659963 | 20660080 | 20661643 | 20701916 | 20708365 |
| 20736082 |          |          |          |          |          |

**Section 1R07: Heat Sink Performance**

Procedures

SC.MD-PM.ZZ-0026, Safety Related Lube and Gear Oil Cooler Internal Inspections,  
Revision 12

Work Orders

|          |          |          |          |
|----------|----------|----------|----------|
| 30206746 | 30206815 | 30270185 | 30275385 |
|----------|----------|----------|----------|

**Section 1R08: In-Service Inspection**

Procedures

03-1246524, Instructions for Plug Inspection, Revision 12  
54-ISI-400, Multi-Frequency Eddy Current Examination of Tubing, Revision 21  
54-ISI-805, PDI Generic Procedure for Ultrasonic Examination of Reactor Pressure Vessel  
Welds PDI-UT-6, Revision 9  
54-ISI-835, Ultrasonic Examination of Ferritic Pipe Welds, Revision 15  
ER-AP-331, Boric Acid Corrosion Control (BACC) Program, Revision 5  
ER-AP-331-1001, Boric Acid Corrosion Control (BACC) Inspection Locations, Implementation  
and Inspection Guidelines, Revision 6  
ER-AP-331-1002, Boric Acid Corrosion Control Program Identification, Screening, and  
Evaluation, Revision 6

ER-AP-331-1004, Boric Acid Corrosion Control (BACC) Training and Qualification, Revision 3  
 ER-AP-420, Steam Generator Management Program, Revision 13  
 ER-AP-420-0051, Conduct of Steam Generator Management Program Activities, Revision 18  
 WDI-STD-1073, Ultrasonic Test Procedure for the Inspection of Internal Hex Head  
 Baffle-Former Bolts with Welded Lock Bars, Revision 5  
 Welding Procedure Specification WBM-NWP-7, Manual GTAW of P-8 to P-8 Material,  
 Revision 0

Notifications

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 20760868 | 20761976 | 20762331 | 20762486 | 20762545 | 20763513 |
| 20763664 | 20763703 | 20763976 |          |          |          |

Drawings

207498, Sheet 1, Penetration Sleeve Assembly Drawing, Revision 14  
 9046169, ASME Calibration Standard As-Built Drawing, Revision 0  
 A-62, Salem U2 - Weld/Hanger ISI Drawing of Residual Heat Removal System, Revision 2  
 B-68, Salem U2 - Weld/Hanger ISI Drawing of Residual Heat Removal System, Revision 2  
 B-123, Salem U2 - Weld/Hanger ISI Drawing of Auxiliary Feedwater System, Revision 1  
 BUEPSA/NGV9902, Sheet 1, General Drawing Replacement Steam Generators for Salem  
 Unit 2, Revision K

Work Orders

50182341    60130174

Miscellaneous

51-9118973, Qualified Eddy Current Examination Techniques for Salem Unit 2 AREVA 61/19T  
 Steam Generators, Revision 4  
 51-9225803, Salem Unit 2 Condition Monitoring for 2R20 and Final Operational Assessment for  
 Cycles 21 and 22, dated August 7, 2014  
 51-9266511, Salem Unit 2 2R22 Degradation Assessment - Spring 2017, dated April 21, 2017  
 51-9266999, Salem Unit 2 2R22 SG Eddy Current Inspection Plan, Revision 0  
 Boric Acid Evaluation for Component S2RC -22RC10 (NOTF 20760868), dated April 24, 2017  
 Boric Acid Evaluation for Component S2SJ -23SJ388 (NOTF 20699491), dated  
 September 11, 2015  
 Eddy Current Testing Screenshots for Steam Generator 22 Tubes R62C62, R73C77, and  
 R92C54, dated May 1, 2017  
 Eddy Current Testing Screenshots for Steam Generator 23 Tubes R86C64 and R92C62, dated  
 May 1, 2017  
 Integrated Strategic Plan for Long-Term Protection from External Chloride Stress Corrosion  
 Cracking, dated July 7, 2011  
 ISI-S2-LTP4, ISI Program Plan Fourth Ten-Year Inspection Interval Salem Generating Station  
 Unit 2, Revision 2  
 LR-N12-0157, Submittal of Relief Request Associated with the Fourth Ten-Year Inservice  
 Inspection (ISI) Interval Code Edition, dated June 7, 2012  
 LR-N13-0123, Request for Authorization to Continue Using a Risk-Informed Inservice Inspection  
 Alternative to the ASME Boiler and Pressure Vessel Code Section XI Requirements  
 for Class 1 and 2 Piping, dated July 9, 2013  
 LR-N16-0025, Salem Unit 2 Owner's Activity Report for S2RFO21, dated February 26, 2016  
 PSEG Nuclear Repair Program Manual, Revision 22  
 PT Data Sheet for Weld 2-RH-105-D, dated May 15, 2017

