



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

October 22, 2015

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

**SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 –  
INTEGRATED INSPECTION REPORT 05000272/2015003 AND  
05000311/2015003 AND INDEPENDENT SPENT FUEL STORAGE  
INSTALLATION (ISFSI) REPORT NO. 07200048/2015001**

Dear Mr. Braun:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Salem Nuclear Generating Station, Units 1 and 2. The enclosed report documents the inspection results, which were discussed on October 8, 2015, with Mr. Larry Wagner, Salem Plant Manager, and other members of your staff.

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

The inspectors documented three findings of very low safety significance (Green) in this report. All of these finding involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the non-cited violations in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Salem Nuclear Generating Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding, or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Salem Nuclear Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

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

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

Enclosure:  
Inspection Report 05000272/2015003  
and 05000311/2015003  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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Sincerely,

*/RA/*

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**U.S. NUCLEAR REGULATORY COMMISSION**

## REGION I

Docket Nos. 50-272 and 50-311

License Nos. DPR-70, DPR-75

Report Nos. 05000272/2015003 and 05000311/2015003

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, 2015 through September 30, 2015

Inspectors: P. Finney, Senior Resident Inspector  
A. Ziedonis, Resident Inspector  
S. Horvitz, Acting Resident Inspector  
S. Haney, Acting Senior Resident Inspector  
D. Lawyer, Health Physicist  
O. Masnyk Bailey, Health Physicist  
A. Siwy, Project Engineer  
T. Fish, Senior Operations Engineer  
N. Embert, Operations Engineer  
S. Barr, Senior Emergency Preparedness Inspector  
R. Barkley, Senior Project Engineer, PE

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

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## SUMMARY

Inspection Report (IR) 05000272/2015003, 05000311/2015003; 07/01/2015 – 09/30/2015; Salem Nuclear Generating Station Units 1 and 2; Maintenance Effectiveness; Operability Determinations and Functionality Assessments; Surveillance Testing.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified one NRC-identified and two self-revealing findings of very low safety significance (Green), all of which were non-cited violations (NCVs). 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 5, dated February 2014.

### Cornerstone: Mitigating Systems

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

This issue was more than minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone, and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, and screened to Green. Specifically, this finding was a design deficiency whereby the TDAFW pump did not maintain operability; however, this finding did not represent a loss of system or function, and TDAFW did not exceed its Technical Specification (TS) allowed outage time. The inspectors determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Resolution, because PSEG did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, PSEG did not complete corrective actions in a timely manner to resolve and correct excessive damper cycling, as identified in 2013; did not ensure that work order operation deferrals to address excessive cycling were minimized; and did not address the fundamental cause of excessive damper cycling while an interim corrective action was established to minimize excessive damper cycling. [P.3] (Section 1R12)

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when PSEG did not adequately implement procedure OP-AA-108-115, "Operability Determinations & Functionality Assessments." Specifically, PSEG did not properly evaluate and document an adequate basis for

operability of an AFW flow rate indicator prior to restoring it to an operable status. PSEG re-declared the channel inoperable, vented air from the transmitter, took satisfactory voltage readings prior to declaring the channel operable, and entered this issue in their CAP.

The issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, where it screened to Green since it did not affect the design or qualification of a mitigating structure, system, and component (SSC), did not represent a loss of system and/or function, and did not represent an actual loss of at least a single train for greater than its technical specification (TS) allowed outage time. The finding had a cross-cutting aspect in the area of Human Performance, Conservative Bias, in that licensee staff use decision making-practices that emphasize prudent choices over those that are simply allowable. Specifically, PSEG did not take a conservative approach to decision making, particularly when information was incomplete and conditions were unusual. Further, PSEG management did not take timely action to address degraded conditions commensurate with their safety significance. [H.14] (Section 1R15)

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

The issue was determined to be more than minor since it affected the equipment performance attribute of the Mitigating System cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, and screened to Green since it was not a qualification or design deficiency, did not represent a loss of system or function, and did not exceed its TS allowed outage time. The issue was determined to have a cross-cutting aspect in Human Performance, Design Margins, in that a licensee organization operates and maintains equipment within design margins, and places special attention on maintaining safety related equipment. Specifically, PSEG did not minimize a long-standing equipment issue nor carefully maintain its operating margin. [H.6] (Section 1R22)

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. The unit remained at or near 100 percent power for the remainder of the inspection period. On July 11, PSEG declared an Unusual Event, due to actuation of CO<sub>2</sub> fire protection suppression in the Unit 1 Emergency Diesel Generator Fuel Oil Transfer pump room. The Unit remained at full power during the event. On July 26, 2015, power was reduced to 25 percent power in support of reactor coolant loop flow transmitter replacement. Power was returned to 100 percent the following day. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On July 30, power was reduced to 70 percent in response to a blown fuse that resulted in a loss of three circulating water pumps. Full power was reached the following day. The reactor tripped on August 5 due to a loss of the 2H 4 kilovolt (kV) bus and its associated reactor coolant pump (RCP). A reactor startup was commenced on August 8 and full power was reached on August 14. 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**

#### 1R04 Equipment Alignment

##### Partial System Walkdowns (71111.04 – 4 samples)

##### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, Control Air system following rapid pressure decrease during maintenance activities on June 19
- Unit 1, Fuel Handling Building ventilation during irradiated fuel movements on August 27
- Unit 2, Auxiliary Building ventilation during Fukushima modification on August 27
- Common, Spent fuel pool (SFP) cooling during cross-tie of heat exchangers (HXs) on July 7

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), TSs, work orders, condition reports, 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 their CAP for resolution with the appropriate significance characterization.



b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 4 samples)

a. Inspection Scope

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

- Unit 1, 11 and 12 diesel fuel oil storage tank areas during CO<sub>2</sub> fire suppression system isolation and rate-of-rise detector failure on July 13
- Unit 2, 460V switchgear rooms and corridor on July 28
- Unit 2, Auxiliary Feedwater (AFW) pumps area on July 30
- Unit 2, Auxiliary building auxiliary equipment area on August 18

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes 2A, 2B, and SWI-1, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed. For those cables found submerged in water, the inspectors verified that PSEG had conducted an operability evaluation for the cables and were implementing appropriate corrective actions.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the Unit 1 SFP heat exchanger readiness and availability to perform its safety functions. The inspectors observed portions of the as-found inspection of the SFP heat exchanger. 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 heat exchanger tube wall thickness. The inspectors verified that PSEG initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 4, which included a failure of the Control Room air intake duct radiation monitor, main turbine lube oil leak, and a loss of offsite power. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed and reviewed the Unit 2 startup on August 8 for the Heater Drain Pump motor failure that resulted in a Unit 2 reactor trip on August 5. 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.

.3 Licensed Operator Requalification (71111.11B – 1 Sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10, and Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program."

Examination Results

Requalification exam results (operating test, only) for year 2015 were reviewed to determine if pass/fail rates were consistent with the guidance of IMC 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The review verified that the failure rate (individual or crew) did not exceed 20%.

- The overall individual failure rate was 2.9%.
- The crew failure rate was 0.0%

Written Examination Quality

The inspectors reviewed a sample of comprehensive written exams that facility staff previously administered to the operators in August and September 2014.

Operating Test Quality

The inspectors reviewed annual operating tests scenarios and job performance measures (JPMs) associated with two different examination weeks.

Licensee Administration of Operating Tests

The inspectors observed facility training staff administer dynamic simulator exams and JPMs September 8-14, 2015. These observations included facility evaluations of crew and individual operator performance during the simulator exams and individual performance of JPMs.

Exam Security

The inspectors assessed whether facility staff properly safeguarded exam material, and whether test item repetition was excessive.

Remedial Training and Re-examinations

The inspectors reviewed the remedial training package and the associated re-exam for an operator who failed the JPM portion of the 2015 annual operating test.