PT Data Sheet for Weld 2-RH-105-E, dated May 8, 2017  
 PT-17-002, PT Data Sheet for Weld 12-RH-2252-39 (Summary 573390), dated April 17, 2017  
 Radiographic Data Sheet for Weld 2-RH-105-1, dated May 5, 2017  
 Radiographic Data Sheet for Weld 2-RH-105-A, dated May 6, 2017  
 Radiographic Data Sheets for Welds 2-RH-104-F, 2-RH-105-2 and 2-RH-105-B, dated  
 May 12, 2017  
 Salem Unit 2 Inservice Inspection Final Outage Report for Refueling Outage S2RFO21, dated  
 February 25, 2016  
 S-C-MPOO-MGS-001, Piping Specification SPS-51 for Residual Heat Removal, Revision 5  
 UT-17-020, UT Data Sheet for Weld 4-AF-2241-3 (Summary 329320), dated April 21, 2017  
 UT-17-029, UT Data Sheet for Weld 22-STG-USUH (Summary 272850), dated April 26, 2017  
 VEN-17-001, VT Data Sheet for Reactor Vessel Baffle Edge and Angle Bolts (Summary  
 970060), dated May 1, 2017  
 WDI-PJF-1317681-FSR-001, Field Service Report for Salem Unit 2 Baffle-Former Bolt  
 Ultrasonic Inspections, Revision 0  
 WDI-TJ-1062, Technical Justification for the Ultrasonic Inspection of Internal Hex Head  
 Baffle-Former Bolts with Welded Lock Bars, Revision 2  
 Weld History Records 79591 through 79600 for WO 60130174, dated May 15, 2017  
 Weld Pictogram for WO 60130174 on Line 2-RH-104, dated April 27, 2017  
 Weld Pictogram for WO 60130174 on Line 2-RH-105, dated April 27, 2017

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

#### Procedures

S2.OP-AB.RCP-0001, Reactor Coolant Pump Abnormality, Revision 22  
 2-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 32  
 2-EOP-TRIP-3, Safety Injection Termination, Revision 31

#### Other Documents

S-ESG-1702, NRW Overflow and RCP Seal Failure with Small Break LOCA, Revision 0

### **Section 1R12: Maintenance Effectiveness**

#### Procedures

ER-AA-310, Implementation of the Maintenance Rule, Revision 13  
 ER-AA-2002, System Health Indicator Program, Revision 16  
 ER-AA-2030, Conduct of Plant Engineering Manual, Revision 13

#### Notifications

|          |          |           |           |           |           |
|----------|----------|-----------|-----------|-----------|-----------|
| 20683597 | 20748458 | 20762362* | 20763605* | 20768819* | 20768820* |
| 20766326 | 20750692 | 20763055  | 20762277  | 20762591  | 20762295  |
| 20762585 | 20762277 | 20762278  | 20762279  | 20761979  | 20762219  |
| 20762220 |          |           |           |           |           |

#### Work Orders

|          |          |          |
|----------|----------|----------|
| 60127910 | 70191071 | 70193583 |
|----------|----------|----------|

#### Other Documents

Event Notification 52681

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

Procedures

OP-AA-101-112-1002, On-Line Risk Assessment, Revision 3  
 OP-AA-108-101, Control of Equipment and System Status, Revision 8  
 OP-AA-108-116, Protected Equipment Program, Revision 12  
 OP-SA-108-115-1001, Operability Assessment and Equipment Control Program, Revision 10  
 OU-AA-103, Shutdown Safety Management Program, Revision 23  
 OU-SA-105, Shutdown Safety Management Program - Salem Annex, Revision 9  
 S1.OP-AB.SG-0001, Steam Generator Tube Leak, Revisions 21 & 22  
 S2.OP-AR.ZZ-0003, C-19 SFP Temp Hi Alarm Response Procedure, Revision 19  
 S1.OP-AB.SG-0001, Steam Generator Tube Leak, Revision 21  
 SC.ER-PS.FP-0001-A4, Fire Events in Maintenance Rule (a)(4) Risk Evaluations, Revision 0  
 WC-AA-105, Work Activity Risk Management, Revision 6

Notifications

|          |          |          |           |          |          |
|----------|----------|----------|-----------|----------|----------|
| 20544137 | 20702636 | 20764498 | 20764594* | 20764596 | 20764891 |
| 20764926 | 20765132 | 20761457 | 20770712  | 20770194 | 20766040 |
| 20766038 | 20765846 | 20727153 | 20647694  | 20766551 | 20764904 |
| 20764901 | 20764816 | 20765496 | 20764498  | 20764891 | 20764496 |
| 20764497 | 20764926 | 20590109 |           |          |          |

Drawings

AF-1, Auxiliary Feed System, Revision 3  
 205336, Salem Nuclear Generating Station Number 2 Auxiliary Feedwater, Revision 52

Work Orders

60132175    60133347    60133759    70186162

Other Documents

80113989, Salem 2R22 Shutdown Safety Evaluation and Approval, dated 3/31/17  
 ACM 17-004, 13 Steam Generator Tube Leak Radiation Monitoring, Revisions 0 and 1  
 EPRI 1022832, Steam Generator Management Program: PWR Primary-to-Secondary Leak Guidelines, Revision 4  
 LR-N17-0009, PSEG Letter to the USNRC, Steam Generator Tube Inspection Report - Twenty-Fourth Refueling Outage (1R24), dated 1/20/17  
 NEI 97-06, Steam Generator Program Guidelines, Revision 3  
 NRC Inspection Manual Part 9900 Technical Guidance, Steam Generator Tube Primary-To-Secondary Leakage, dated 9/9/03  
 Salem Generating Station Unit 2 Risk Assessment Work Week 714  
 Salem Unit 2 Safety Functional Assessment Trees (SFATs) for Refueling Outage 2R22  
 Salem Unit 2 Shutdown Risk Status Sheet, dated 5/8/17 – 5/12/17  
 TAC No. MA9163, Indian Point 2 Steam Generator Tube Failure Lessons-Learned Report Final Report, dated 10/23/00



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

OP-SA-108-115, Operability Determinations and Functionality Assessments, Revision 4  
 OP-SA-108-115-1001, Operability Assessment and Equipment Control Program, Revision 10  
 S2.OP-SO.SW-0005, Service Water System Operation, Revision 42

Notifications

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 20762366 | 20762376 | 20763522 | 20760898 | 20762761 | 20765801 |
| 20760904 | 20717850 | 20768875 | 20762881 | 20762881 |          |

Work Orders

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 80120229 | 70193685 | 80110461 | 60122516 | 60115357 | 70194900 |
| 70193618 |          |          |          |          |          |