### Conformance with License Conditions

License reactivation and license proficiency records were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met. The inspectors also reviewed a sample of records for requalification training attendance, and a sample of medical examinations for compliance with license conditions and NRC regulations.

### Simulator Performance

Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was also reviewed to ensure facility staff addressed identified modeling problems.

### Problem Identification and Resolution

The inspectors reviewed recent operating history documentation found in inspection reports, licensee event reports, the licensee's CAP, NRC End-of-Cycle and Mid-Cycle reports, and the most recent NRC plant issues matrix. The resident staff was also consulted for insights regarding licensed operators' performance. The inspectors focused on events associated with operator errors that may have occurred due to possible training deficiencies.

#### b. Findings

No findings were identified.

### 1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

#### a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component 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 structure, system, or component 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 structures, systems, and components classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these structures, systems, and components 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, TDAFW enclosure room cooler inlet damper cycling on September 11
- Unit 2, Circulating water bus system following undervoltage (UV) trip on July 31

b. Findings

Introduction. A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified when PSEG selected a temperature control switch for the AFW pump area room cooler that was not suitable for its application. Specifically, the temperature control switch had an inadequate reset deadband that resulted in excessive cycling of the room cooler, failure of its associated turbine-driven AFW (TDAFW) pump enclosure inlet damper to fully open, and subsequent inoperability of the TDAFW pump.

Description. On March 26, 2015, a PSEG nuclear equipment operator (NEO) observed the Unit 1 TDAFW pump enclosure to be warm and humid. Subsequently, the NEO observed the inlet damper to the pump enclosure, 1ABS20, to be approximately 15% open with the AFW pump area room cooler in service. The AFW pump area room cooler is designed to provide cooling to the TDAFW pump enclosure through a series of automatic air-operated dampers: 1ABS2, 1ABS20 and 1ABS4. The 1ABS2 and 1ABS20 are normally closed dampers that are designed to fully open when the AFW pump area room cooler is in service. Per S1.OP-SO.SW-0005, "Service Water System Operability," Revision 39, Attachment 2, step 2.2, if the AFW room cooler is inoperable, then the TDAFW pump must be declared inoperable. On March 26, 2015, upon discovery of the 1ABS20 in a partially open condition with the AFW pump area room cooler in service, PSEG declared the TDAFW pump inoperable and entered Technical Specification 3.7.1.2.b, action a, which requires restoring the TDAFW pump to Operable within 72 hours, or be in Mode 3 within 6 hours and Mode 4 within the following 6 hours.

PSEG entered the issue into their CAP via notification 20682942. During an inspection of the 1ABS20 damper and its associated diaphragm-modulated operator (DMOP), PSEG maintenance technicians found an air leak blowing on the shaft of the damper actuator. The diaphragm was removed and visible punctures were discovered on the diaphragm. The inspectors observed maintenance activities in the field and independently verified the as-found conditions of the diaphragm. Maintenance technicians replaced the diaphragm and performed a satisfactory post-maintenance test on the 1ABS20, on March 26, 2015.

PSEG performed an apparent cause analysis (ACE) under 70175166 on the 1ABS20 damper failure, and determined that the apparent cause was "less than adequate verification of design inputs resulted in the incorrect selection of temperature control switches in Design Change Package (DCP) 80094618." Specifically, the DCP used an incorrect design input of 3°F for the temperature reset deadband (difference between trip and reset) without verifying the design basis deadband of 10°F contained in the PSEG instrument data card (ICD) associated with the AFW pump area room cooler temperature switch. The inspectors noted the DCP was created as an action to resolve a temperature switch design deficiency identified in ACE 70071998, which was performed in response to a 2007 failure of damper 1ABS20 that was also attributed to excessive cycling. The inspectors concluded that the apparent cause determination in the 2015 ACE was appropriate, because the inspectors verified that the DCP used an incorrect design input during selection of the temperature switches. Additionally, the inspectors concluded that the DCP did not effectively resolve the temperature switch design deficiency identified by PSEG in the 2007 ACE.

Following installation of the DCP in 2012, the inspectors identified an additional example where PSEG did not effectively resolve an issue with the TDAFW pump room cooler temperature switch in a timely manner. On October 2, 2013, the inspectors identified excessive cycling of the TDAFW pump room cooler and associated dampers, which PSEG captured under notification 20623371. The inspectors noted that PSEG did implement an interim corrective action to run the room cooler in manual mode, with river temperatures above 60°F, to prevent cycling the dampers during warmer. On October 15, 2013, PSEG created order 70159450, operation 10, for engineering to review the temperature switch design with a due date of November 13, 2013. The inspectors noted that PSEG engineering extended the due date seven times prior to the 1ABS20 damper failure on March 26, 2015. Therefore, the inspectors concluded that ineffective and untimely resolution of the AFW pump room cooler temperature switch issue was a contributing factor that led to excessive damper cycling and eventual failure.

Analysis. The inspectors determined that PSEG's selection of a temperature control switch that was not suitable for its application was within PSEG's ability to foresee and correct, and should have been prevented, and was therefore a performance deficiency. This issue was more than minor because it was associated with the equipment performance attribute of the Mitigating System cornerstone, and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, PSEG replaced the TDAFW room cooler temperature control switch without verifying the appropriate temperature deadband design basis input. This led to excessive cycling, and subsequent failure, of the room cooler inlet damper, which rendered the TDAFW pump inoperable. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, and screened to Green. Specifically, this finding was a design deficiency whereby the TDAFW pump did not maintain operability; however, this finding did not represent a loss of system or function, and TDAFW did not exceed its TS allowed outage time.

The inspectors determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Resolution, because PSEG did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, PSEG did not complete corrective actions in a timely manner to resolve and correct excessive damper cycling, as identified in 2013, did not ensure that work order operation deferrals to address excessive cycling were minimized, and did not address the fundamental cause of excessive damper cycling while an interim corrective action was established to minimize excessive damper cycling. [P.3]

Enforcement. 10 CFR 50, Appendix B, Criterion III states, in part, that "Measures shall ...be established for the selection and review for suitability of application of materials, parts, equipment and process that are essential to the safety-related functions of the structures, systems and components." Contrary to the above, PSEG did not establish measures for the selection and review for suitability of application of equipment that was essential to the safety-related function of the TDAFW pump. Specifically, PSEG installed a TDAFW pump room cooler temperature switch, on July 25, 2012, with a temperature reset deadband that was not reviewed for suitability of application in the TDAFW pump enclosure space. Consequently, the room cooler inlet damper cycled excessively until it failed to fully open on March 26, 2015, which resulted in TDAFW pump inoperability. PSEG entered this issue into their CAP under notification

20682942, performed immediate repairs to the failed damper, performed an ACE, and created corrective actions to replace the temperature switches on both units. Because this violation was of very low safety significance (Green) and was entered in PSEG's CAP, it is being treated as an NCV in accordance with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000272/2015003-01; Failure to Establish Measures for the Selection and Review for Suitability of a TDAFW Room Cooler Temperature Switch)**

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, Planned yellow risk condition for SFP HX eddy current testing on July 7
- Unit 1, Unplanned yellow risk condition for 1B emergency diesel generator (EDG) output breaker failure to close on September 2
- Unit 2, 21 chiller trip on freeze protection on August 14
- Unit 2, Planned yellow risk condition for alternate AFW supply while installing Fukushima modifications on August 18
- Unit 2, 22 chiller removed from service for high suction pressure and low delta-temperature on September 10
- Common, Planned yellow risk condition for control area ventilation damper maintenance on September 22

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- Unit 1, 13 RCP flow channel I spiking on July 7
- Unit 1, Pressurizer power-operated relief valve (PORV) control circuit indicator 10 CFR 21 on September 2
- Unit 2, 2A Safeguards Equipment Control trouble alarm on August 5
- Unit 2, Steam generator PORV isolation at power on August 11
- Unit 2, 23 and 24 AFW flow rate indications while the pumps were secured on August 12
- Unit 2, AFW discharge check valve leakby on August 18
- Common, Containment fan cooling unit relay manufacturing defect on July 9

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

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," when PSEG did not adequately implement procedure OP-AA-108-115, "Operability Determinations and Functionality Assessments," Revision 4. Specifically, PSEG did not properly evaluate and document an adequate basis for operability of an AFW flow rate indicator prior to restoring it to an operable status.

Description. On August 8, 2015, a Unit 2 reactor startup was in progress. When the 22 steam generator (SG) feedwater pump was available, operators transferred feed to the SGs from AFW to main feedwater. Subsequently, the operators stopped the 21 and 22 AFW pumps in preparation for placing the system into the standby alignment. Concurrently, the 24 AFW flow rate meter indicated  $2.2 \times 10^4$  lbm/hr with the AFW system out of service and the associated SG level control valve, 24AF21, closed. Operators declared the 24 AFW flow rate indicator inoperable, entered the issue in their CAP as notification 20699200, and entered TS 3.3.3.7 action 4, which states that with only one AFW flow rate indication inoperable, operations may proceed if an operable SG wide range level channel is available as an alternate means of indication for the SG with an inoperable AFW flow rate channel. Three hours later, the flow rate indication unexpectedly returned to 0.0 lbm/hr with no work performed and remained at 0.0 lbm/hr for 3.5 days.

While reviewing control room logs on August 12, 2015, in accordance with daily plant status activities, the inspectors noticed that the 24 AFW flow rate indicator had been declared operable the previous evening. The logs stated that the indicator was declared operable following satisfactory channel checks and the TS was exited. During a subsequent tour of the control room, the inspectors questioned operators on what work had been performed to return the instrument to an operable condition, what prevented the instrument from repeating the condition during a transient or downpower, and,



ultimately, what was PSEG's basis for operability. Shortly thereafter, operators declared the 24 AFW flow rate indicator inoperable from the time of the original inoperability on August 8, 2015 and entered this in their CAP as notification 20699415. Four minutes later, operators identified the 23 AFW flow rate indication was reading erratically between 0 and  $0.7 \times 10^4$  lbm/hr with AFW secured and its SG level control valve, 23AF21, closed. Operators declared the 23 AFW flow rate indicator inoperable, entered this into their CAP as notification 20699402, and entered TS 3.3.3.7 actions 4 and 6, which required PSEG to restore an inoperable channel to operable status within 7 days, or be in hot shutdown within the next 12 hours. As corrective maintenance, PSEG technicians vented the 24 AFW flow rate indicator and discovered the presence of air in the system. Subsequent instrument voltage readings were satisfactory and the channel was returned to an operable status. PSEG also performed a sensor calibration and a channel calibration to resolve the 23 AFW flow rate indicator issue.

OP-AA-108-115, step 4.6.1 states, in part, that "operability determinations should be documented in sufficient detail to allow an individual knowledgeable in the technical discipline associated with the condition to understand the basis for the determination. Adequate documentation is necessary to establish a basis to allow for subsequent independent reviews." In addition, step 4.7.9 directs the Operations Shift Manager to document operability determination results on the notification in accordance with the CAP procedure. Step 4.7.9 also states that, "the results of the Immediate Determination of Operability and the basis for operability need to be documented once the declaration of immediate operability is made." Finally, step 4.13.1 states that "corrective actions taken to restore full qualification should be addressed through the CAP." The inspectors determined that PSEG had not documented an adequate basis for a reasonable expectation of operability.

Analysis. The inspectors determined that the inadequate implementation of procedure OP-AA-108-115 was a performance deficiency within PSEG's ability to foresee and correct and should have been prevented. The issue was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the instrument was incorrectly declared operable and PSEG had not followed procedures when evaluating and documenting operability. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, where it screened to Green since it did not affect the design or qualification of a mitigating SSC, did not represent a loss of system and/or function, and did not represent an actual loss of at least a single train for greater than its TS allowed outage time.

The finding had a cross-cutting aspect in the area of Human Performance, Conservative Bias, in that licensee staff use decision making-practices that emphasize prudent choices over those that are simply allowable. Specifically, PSEG did not take a conservative approach to decision making, particularly when information was incomplete and conditions were unusual. Further, PSEG management did not take timely action to address degraded conditions commensurate with their safety significance. [H.14]

Enforcement. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions,

procedures, or drawings.” Procedure OP-AA-108-115 requires the basis for operability to be documented once the declaration of immediate operability is made. Contrary to the above, on August 11, 2015, PSEG’s immediate determination of operability did not properly evaluate and document an adequate basis for operability of the 24 AFW flow rate indicator, which resulted in an incorrect operability assessment. In response, on August 12, 2015, PSEG re-declared the channel inoperable, vented air from the transmitter, took satisfactory voltage readings prior to declaring the channel operable, and entered this issue in their CAP (20699415). Because this finding was of very low safety significance (Green) and PSEG entered this into their CAP, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000311/2015003-02, Inadequate Operability Determination of Auxiliary Feedwater Flow Rate Indicator)**

1R18 Plant Modifications (71111.18 – 3 samples)

.1 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 1, Temporary setpoint change associated with 13 reactor coolant loop channel I flow instrument on July 27
- Unit 1, Temporary damper modification for Fuel Handling Building ventilation on August 25

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

On September 17, the inspectors evaluated polyacrylic acid (PAA) injection into main feedwater on Units 1 and 2 following its effect on main steam flow indications. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors walked down portions of the system piping and components, and interviewed chemistry and engineering personnel to understand anticipated effects, internal and external operating experience, and its impact on TS-related instrumentation.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 5 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 points were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Unit 1, 13 reactor coolant loop channel I flow transmitter following replacement for spiking on July 27
- Unit 1, 11 AFW pump following scheduled maintenance on July 28
- Unit 1, Liquid effluent flow recorder following an indication failure on August 17
- Unit 1, 1B EDG output breaker following a failure to close on September 4
- Unit 2, 21 chiller following a trip on freeze protection on August 20

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 forced outage, which was conducted during the dates below. 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 Mode 3 operations in Hot Standby, the reactor startup, and the power ascension and monitored controls associated with the following outage activities:

- Unit 2, loss of 2H 4kV group bus and reactor trip on August 5 through August 8

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, 1B EDG monthly surveillance on August 3
- Unit 1, Chiller performance operational testing on September 8
- Unit 1, 1C EDG monthly surveillance following SR 4.0.3 entry on September 9
- Unit 2, Containment airlocks primary containment isolation valve (PCIV) surveillance on August 11
- Unit 2, Component cooling water valve stroke surveillance following suction valve, 2CC17, control power failure on September 10

b. Findings

Introduction. A self-revealing, Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified when the 13 chiller tripped on freeze protection due to insufficient refrigerant. Specifically, timely corrective actions were not implemented in response to repetitive Freon leaks that ultimately rendered the 13 chiller inoperable.

Description. On April 16, 2015, while performing post-maintenance activities to restore the 12 chiller to an operable status, the 13 chiller tripped on freeze protection resulting in an unplanned 72-hour Limiting Condition of Operation (LCO) via TS 3.7.10.a due to two inoperable chillers. The 12 chiller was returned to an operable status approximately seven hours later that changed the LCO to a 14-day action statement. In response, PSEG initiated a prompt investigation, conducted troubleshooting and repairs, entered the issue in their CAP (notifications 20685625 and 20686879), and completed an ACE. Troubleshooting determined there had been a large Freon leak on the chiller condenser relief valve, 13CH417, and maintenance staff replaced the valve. When PSEG evacuated the machine, there were 50 pounds of refrigerant remaining versus an expected 130 pounds. The 13 chiller was returned to an operable status on April 20, 2015.