Other Documents

NRC Inspection Manual Chapter 0326, Operability Determinations & Functionality Assessments  
 for Conditions Adverse to Quality or Safety, dated 12/3/15  
 OP-SA-108-115-1001 Attachment 4-1, Technical Specification Action Statement Log, dated  
 5/19/17

**Section 1R18: Plant Modifications**Procedures

SC.RE-FR.ZZ-0019, Reactor Engineering - Refueling, Revision 27

Notifications

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 20761796 | 20743918 | 20763771 | 20759278 | 20760519 | 20762435 |
|----------|----------|----------|----------|----------|----------|

Work Orders

|          |          |          |          |
|----------|----------|----------|----------|
| 80119467 | 80109340 | 70165309 | 80111452 |
|----------|----------|----------|----------|

Other Documents

OTDM S-17-0005, 21 Reactor Coolant Pump

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

ER-AA-321, Administrative Requirements for Inservice Testing, Revision 13  
 MA-AA-716-012, Post Maintenance Testing, Revision 20  
 S2.IC-CC.WD-0013, 2LT-939 Containment Sump Level Channel II, Revision 12  
 S2.IC-FT.RCP-0001, 2TE-411A-B #21 Rx Coolant Loop Delta T-Tavg Protection Channel I,  
 Revision 57  
 S2.OP-ST.SJ-0020, Periodic Leakage Test RCS Pressure Isolation Valves, Revision 21  
 S2.RA-ST.DG-0003, Inservice Testing 2C Diesel Generator Surveillance Test Acceptance  
 Criteria, Revision 7  
 S2.RA-ST.RHR-0004, Inservice Testing Residual Heat Removal Valves Acceptance Criteria,  
 Revision 7

Notifications

|          |          |           |          |          |           |
|----------|----------|-----------|----------|----------|-----------|
| 20761505 | 20762577 | 20764428* | 20764475 | 20764661 | 20764662* |
| 20764824 | 20764848 | 20764287  | 20764237 | 20762557 | 20762558  |
| 20763948 | 20763190 |           |          |          |           |

Drawings

671332, Sheet 1, Unit 2 Residual Heat Removal, Revision 0  
 671332, Sheet 2, Unit 2 Residual Heat Removal, Revision 0  
 205232, Sheet 1, Unit 1 Residual Heat Removal, Revision 39  
 205232, Sheet 2, Unit 1 Residual Heat Removal, Revision 38  
 625017, Sheet 1, Unit 2 Building and Equipment Drains Containment Sump Pump Level  
 2LT939, Revision 1  
 240698, Sheet 1, Unit 2 Sumps and Flood Pumps – Contaminated, Revision 10  
 211514, Sheet 2, Unit 2 Residual Heat Removal System Containment Sump Level LT-939,  
 Revision 15

Work Orders

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 30088150 | 30164489 | 30164521 | 30206683 | 30207070 | 30258534 |
| 30270436 | 30270645 | 30270704 | 30271195 | 30309923 | 60090744 |
| 60094634 | 60129677 | 60130174 | 60134270 | 60134353 | 60134573 |
| 30272176 | 50181407 | 50166967 | 50153683 | 50140018 |          |

Other Documents

30088150-080, 23SW39 AOV Test Evaluation, dated 5/17/17  
 21 SW Header Inspection Video (RAP Tunnel to Aux Bldg), dated 4/28/17  
 21 SW Header Inspection Video (SW Bay #2 to RAP Tunnel), dated 4/26/17  
 PSE1701R0, Final Report of AMS Tests – Response Time Testing of Primary Coolant RTDs at  
 Salem Unit 2  
 SC-WD001-01, Salem Unit 1 & 2 Containment Sump Level Indication and Level Switch,  
 Revision 4  
 S2.OP-ST.DG-0003, 2C Diesel Generator Surveillance Test, performed 5/4/17  
 S2.OP-ST.RHR-0004, Inservice Testing Residual Heat Removal Valves, performed 5/17/17