In January 2008, under notification 20350594, a request was made to identify an equivalent replacement CH417 valve since "the chiller condenser relief valves, CH417s, have a history of leaking refrigerant past the seat." An action item, to find a suitable replacement, concluded that while an identified replacement had a similar design and construction, there was "no conclusive... improvements by changing... recommend that the existing Henry valve be retained."

In September 2011, the 13CH417 leaked by causing 13 chiller inoperability. This was documented in notifications 20525822 and 20527152 with an associated ACE completed under 70128879. This ACE documented that the relief valve's setpoint is 300 psig and that normal chiller pressure is 210 psig. In the case of the 2011 failure, the identified leak started at 198 psig and became a mild leak at 240 psig. When the chiller starts from a warm condition, a peak pressure of 220 psig is reached and when starting from ambient temperature, a peak pressure of 235 psig is reached based on testing. In the ACE's extent of condition review, PSEG cited many instances of the relief valves having small leaks at normal operating pressure.

In February 2012, PSEG's plant health committee approved a design change stemming from notification 20350594 and ACE 70128879 that would add a rupture disk upstream of the relief valve to eliminate refrigerant leakage. PSEG added this item to their long term asset management program as S12-0002, which categorized the issue as chronic.

In August 2012, work order 60103894 replaced the 13CH417 again. The work order instructions included a note that one "cannot rebuild these valves, we do a leak test only on the old valve because if you lift them, the seats will be damaged and leak."

On March 9, 2015, under work order 30278563, a periodic leak check was performed on the 13 chiller. Identified leaks included the 13CH417 and notification 20681075 was written to document those leaks discovered. This notification was allocated to corrective maintenance work order 60116599 that was completed during the following nine days and included refrigerant leak repairs and refrigerant replacement. Despite identified 13CH417 leakage being allocated to the associated work order, there was no documentation that the leak was addressed nor was the relief valve replaced. The 13 chiller became inoperable the following month. From December 2010 to April 2015, 13CH417 had been replaced three times.

PSEG's 2015 prompt investigation and ACE determined that despite a poor reliability history, the eight-year replacement frequency for these relief valves was not reduced. Additionally, prior relief valve leaks and the need to replace the valve when a leak was identified was previously addressed in a previous ACE (70128879). Finally, PSEG had approved a design change to install rupture discs over three years prior to the current failure that had not yet been implemented. Overall, inspectors determined that chiller condenser relief valve leakage was a known, repeat condition that was adverse to quality and had not been corrected in a timely manner.

Analysis. Failure to correct a condition adverse to quality in a timely manner was a performance deficiency. The issue was determined to be more than minor since it affected the equipment performance attribute of the Mitigating System cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a repeat condition adverse to quality ultimately resulted in inoperability of a chiller. The finding was evaluated in accordance with IMC 0609, Attachment 4 and Appendix A, Exhibit 2, and screened to Green since it was not a qualification or design deficiency, did not represent a loss of system or function, and did not exceed its TS allowed outage time.

The issue was determined to have a cross-cutting aspect in Human Performance, Design Margins, in that a licensee organization operates and maintains equipment within design margins, and places special attention on maintaining safety-related equipment. Specifically, PSEG did not minimize a long-standing equipment issue nor carefully maintain its operating margin. [H.6]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, states, in part, that "measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, ... are promptly identified and corrected." Contrary to this, from January 2008 to April 2015, PSEG did not correct chronic chiller relief valve Freon leaks in a timely manner. In response, PSEG initiated a prompt investigation, conducted

troubleshooting and repairs, entered the issue in their CAP (notifications 20685625 and 20686879), and completed an ACE. Because the issue was of very low safety significance (Green) and was entered in PSEG's CAP, the finding is being treated as an NCV in accordance with section 2.3.2 of the Enforcement Policy. **(05000272/2015003-03, Failure to Correct Chronic Chiller Relief Valve Freon Leaks)**

### **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 of the Artificial Island siren testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency (FEMA) approved ANS Design Report to ensure PSEG's compliance with design report commitments for system maintenance and testing. The inspection was conducted in accordance with NRC Inspection Procedure 71114.02. 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 Nuclear Generating Station 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 Facility (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 reports; the most recent drive-in drill reports; and corrective action 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. The inspection was conducted in accordance with NRC Inspection Procedure 71114.03. 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 (71114.05 – 1 Sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of PSEG's efforts to maintain the Salem Nuclear Generating Station Emergency Preparedness (EP) programs. The inspectors reviewed: memorandums of agreement with offsite agencies; the 10 CFR 50.54(q) Emergency Plan change process and practice; PSEG's maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary, backup, and alternative ERF maintenance. The inspectors also verified PSEG's compliance at Salem Nuclear Generating Station with NRC EP regulations regarding: emergency action levels for hostile action events; protective actions for on-site personnel during events; emergency declaration timeliness; ERO augmentation and alternate facility capability; evacuation time estimate updates; on-shift ERO staffing analysis; and, ANS back-up means.

The inspectors further evaluated PSEG's ability to maintain the Salem Nuclear Generating Station EP programs through their identification and correction of EP weaknesses, by reviewing a sample of drill reports, self-assessments, and 10 CFR 50.54(t) reviews. Also, the inspectors reviewed a sample of EP-related condition reports initiated at Salem Nuclear Generating Station from January 2014 through June 2015. The inspection was conducted in accordance with NRC Inspection Procedure 71114.05. 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.

**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 for the following systems for the period of July 1, 2014, through June 30, 2015.

- Units 1 and 2, Heat Removal System (MS08)
- Units 1 and 2, RHR System (MS09)

To determine the accuracy of the performance indicator (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's operator narrative logs, condition reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 EP 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 2014. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the second calendar quarter of 2014 through the second calendar quarter of 2015 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.

40A2 Problem Identification and Resolution (71152)

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, 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.

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

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 Parts 50.72 and 50.73. The inspectors reviewed PSEG's follow-up actions related to the events to assure that PSEG implemented appropriate corrective actions commensurate with their safety significance.

- Unit 1, Unusual Event declared due to CO<sub>2</sub> fire protection suppression actuation (EN 51222) on July 11
- Unit 2, Loss of 2H 4kV group bus and reactor trip on August 5

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Institute of Nuclear Power Operations Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO accreditation team evaluation of the maintenance and engineering technical training programs conducted in February 2013. The inspectors evaluated this report to ensure that NRC perspectives of PSEG performance were consistent with any issues identified during the assessment. The inspectors also reviewed this report to determine whether INPO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

.2 Operation of an Independent Spent Fuel Storage Installation (ISFSI) at Operating Plants (60855 and 60855.1)

a. Inspection Scope

From July 27 through August 3, 2015, the inspectors observed and evaluated the PSEG's loading of a multi-purpose canister (MPC) – 313, the first of six canisters loaded during the PSEG's ISFSI dry cask campaign. The inspectors also reviewed PSEG's activities related to long-term operation and monitoring of their ISFSI. The inspectors verified compliance with the Certificate of Compliance (CoC), TS, regulations, and PSEG procedures.

The inspectors observed the loading of spent fuel assemblies into the MPC and the MPC/HI-TRAC being moved from the cask pit to the cask wash down area. Inspectors also observed other cask processing operations including: welding of the lid to the MPC, non-destructive examination of the lid weld, forced helium dehydration of the MPC, preparations for transport, installation of the HI-Storm lid, and transport to the ISFSI pad.

During performance of these activities, the inspectors verified that procedure use, communication, and coordination of ISFSI activities met established standards and requirements. The inspectors attended PSEG briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors. The inspectors reviewed loading, monitoring and helium leak testing procedures and evaluated PSEG's adherence to these procedures. The inspectors also reviewed the training of personnel assigned to ISFSI activities.

The inspectors reviewed PSEG's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages to verify that PSEG was loading fuel in accordance with the CoC and TS. The inspectors confirmed that the PSEG did not plan to load any damaged fuel assemblies during this campaign.

The inspectors reviewed radiation protection procedures and radiation work permits associated with the ISFSI loading campaign. The inspectors also reviewed the As-Low-As-Reasonably-Achievable (ALARA) goal for the cask loading to determine the adequacy of PSEG's radiological controls and to ensure that radiation worker doses were ALARA, and that project dose goals could be achieved. The inspectors reviewed radiological survey records from the current loading campaign to confirm that dose levels on the HI-TRAC surface were as expected.

The inspectors performed tours of the heavy haul path and ISFSI pad to assess the material condition of the path, pad, and the loaded HI-STORM. The inspectors also verified that transient combustibles were not being stored on the haul path, ISFSI pad, or in the vicinity of the HI-STORM overpacks. The inspectors checked the daily logs in the Salem Nuclear Generating Station control room and verified PSEG was appropriately performing daily HI-STORM vent surveillances in accordance with TS requirements.

The annual environmental reports were reviewed to verify that areas around the ISFSI site boundary were within limits specified in 10 CFR 20 and 10 CFR 72.104. The inspectors reviewed PSEG's 10 CFR 72.48 screenings to verify that PSEG had appropriately considered the conditions under which they made changes without prior NRC approval. The inspectors reviewed revisions to the 10 CFR 72.212 report. The inspectors also reviewed CAP notifications, audit reports, and self-assessments that were generated since PSEG's last loading campaign to ensure that issues were being properly identified, prioritized, and evaluated commensurate with their safety significance.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 8, 2015, the inspectors presented the inspection results to Mr. Larry Wagner, 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.

**SUPPLEMENTARY INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

J. Perry, Site Vice President  
L. Wagner, Plant Manager, Salem  
C. Aung, Principle Nuclear Engineer  
M. Baca, Dosimetry Supervisor  
H. Balian, Engineer  
C. Barnes, DSC Task Manager  
B. Brown, Equipment Operator  
D. Burgin, Emergency Preparedness Corporate Functional Area Manager  
K. Caampued, System Engineer/Plant Engineering, Salem  
P. Duke, Corporate Licensing Manager  
G. Gauding, Exam Author  
A. Hess, Fuels Engineer  
A. Irizarry, ALARA Specialist  
A. Johns, Radiation Protection Supervisor  
P. Martitz, Radiation Protection Support Superintendent  
T. McLaughlin, Reactor Services Superintendent  
T. Sexsmith, Salem Regulatory Assurance Compliance Engineer  
J. Shelton, Work Week Manager, Salem  
G. Swartz, Principal Nuclear Engineer  
T. Wathey, Reactor Engineering Manager  
R. White, Salem Operations Training Manager  
P. Williams, LOR Lead  
D. Zakarian, Outage Services Technical Specialist

HOLTEC

P. Macconi, Site Project Manager

PCI Services

J. Beard  
J. Federoff  
S. Hutchison  
D. Minchew  
S. Smith

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Open and Closed

05000272/2015003-01	NCV	Failure to Establish Measures for the Selection and Review for Suitability of a TDAFW Room Cooler Temperature Switch (Section 1R12)
05000311/2015003-02	NCV	Inadequate Operability Determination of Auxiliary Feedwater Flow Rate Indicator (Section 1R15)
05000272/2015003-03	NCV	Failure to Correct Chronic Chiller Relief Valve Freon Leaks (Section 1R22)

## LIST OF DOCUMENTS REVIEWED

\* Indicates NRC-identified

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

#### Procedures

S1.OP-SO.FHV-0001, Fuel Handling Building Ventilation Operation, Revision 13  
 S1.OP-SO.SF-0002, Spent Fuel Cooling System Operation, Revision 21  
 SC.OP-SO.SA-0002, Temporary Station Air Compressor Operation, Revision 22

#### Notifications

20694198	20694203	20694204	20694205	20694262	20694433
20695121	20695221	20695238	20695239	20695333	20695564
20695682	20695804	20695805	20695827	20696018	20696328
20696460	20696493	20696942	20701143*		

#### Drawings

205233, No. 1 Unit Spent Fuel Cooling, Revision 29  
 205321, No. 1 Unit - Auxiliary Building Diesel Generator & Fuel Handling Area Ventilation, Sheet 1, Revision 23  
 205333, No. 2 Unit Spent Fuel Cooling, Revision 26

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

#### Procedures

FP-AA-015, Compensatory Measure Firewatch Program, Revision 6  
 FP-SA-003, Actions for Inoperable Fire Protection – Salem Station, Revision 1  
 FP-SA-003, Actions for Inoperable Fire Protection – Salem Station, Revision 4  
 FP-SA-2511, Salem Pre-Fire Plan U/2 Reactor Plant Auxiliary Equipment Area, Revision 0  
 FP-SA-2541, Pre-Fire Plan U/2 460V Switchgear Rooms & Corridor, Revision 0  
 FP-SA-2543, Pre-Fire Plan U/2 AFW Pumps Area, Revision 0

NC.DE-PS.ZZ-0001-A6-GEN, Salem Fire Protection Report - General, Revision 2  
S2.FP-ST.FBR-0028, Class 1 Fire Damper Operability Test, Revision 6  
SH.FP-EO.ZZ-0002, Fire Department Fire Response, Revision 4

Notifications

20699804 20700136 20701747\* 20701748\* 20702205\*

Maintenance Orders/Work Orders

30265720 60125347

Drawings

205337, No. 2 Unit Auxiliary Building - Ventilation, Sheet 3, Revision 26  
605810, Units 1 & 2 Combustible Control Zones Auxiliary Bldg. EI 45' & EI 55', Revision 0  
605818, No. 1 & 2 Unit Auxiliary Bldg. Boundary Locations Floor Plan EI 45'-0" & EI 55',  
Revision 0

**Section 1R06: Flood Protection Measures**

Notifications

20699564 20700908\* 20700911\*

Maintenance Orders/Work Orders

30271412 30274418

**Section 1R07: Heat Sink Performance**

Procedures

SC.MD-PM.SF-0002, Spent Fuel Cooling Heat Exchanger Inspection and Repair, Revision 5

Notifications

20695965 20695966 20696064

Maintenance Orders/Work Orders

30097691 30142976

Other Documents

S-C-SF-MDC-1240, SFP Thermal-Hydraulic Calculation, Revision 1

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

Procedures

ANSI/ANS-3.4-1983, Medical Certification and Monitoring of Personnel Requiring Operator  
Licenses for Nuclear Power Plants.

ANSI/ANS-3.5-2009, Nuclear Power Plant Simulators for Use in Operator Training  
and Examination

S2.OP-IO.ZZ-0003(Q), Hot Standby to Minimum Load, Revision 40

2015 LOR Annual Operating Exam Sample Plan

Notifications

20699433

Job Performance Measures

2015 Annual IP-9	2015 Annual IP-10	2015 Annual S-9	2015 Annual S-12
2015 Annual S-10	2015 Annual IP-7	2015 Annual IP-8	2015 Annual S-11
2015 Annual RO Admin 3	2015 Annual SRO Admin 3		

Comprehensive Written Exams (Previously administered in 2014)

Written Exam 53567321

Written Exam 53595570

Written Exam 53610645

Simulator Scenarios

ESG-1512    ESG-1513    ESG-1514

ESG-1516    ESG-1517    ESG-1518

Simulator Testing

Cycle 21 App. B Testing Documentation

Cycle 21 Core Model Testing Documentation

Salem Simulator Differences List

Transient Testing Documentation

Condition Reports

20660673    20664951    20685541    20687679    20688776    20688777

20694465    20695292    20699747    20699774    20699908

Other Documents

Scenario ESG-1507

**Section 1R12: Maintenance Effectiveness**Notifications

20588228    20697660\*    20698252    20699441    20700881\*    20702720\*

20702849\*    20702964\*    20703037\*    20634268    20638971    20702788

20623371\*    20682942    20684098    20683706    20693509    20693665

20690341    20682942

Maintenance Orders/Work Orders

70071998    70147771    70159450    70175166    70175166    70175193

70179132    80094618    80104982

Drawings

602940, 4160V Circulating Water Buses, Revision 6

602958, Bus Section Nos. 23 &amp; 24 Undervoltage Protection, Sheet 1, Revision 3