Calculations

S-C-SW-NDC-2143, SVCE WTR DSL GEN JKT CLR INLET, Revision 1

Non Destructive Examinations

30206683-300, VT-2 Visual Examination, performed 5/9/17  
 30270436-220, VT-2 Visual Examination, performed 5/8/17  
 30270704-590, VT-2 Visual Examination, performed 5/8/17  
 30271195-1570, VT-2 Visual Examination, performed 5/8/17  
 60130174-190, VT-2 Visual Examination, performed 5/15/17

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

NF-AA-310, Special Nuclear Material and Core Component Movement, Revision 15  
 S2.OP-AB.FUEL-0001, Fuel Handling Incident, Revision 5  
 S2.OP-IO.ZZ-0009, Defueled to Refueling, Revision 30  
 S2.OP-IO.ZZ-0010, Spent Fuel Pool Manipulations, Revision 34

S2.OP-IO.ZZ-0011, Control Room Operability with Unit 2 Defueled, Revision 7  
 S2.OP-IO.ZZ-0109, Defueled to Refueling Administrative Requirements, Revision 6  
 S2.OP-SO.SF-0009, Refueling Operations, Revision 19  
 S2.P-ST-SJ-0010, ECCS – Containment Inspection For Mode 4, Revision 6  
 SC.MD-FR.CAN-0001, Outage Equipment Hatch Installation, Removal, Seal Replacement and Door Manipulation for Containment Closure, Revision 20  
 SC.RE-FR.ZZ-0001, Salem Generating Station/Reactor Engineering Fuel Handling, Revision 52  
 SC.RE-FR.ZZ-0002, New Fuel Receipt and Storage, Revision 22

Notifications

|           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 20760977  | 20762303* | 20762311  | 20764528  | 20765143* | 20765272* |
| 20765690* | 20765748* | 20765759* | 20765762* | 20765816* | 20765822* |
| 20765824* | 20765825* | 20765827* | 20765829* | 20765830* | 20765386* |
| 20765400  | 20771475* |           |           |           |           |

**Section 1R22: Surveillance Testing**

Procedures

S2.OP-ST.RHR-0001, IST 21 Residual Heat Removal Pump, Revision 31  
 S2.OP-ST.SSP-0006, Engineered Safety Feature Containment Isolation – Phase B, Revision 16  
 S2.OP-ST.AF-0007, IST Auxiliary Feedwater Valves Mode 3, Revision 22  
 S2.RA-ST.AF-0007, IST Auxiliary Feedwater Valves Mode 3 Acceptance Criteria, Revision 12  
 S2.RA-ST.RHR-0001, IST 21 Residual Heat Removal Pump Acceptance Criteria, Revision 13

Notifications

|           |          |          |           |           |           |
|-----------|----------|----------|-----------|-----------|-----------|
| 20761748  | 20761750 | 20761832 | 20762815* | 20767219* | 20768741* |
| 20768804* |          |          |           |           |           |

Work Orders

|          |          |          |          |
|----------|----------|----------|----------|
| 50167213 | 50180841 | 50181109 | 50192363 |
|----------|----------|----------|----------|

**Section 1EP2: Alert and Notification System Evaluation**

Procedures

EP-AA-121-1002, PSEG Alert Notification System (ANS) Program, Revision 1  
 EP-AA-121-1004, PSEG ANS Corrective Maintenance, Revision 1  
 EP-AA-121-1005, PSEG ANS Preventive Maintenance Program, Revision 2  
 EP-AA-121-1006, PSEG ANS Siren Monitoring, Troubleshooting, and Testing, Revision 1

Notifications

|          |          |
|----------|----------|
| 20731787 | 20762139 |
|----------|----------|

Other Documents

ANS Maintenance Records, July 2015 – May 2017  
 ANS Test Records, July 2015 – May 2017  
 Final 2005 REP-10 Design Review Report, PSEG Salem and Hope Creek Generating Stations, American Signal Corporation, Revision 1  
 Letter from FEMA Region II to PSEG, PSEG Salem Hope Creek Nuclear Power Plant Public Alert and Notification System Design Report, dated 4/11/2017