602958, Bus Section Nos. 23 &amp; 24 Undervoltage Protection, Sheet 2, Revision 0

604003, 2SWG2CWD Bus Section No.23 Bus Potential, Revision 1

Other Documents

ACM 13-019, Biofouling of 1 AFW Pump Room Cooler, S1SW -1SWE17

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

ER-AA-600-1023, ORAM and EOOS Model Capability, Revision 7  
 FP-AA-011, Control of Transient Combustible Material, Revision 4  
 OP-AA-108-116, Protected Equipment Program, Revision 10  
 S1.OP-AB.SF-0001, Loss of Spent Fuel Cooling, Revision 12  
 S2.OP-CH.ST-0004, Chilled Water System – Chillers, Revision 18  
 SC.ER-PS.FP-0001-A4, Fire Events in Maintenance Rule (a)(4) Risk Evaluations, Revision 0  
 SC.FP-SV.ZZ-0058, Inspection of Class 1 Fire Doors and Safety Related Areas for Transient Combustibles, Revision 22

Notifications

20693579	20695526	20698875	20699550	20699773	20699984*
20699992	20700017	20700225*	20700586*	20701774	20701913
20702487	20702600	20702744	20702903*		

Maintenance Orders/Work Orders

30121261	60122062
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Other Documents

Salem Unit 1 Risk Assessment for Work Week 528 – July 5, 2015, through July 11, 2015, Revision 0  
 Salem Unit 2 Risk Assessment for Work Week 528 – July 5, 2015, through July 11, 2015, Revision 0  
 Salem Unit 1 Risk Assessment for Work Week 534 – August 16, 2015, through August 22, 2015, Revision 2  
 Salem Unit 2 Risk Assessment for Work Week 534 – August 16, 2015, through August 22, 2015, Revision 3

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

OP-AA-108-115, Operability Determinations & Functionality Assessments, Revision 4  
 S2.IC-CC.AF-0218, 2FA1095 #23 Steam Generator Auxiliary Feedwater Flow, Revision 13  
 S2.IC-SC.AF-0218, 2FA-1095 #23 Steam Generator Auxiliary Feedwater Flow, Revision 8  
 S2.OP-AR-ZZ-0001, Overhead Annunciators – Window A (A-29), Revision 56  
 S2.OP-IO.ZZ-0102, Cold Shutdown to Hot Standby Administrative Requirements, Revision 11  
 S2.OP-ST.INST-0002, Accident Monitoring Instrumentation Auxiliary Feedwater Flow Rate  
 SC.MD-CM.SEC-0001, Safeguard Equipment Control Troubleshooting, Revision 14  
 S2.IC-DC.AF-0002, 2TA-16555I Aux Feedwater Local Temperature Indicator, Revision 5

Notifications

20190252	20390498	20509040	20609444	20610738	20659036
20659178	20660277	20697556*	20698488	20698616	20698617
20699119	20699200	20699218	20699287	20699402	20699415*
20699658	20699660	20700006	20700207*	20703033*	

Maintenance Orders/Work Orders

60096652	60125196	60125197	70154610	70168574
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Miscellaneous

S-C-F400-MFD-0321, Aux Feedwater System Backleakage, Revision 2  
UFSAR Section 10.4.4

Drawings

218871, Unit 2 CVCS No. 21 Primary Water Make-up Pump Schematic Control, Sheet 1,  
Revision 7  
236256, Unit 2 No. 2A, 2B & 2C Vital Buses Safeguard Equipment Control System, Sheet 2,  
Revision 10  
236259, Unit 2 No. 2A, 2B & 2C Vital Buses Safeguard Equipment Control System, Sheet 2,  
Revision 8

Other Documents

70179064, Technical Evaluation of 2A SEC Loss of Voltage/Trouble Alarm  
70179388, Operability Evaluation –Suspect 23/24AF23 Leaking By

**Section 1R18: Plant Modifications**

Procedures

LS-AA-104-1000, 50.59 Resource Manual, Revision 8  
S1.OP-DL.ZZ-0003, Control Room Log – Modes 1-4, Revision 76  
S1.RA-ST.FHV-0001, Fuel Handling Building Exhaust Ventilation System Surveillance Test,  
Revision 6

Drawings

205201, Reactor Coolant, Sheet 2, Revision 39  
205237, No. 1 Unit Auxiliary Building – Ventilation, Sheet 1, Revision 47  
205321, No.1 Unit - Auxiliary Building Diesel Generator & Fuel Handling Area Ventilation,  
Sheet 1, Revision 23

Notifications

20668334	20682977	20682977	20692142	20695795	20696512
20696512	20696678	20696737	20698771		

Maintenance Orders/Work Orders

30288463	60122681	60124522	60124542	80110854
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Design Change

80114756, 13 RC Flow Loop 3 Channel 1 Setpoint Change, Revision 0

Other Documents

50.59 Screening S2015-195, Unit 1 Fuel Handling Building Ventilation Differential Pressure,  
Revision 0  
70178582, Operability Evaluation of Fuel Handling Area Ventilation System  
DCRMS ACN#: P0C091510002, Rec. Trans.# DES150331  
DCRMS ACN#: TGC091715001, Rec. Trans.# DES150333  
S2015-142, 50.59 Review for DCR 80110854, Polyacrylic Acid (PAA) Injection to Feedwater  
TCCP 1ST15-012, Unit 1 Fuel Handling Building Ventilation Differential Pressure, Revision 0



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

MA-AA-716-012, Post Maintenance Testing, Revision 20  
 S1.OP-ST.AF-0001, Inservice Testing - 11 Auxilliary Feedwater Pump, Revision 17  
 S1.OP-SO.WL-0002, Release of Radioactive Liquid Waste from 12 CVCS Monitor Tank, Revision 27, completed 8/15/15  
 S1.OP-SO.WL-0001, Release of Radioactive Liquid Waste from 11 CVCS Monitor Tank, Revision 25, completed 8/16/15  
 S2.OP-ST.DG-0005, 22 Fuel Oil Transfer System Operability Test, Revision 26  
 S2.OP-ST.CH-0004, Chilled Water System – Chillers, Revision 18  
 SC.MD-PM.AF-0001, Motor Driven Byron-Jackson AFW Pump Disassembly, Inspection, and Reassembly, Revision 6  
 MA-AA-716-004, Conduct of Troubleshooting, Revision 12

Notifications

20690851	20691745	20697953	20697984	20698892*	20699773
20699800	20701570	20701933	20683137	20701570	

Maintenance Orders/Work Orders

30209382	50176120	50176479	50176525	50178083	60119265
60119937	60120048	60121850	60123802	60124129	60125261
60125339	70163272	70176973	70178758		

Drawings

223825, No 1 & 2 Units – No 1A & 2A Diesel Generator 230V Vital Control Center, Revision 18

Other Documents

MA-AA-716-004, Attachment 4: Troubleshooting Control Form, Revision 12, 1B EDG 4kV Breaker, dated 09/01-02/2015

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

20698515	20698516	20698517	20698519	20698719	20698934
20698935	20698937	20698944	20698949	20698977	20699022
20699024	20699026				

**Section 1R22: Surveillance Testing**Procedures

S1.OP-ST.CH-0004, Chilled Water System – Chillers, Revision 12  
 S1.OP-ST.DG-0002, 1B Diesel Generator Surveillance Test, Revision 47  
 S2.OP-LR.CAN-0002, 130' Elevation Containment Airlock Leakrate, Revision 5  
 S2.OP-LR.CAN-0004, 100' Elevation Containment Airlock Leakrate, Revision 4  
 S2.OP-ST.CC-0004, Inservice Testing Component Cooling Valves, Revision 15

Notifications

20503939	20506995	20522639	20685621	20685625	20685996
20700149*	20700152*	20700153*	20700154*	20702113	20702334
20702121					

Maintenance Orders/Work Orders

50176754 50178115 60098859 60125125 60125606

Evaluations

60125559 70123080 70128879 70176784

Drawings

601685, No 2 Unit - Component Cooling System Inlet &amp; Outlet Valves, Revision 8

Other DocumentsS1.OP-PT.DG-0001, Diesel Generator Unloaded Functional Test, Revision 7, completed  
09/08/2015S1.OP-ST.DG-0003, 1C Diesel Generator Surveillance Test, Revision 49, completed  
09/08/2015**Section 1EP2: Alert and Notification System Evaluation**Procedures

EP-AA-121-1002, PSEG ANS Program, Revision 1

EP-AA-121-1004, PSEG ANS Corrective Maintenance, Revision 1

EP-AA-121-1005, PSEG ANS Preventive Maintenance, Revision 2

EP-AA-121-1006, PSEG ANS Siren Monitoring, Troubleshooting, and Testing, Revision 1

Other Documents

ANS maintenance records, January 2014 – June 2015

ANS test records, January 2014 – June 2015

Final REP-10 Design Review Report, PSEG Salem and Hope Creek Generating Stations,  
American Signal Corporation, dated 1/6/2006Letter from FEMA Region II to NJ OEM, REP Unit, Status of Provisions for Back-up Alert and  
Notification for the Salem Hope Creek Nuclear Power Station Emergency Planning  
Zone, dated 12/6/2012Letter from FEMA Region III to Delaware Emergency Management Agency, Status of Provisions  
for Back-up Alert and Notification for the Salem Hope Creek Nuclear Power Station  
Emergency Planning Zone, dated 11/28/2012Letter from PSEG Nuclear LLC to NJ RERP & Technical Unit Emergency Response,  
Incorporation of Back-up Means of ANS Into Siren Design Report, dated 10/5/2012PSEG Nuclear LLC Emergency Plan, Section 6.0, Notification Methods – Response  
Organizations, Revision 18**Section 1EP3: Emergency Response Organization Staffing and Augmentation System**Procedures

EP-AA-120-1007, Maintenance of Emergency Response Organization, Revision 5

EP-AA-120-1010, ERO Training Administration, Revision 0

EP-AA-121-1001, Automated Call-Out System Maintenance, Revision 1

HC.EP-EP.ZZ-0204, Emergency Response Callout/Personnel Recall, Revision 2

SC.EP-EP.Z-0204, Emergency Response Callout/Personnel Recall, Revision 2

Other Documents

ERO roster dated 7/13/2015

ERO training records dated 7/14/2015

Hope Creek Generating Station and Salem Generating Station, On-Shift Staffing Analysis Report, Revision 0

Monthly pager test results January 2014-June 2015

PSEG Nuclear LLC Emergency Plan, Section 3.0, Emergency Organization, Revision 30

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 5

EP-AA-120-1001, 10 CFR 50.54(q) Change Evaluation, Revision 3

EP-AA-121, Emergency Response Facilities and Equipment Readiness, Revision 2

EP-AA-121-1003, Equipment Important to Emergency Response – Work Prioritization, Revision 0

EP-AA-122, Drills and Exercises, Revision 4

EP-AA-122-1002, Drill and Exercise Evaluation, Revision 0

EP-AA-124-1001, Facilities Inventories and Surveillances, Revision 2

EP-AA-125, Emergency Preparedness Self Evaluation Process, Revision 1

LS-AA-104, 50.59 Review Process, Revision 6

WC-AA-106, Work Week Screening and Processing, Revision 12

Other Documents

Audit NOSA-HPC-14-02, Emergency Preparedness Audit Report, dated 4/9/2014

Audit NOSA-HPC-15-02, Emergency Plan, Procedures, Facilities, and Interfaces Audit Report, dated 3/25/2013

Check-In Self-Assessment (70161506) for NRC Inspection and Graded Exercise Preparations

Check-In Self-Assessment (70163699) for EP Drill and Exercise Performance (DEP) Indicator

Check-In Self-Assessment (80112281) for Knowledge Retention and Transfer – Emergency Preparedness

Check-In Self-Assessment (80112333) for Emergency Preparedness Training Program

Check-In Self-Assessment (80112351) for ERO Staffing and Augmentation System

H15-01, Emergency Preparedness Onsite Drill Critique Report

Memoranda of Understanding between Department of Commerce – National Weather Service and PSEG Nuclear, LLC

Memoranda of Understanding Cumberland County Office of Emergency Management and PSEG Nuclear, LLC

Memoranda of Understanding Delaware Department of Safety and Homeland Security, Delaware Emergency Management Agency and PSEG Nuclear, LLC

Memoranda of Understanding Kent County Department of Public Safety Kent County EOC and PSEG Nuclear, LLC

Memoranda of Understanding Maryland Emergency Management and Civil Defense Agency/NJ State Police

Memoranda of Understanding Memorial Hospital of Salem County and PSEG Nuclear, LLC

Memoranda of Understanding New Castle County Delaware, Delaware Emergency Management Agency and PSEG Nuclear, LLC

Memoranda of Understanding NJ State Police/NJ Department of Environmental Protection/PSEG

Memoranda of Understanding Pennsylvania Emergency Management Agency/NJ State Police  
 Memoranda of Understanding Salem County Department of Emergency Services and PSEG  
 Nuclear, LLC

Memoranda of Understanding Township of Lower Alloways Creek and PSEG Nuclear, LLC  
 NOH-12-028, Nuclear Oversight 3C12 Mid-Cycle Assessment Report, dated 2/13/2013  
 NOSPAC-HC-13-2C, Nuclear Oversight Assessment Report, May through August 2013  
 NOSPAC-HC-13-3C, Nuclear Oversight Assessment Report, September through December 2013  
 NOSPAC-HC-14-1C, Nuclear Oversight Assessment Report, January through May 17, 2014  
 NOSPAC-HC-14-2C, Nuclear Oversight Assessment Report, May 15 through August 31, 2014  
 NOSPAC-HC-14-3C, Nuclear Oversight Assessment Report, September 1 through  
 December 31, 2014

NOSPAC-HC-15-1C, Nuclear Oversight Assessment Report, January 1 through April 30, 2015  
 PSEG Nuclear LLC Emergency Plan, Revision 76  
 Salem-Hope Creek Nuclear Generating Station Development of Evacuation Time Estimates,  
 Revision 0

S14-01, Emergency Preparedness Onsite Drill Critique Report  
 S14-02, Emergency Preparedness Onsite Drill Critique Report  
 S14-03, Emergency Preparedness Onsite Drill Critique Report

**Section 40A1: Performance Indicator Verification**

Procedures

EP-AA-125-1001, EP Performance Indicator Guidance, Revision 1  
 EP-AA-125-1002, ERO Performance - Performance Indicators Guidance, Revision 4  
 EP-AA-125-1003, ERO Readiness - Performance Indicators Guidance, Revision 1  
 EP-AA-125-1004, ANS Reliability - Performance Indicators Guidance, Revision 1

Notifications

20664453      20665081

Evaluations

70170173      70175166

Miscellaneous

ANS Reliability PI data, April 2014 – June 2015  
 DEP PI data, April 2014 – June 2015  
 ERO Drill Participation PI data, April 2014 – June 2015

Other

Heat Removal MSPI Derivation Reports for Units 1 and 2 Unavailability and Unreliability Indices  
 for June 2014 and June 2015  
 Residual Heat Removal MSPI Derivation Reports for Units 1 and 2 Unavailability and  
 Unreliability Indices for June 2014 and June 2015