PSEG Nuclear LLC Emergency Plan, Section 6.0, Notification Methods – Response Organizations, Revision 19

**Section 1EP3: Emergency Response Organization Staffing and Augmentation System**

Procedures

EP-AA-120-1007, Maintenance of Emergency Response Organization, Revision 7  
EP-AA-120-1010, ERO Training Administration, Revision 1  
EP-AA-121-1001, Automated Call-Out System Maintenance, Revision 2  
EP-AA-121-1007, Primary Emergency Callout System Recovery Guide, Revision 2

Notifications

20736246      20737470      20738162      20763707

Other Documents

ERO Rosters dated 12/6/2015, 11/24/2016, and 3/8/2017  
ERO Training Records dated 6/7/2017  
Hope Creek Generating Station and Salem Generating Station, On-Shift Staffing Analysis Report, Revision 0  
Monthly pager test results July 2015 – May 2017  
PSEG Nuclear LLC Emergency Plan, Section 3.0, Emergency Organization, Revision 29  
PSEG Nuclear LLC Emergency Plan, Section 16.0 Radiological Emergency Response Training, Revision 23

**Section 1EP5: Correction of Emergency Preparedness Weaknesses**

Procedures

EP-AA-120, Emergency Plan Administration, Revision 16  
EP-AA-121, Emergency Response Facilities and Equipment Readiness, Revision 3  
EP-AA-121-1003, Equipment Important to Emergency Response – Work Prioritization, Revision 3  
EP-AA-124, Inventories and Surveillances, Revision 1  
EP-AA-124-1001, Facilities Inventories and Equipment Tests, Revision 2  
EP-AA-124-1001, Facilities Inventories and Surveillances, Revision 2  
EP-AA-125, Emergency Preparedness Self Evaluation Process, Revision 1  
WC-AA-106, Work Week Screening and Processing, Revision 19

Notifications

20698531    20702801    20705922    20708995    20711391    20711407  
20712348    20737470    20738714    20739070    20743962    20746208  
20746302    20751841    20752762    20755471    20759469    20763130  
20763307    20765649    20765861

Other Documents

Audit NOSA-HPC-15-02, Emergency Plan, Procedures, Facilities, and Interfaces Audit Report, dated 4/6/2016  
Audit NOSA-HPC-17-02, Emergency Plan, Procedures, Facilities, and Interfaces Audit Report, dated 4/5/2017  
Check-In Self-Assessment (80115825) for NRC Annual Emergency Preparedness (EP) Program Inspection, dated 2/12/2016

Check-In Self-Assessment (80118715) for Fukushima Compliance Matrix Assessment, dated 12/8/2016

Check-In Self-Assessment (80119256) for NRC Annual Emergency Preparedness (EP) Program Inspection, dated 4/3/2017

EP-AA-124-1001-F12, Communications Checklists – Salem Station, performed 10/20/2016, 11/20/2016, and 12/28/2016

EP-AA-124-1001-F2, TSC Equipment Test – Software Inventory, performed 3/6/2016

EP-AA-124-1001-F7, Emergency Operations Facility Inventory, performed 9/29/2016

EP-AA-124-1002, Attachment 1, Salem Generating Station Emergency Equipment Inventory – Main Control Point, performed 3/16/2017

EP-AA-124-1002, Attachment 2, Salem Control Room/OSC Emergency Equipment Inventory, performed 12/8/2016

Memorandum of Understanding between Department of Commerce – National Weather Service and PSEG Nuclear, LLC, dated 2/26/2016

Memorandum of Understanding Cumberland County Office of Emergency Management and PSEG Nuclear, LLC, dated 3/4/2016

Memorandum of Understanding Delaware Department of Safety and Homeland Security, Delaware Emergency Management Agency and PSEG Nuclear, LLC, dated 6/9/2016

Memorandum of Understanding GE Hitachi Nuclear Energy and PSEG Nuclear, LLC, dated 3/1/2016

Memorandum of Understanding Haz/Med Consultants and PSEG Nuclear LLC, dated 3/2/2016

Memorandum of Understanding Kent County Department of Public Safety Kent County EOC and PSEG Nuclear, LLC, dated 5/27/2016

Memorandum of Understanding Maryland Emergency Management and Civil Defense Agency/NJ State Police, dated 4/13/2016

Memorandum of Understanding Memorial Hospital of Salem County and PSEG Nuclear, LLC, dated 3/4/2016

Memorandum of Understanding New Castle County Delaware, Delaware Emergency Management Agency and PSEG Nuclear, LLC, dated 5/11/2016

Memorandum of Understanding NJ State Police/NJ Department of Environmental Protection/PSEG, dated 3/10/2016

Memorandum of Understanding Pennsylvania Emergency Management Agency/NJ State Police, dated 4/13/2016

Memorandum of Understanding Salem County Department of Emergency Services and PSEG Nuclear, LLC, dated 3/4/2016

Memorandum of Understanding Township of Lower Alloways Creek and PSEG Nuclear, LLC, dated 12/6/2016

Memorandum of Understanding Westinghouse Electric Company, LLC and PSEG Nuclear, LLC dated 3/15/2016

Memorandum of Understanding Wilmington Fire Department and PSEG Nuclear, LLC, dated 3/1/2016

PSEG Nuclear LLC Emergency Plan, Section 15 Exercises and Drills, Revision 16

PSEG Nuclear LLC Emergency Plan, Section 4 Emergency Response Support and Resources, Revision 14

PSEG Nuclear LLC Emergency Plan, Section 9 Emergency Facilities and Equipment, Revision 25

S16-01, Drill Critique Report, dated 7/18/2016

S16-16, Drill Critique Report, dated 12/14/2016

Salem Unit 1 7/11/2015 CO2 Discharge Unusual Event, dated 9/30/2015

Salem Unit 2 11/23/2015 Reactor Coolant System Leak Unusual Event, dated 12/21/2015

Salem Unit 2 4/20/2017 Hydrazine in Containment Unusual Event, dated 5/2/2017  
WO #50178395, 1R18 Channel/Detect Calibration, performed 1/20/2017  
WO #50190479, 1R18 Liquid Rad Waste Monitor Channel Functional Test, performed 2/2/2017

**Section 1EP6: Drill Evaluation**

Procedures

S2.OP-AB.RCP-0001, Reactor Coolant Pump Abnormality, Revision 22  
S2.OP-AR.ZZ-0012, Control Console 2CC2, Revision 39  
S2.OP-SO.AF-0001, Auxiliary Feedwater System Operation, Revision 43  
S2.OP-SO.CVC-0006, Boron Concentration Control, Revision 25  
S2.OP-SO.DG-0003, 2C Diesel Generator Operation, Revision 42  
S2.OP-SO.GS-0001, Turbine Gland Sealing Steam Operation, Revision 10  
2-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 32  
2-EOP-TRIP-3, Safety Injection Termination, Revision 31

Notifications

20770243    20770155    20768901

Other Documents

S-ESG-1702, NRW Overflow and RCP Seal Failure with Small Break LOCA, Revision 0

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

Notifications

20762305    20762727    20763044    20763063    20763503    20763630

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

Notifications

20763276

**Section 4OA1: Performance Indicator Verification**

Procedures

EP-AA-125-1001, EP Performance Indicator Guidance, Revision 1  
EP-AA-125-1002, ERO Performance - Performance Indicators Guidance, Revision 5  
EP-AA-125-1003, ERO Readiness - Performance Indicators Guidance, Revision 1  
EP-AA-125-1004, ANS Reliability - Performance Indicators Guidance, Revision 1