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

Notifications

20696297*	20697305*	20698168*	20699374*	20699420*	20699499*
20699500*	20699621*	20699622*	20699623*	20700604*	20702267*
20702656*	20702959*	20702999*	20703857*	20703868*	

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

EP-AA-125-1002-F01, DEP Observation Checklist, Revision 4  
 EP-SA-111-109, Section H – Hazards & Other Conditions Affecting Plant Safety, Revision 0  
 EP-SA-111-209, SGS ECG – EAL Technical Basis, EAL Category H – Hazards & Other  
 Conditions Affecting Plant Safety, Revision 0  
 EP-SA-111-F1, Attachment 1, Unusual Event, Revision 2  
 EP-SA-111-F5, Attachment 5, NRC Data Sheet & Completion Reference, Revision 0  
 EP-SA-111-F6, Attachment 6, Primary Communicator Log, Revision 12  
 EP-SA-111-F8, Attachment 8, Secondary Communicator Log, Revision 2  
 FP-AA-015, Compensatory Measure Firewatch Program, Revision 6  
 FP-SA-003, Actions for Inoperable Fire Protection – Salem Station, Revision 1  
 NC.EP-EP.ZZ-0102, Emergency Coordinator Response, Revision 19  
 NC.EP-EP.ZZ-0301, Shift Radiation Protection Technician Response, Revision 13  
 NC.EP-EP.ZZ-0309, Dose Assessment (MIDAS) Instructions, Revision 13  
 NC.EP-EP.ZZ-0405, Emergency Termination – Reduction - Recovery, Revision 7

Notifications

20138426	20576105	20696408	20696409	20696410	20696411
20696412	20696471	20696476	20696675	20696677	20696725
20697478*	20697842*	20699726*	20699729*		

Maintenance Orders/Work Orders

70143554

Other Documents

NEI 99-01

**Section 40A5: Other Activities**Condition Reports

20477361	20518557	20523502	20524311	20674595	20686044
20688822	20689247	20690936	20690951	20695648	20695648
20696512	20696622	20697849	20698052	20698102	20698149

Completed Surveillance and Functional Testing

HC.MD – FR.DCS-0002, Revision 4, Offloading and Receiving Dry Storage Components  
 Upender Frame Load Test (DWG 2500), Revision 0  
 HC.MD – FR.DCS-0001, Hi-Storm System Receipt Inspection, Revision 2  
 HC.OP-DL.ZZ-0026(Q), Attachment 1e, Surveillance Log - Yard  
 Radiological Survey 1310002CS-6 HI-TRAC MPC#0313 7/29/15 0500  
 Radiological Survey 1310002CS-6 HI-TRAC MPC#0313 7/29/15 0100  
 Radiological Survey 1310002CS-5 U1 FHB 100'/118' Decon Pit 7/29/15 0830  
 Radiological Survey 1310002 U1 FHB 100' Decon Room 7/29/15 0830  
 Radiological Survey 1310002CS-5 U1 FHB 7/29/15 0300  
 Radiological Survey 1310002 U1 FHB 100' Decon Room 7/29/15 0800  
 Radiological Survey 2310003D3 U2 FHB Truck Bay MPC Serial #0133 6/22/12 1205  
 Radiological Survey 2310003D3 U2 FHB Truck Bay MPC Serial #0249 7/2012 1200  
 Radiological Survey 2310003D3 U2 FHB Truck Bay MPC Serial #0249 6/30/12 1325

RP-SA-303, Form 1, HI-TRAC Radiation Survey, MPC Serial Number 0133  
RP-SA-304, Form 1, HI-STORM Radiation Survey, HI-STORM Serial Number 30352  
2012 Annual Radiological Environmental Report  
2013 Annual Radiological Environmental Report  
2014 Annual Radiological Environmental Report

Design and Licensing Basis Documents

Calculation Number A-5-DCS-MDC-1957, Direct Dose Rates in the Vicinity of the Salem & Hope Creek ISFSI, Revision 01R1  
Design Analysis No. S-C-DCS-NDC-2285, Salem Dose Rates in the Vicinity of a HI-STORM 100SB and 100 Ton HI-TRAC 100D, Revision 0

Engineering Evaluations

ALARA Plan # 2015-027, U-1 SFP Dry Cask Storage Campaign  
ALARA Plan #2012-25, U-2 SFP Dry Cask Storage Campaign  
DS1.6-0634, Salem 1 DCS Fuel/Component Characterization Cycles 20 to 23

Procedures

ASME Section IX Welding Procedures Specification 8MC-GTAW, Revision 15  
GQP 9.2, Hi Temperature Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials, and Cladding (50-350F), Revision 8  
GQP 9.6, Visual Examination of Welds, Revision 14  
HC.MD – FR.DCS-0002, Offloading and Receiving Dry Storage Components, Revision 4  
MA AA716 022, Control of Heavy Loads Program, Revision 12  
PI-CNSTR-EM-SC-115, Canister Weld – Gold Track VI Power Supply and Modified “G Head” Canister Closure Weld System – System Configuration, Revision 0  
PI-CNSTR-H2-01, Hydrogen Monitoring System – Configuration, Revision 0  
PI-CNSTR-OP-HCS-H-01, Closure Welding of Holtec Multi-Purpose Canister at Hope Creek and Salem Facilities, Revision 0  
RKI Instruments Instruction Manual, Eagle Series – Portable Multi-Gas Detector Part Number 71-0028RK, Released 2/16/11, Revision C  
RP-AA-401, Operational ALARA Planning and Controls, Revision 13  
RP-SA-303, HI-TRAC Radiation Survey, Revision 0  
RP-SA-304, HI-STORM Radiation Survey, Revision 1  
SC.MD-FR-DCS-0004 (Q), MPC Preparations for Loading, Revision 6  
SC.MD-FR.DCS-0003(Q), Transport Loaded and Unloaded Hi-Storm and Hi-Trac WCP-3 Weld Material Control, Revision 7  
SC.RE-FR.DCS-0002(1), Dry Cask Storage Fuel Selection for Cask Loading, Revision 5  
SC.RE-FR.ZZ-0007(Q), Verification of Fuel Locations, Revision 7  
WCP-5 Weld and Base Metal Repair

Training

PCI ASME IX Welding Procedures Qualification Records

Work Orders

70172541 Perform Dry Cask Storage FASA July 2015  
70176071 Rigging Qualifications required for DCS  
70178582 Request FHV Opeval for Dry Cask  
80106601 Salem Unit 2 DCS Lessons Learned 2012

80109865 Independent Spent Fuel Storage Installation Report, Audit NOSA-HPC-13-06 Hope  
 Creek and Salem Generating Stations, August 10, 2013 to September 6, 2013  
 80111993 Hope Creek DCS Lessons Learned 2014

**Miscellaneous**

RWP 1, Routine Surveillances, Maintenance & Inspections  
 Radiation Protection Job Guide, 6/30/2014, Revision 6

**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
AFW	Auxiliary feedwater
ALARA	As Low As is Reasonably Achievable
ANS	Alert and Notification System
CAP	corrective action program
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
EDG	Emergency diesel generator
EP	Emergency Preparedness
ERF	Emergency Response Facility
ERO	Emergency Response Organization
EQACE	Equipment Apparent Cause Evaluation
FEMA	Federal Emergency Management Agency
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
JPM	job performance measure
kV	kilovolt
LER	Licensee Event Report
MPC	Multi-Purpose Canister
MR	maintenance rule
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PI	Performance Indicator
PCIV	Primary Containment Isolation Valve
PSEG	Public Service Enterprise Group Nuclear LLC
RCP	reactor coolant pump
SFP	Spent Fuel Pool
SSC	structure, system, and component
TDAFW	turbine driven AFW
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
UV	undervoltage