Notifications

20715510    20735719    20758110

Miscellaneous

ANS Reliability PI data, April 2016 – March 2017  
Drill and Exercise Performance PI data, April 2016 – March 2017  
ERO Drill Participation PI data, April 2016 – March 2017

**Section 40A2: Problem Identification and Resolution**Notifications

|           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 20759297* | 20762392* | 20762510* | 20762898* | 20762927* | 20763243* |
| 20764224* | 20765277* | 20765278* | 20765511* | 20765724* | 20765725* |
| 20765726* | 20765727* | 20765729* | 20765746* | 20766360* | 20766744* |
| 20766759* | 20767234* | 20767270* | 20767271* | 20767496* | 20767515* |
| 20768627* | 20770103* | 20770101* | 20769093* | 20770167* | 20770229* |
| 20770285* | 20770286* | 20762792  | 20760957  | 20760958  | 20762955  |
| 20762303  | 20762722  | 20760954  | 20759159  | 20754274  | 20749731  |
| 20766650  | 20764948  | 20763338  |           |           |           |

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

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 20682366 | 20762368 | 20763800 | 20763963 | 20763925 | 20763130 |
| 20762978 | 20763130 | 20762804 | 20762886 | 20763084 | 20762766 |
| 20762855 | 20762368 | 20762680 |          |          |          |

Other Documents

ACE 70174936, 1LT51 Drifts Outside Technical Specification Allowable Values

**LIST OF ACRONYMS**

|        |  |
|--------|--|
| 10 CFR | Title 10 of the <i>Code of Federal Regulations</i> |
| AC     | alternating current                                |
| ACE    | apparent cause evaluation                          |
| ADAMS  | Agencywide Documents Access and Management System  |
| AFW    | auxiliary feedwater                                |
| ALARA  | as low as reasonably achievable                    |
| ANS    | Alert and Notification System                      |
| ASME   | American Society of Mechanical Engineers           |
| C/A    | corrective action                                  |
| CAP    | corrective action program                          |
| CC     | component cooling                                  |
| CFCU   | containment fan coil unit                          |
| CFR    | Code of Federal Regulation                         |
| DCP    | Design Change Package                              |
| EAL    | emergency action level                             |
| ECCS   | emergency core cooling system                      |
| EDG    | emergency diesel generator                         |
| EP     | emergency preparedness                             |
| ERF    | emergency response facility                        |
| ERO    | Emergency Response Organization                    |
| FP     | fire protection                                    |
| HX     | heat exchanger                                     |
| IMC    | Inspection Manual Chapter                          |
| IR     | Inspection Report                                  |
| ISI    | in-service inspection                              |

|       |   |
|-------|---|
| kV    | kilovolt                                    |
| LER   | licensee event report                       |
| LPT   | liquid penetrant testing                    |
| MR    | maintenance rule                            |
| NCV   | non-cited violation                         |
| NDE   | non-destructive examination                 |
| NEI   | Nuclear Energy Institute                    |
| NOTF  | notification                                |
| NRC   | Nuclear Regulatory Commission               |
| OOS   | out of service                              |
| PI    | performance indicator                       |
| PSEG  | Public Service Enterprise Group Nuclear LLC |
| PWR   | pressurized water reactor                   |
| RCP   | reactor coolant pump                        |
| RHR   | residual heat removal                       |
| RP    | radiation protection                        |
| RTP   | rated thermal power                         |
| S/D   | shutdown                                    |
| S/G   | steam generator                             |
| SDP   | significance determination process          |
| SF    | spent fuel                                  |
| SM    | shift manager                               |
| SSC   | structure, system, and component            |
| SW    | service water                               |
| SWGR  | switchgear                                  |
| TS    | technical specification                     |
| UFSAR | Updated Final Safety Analysis Report        |
| UT    | ultrasonic testing                          |
| VT    | visual testing                              |
| WO    | work order                                  |