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

November 14, 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 05000272/2017003 AND 05000311/2017003

Dear Mr. Sena:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Salem Nuclear Generating Stations (Salem), Units 1 and 2. On October 10, 2017, the NRC inspectors discussed the results of this inspection with Mr. Charles McFeaters, Salem Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. Additionally, NRC inspectors documented one Severity Level IV violation. 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 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 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. In addition, if you disagree with a cross-cutting aspect assignment 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 U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC, 20555-0001; with copies to the Regional Administrator, Region I, 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

Enclosure:
Inspection Report 05000272/2017003 and
05000311/2017003
w/Attachment: Supplementary Information

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SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 – INTEGRATED INSPECTION REPORT 05000272/2017003 AND 05000311/2017003 DATED NOVEMBER 14, 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.	05000272/2017003 and 05000311/2017003
Licensee:	PSEG Nuclear LLC (PSEG)
Facility:	Salem Nuclear Generating Station, Units 1 and 2
Location:	Hancocks Bridge, NJ 08038
Dates:	July 1, 2017 through September 30, 2017
Inspectors:	P. Finney, Senior Resident Inspector A. Ziedonis, Resident Inspector R. Barkley, Senior Project Engineer T. Fish, Senior Operations Engineer J. Furia, Senior Health Physicist
Approved By:	Fred L. Bower, III, Chief Reactor Projects Branch 3 Division of Reactor Projects

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SUMMARY

Inspection Report (IR) 05000272/2017003, 05000311/2017003; 07/01/2017 – 09/30/2017; Salem Nuclear Generating Station Units 1 and 2; 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 finding and one self-revealing finding of very low safety significance (Green). The inspectors also identified one Severity Level IV violation. All three findings 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 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.

Cornerstone: Mitigating Systems

- Severity Level IV. Inspectors identified a Severity Level IV (SLIV) non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z) when a periodic Inservice Test (IST) of the 14 service water (SW) pump and its strainer outlet check valve was not completed prior to expiration of its testing frequency on August 4 without Nuclear Reactor Regulation (NRR) authorization. PSEG's corrective actions (C/As) included making repairs to the 14 SW strainer, satisfactory completion of the 14 SW IST on August 21, chartering an apparent cause evaluation (ACE), and entering the issue in their Corrective Action Program (CAP) as notification (NOTF) 20772390.

  The issue was assessed in accordance with IMC 0612 and traditional enforcement applied since the issue impeded the regulatory process. Specifically, PSEG did not perform the prescribed IST or obtain prior NRR authorization for an alternative measure in accordance with 10 CFR 50.55(a)(z). The Reactor Oversight Process's (ROP) significance determination process does not specifically consider regulatory process impact in its assessment of licensee performance. Therefore, it was necessary to address this violation, which impeded the NRC's ability to regulate, using traditional enforcement to adequately assess the non-compliance. The violation was determined to be a SLIV since: 1) the delay in the inservice test required, and PSEG did not obtain, prior Commission review and approval, 2) the associated consequence was minor or of very low safety significance, and 3) the NRC would have likely approved an alternative, given reasonable assurance of operability of the 14 SW train, in accordance with Section 6.1 of the NRC Enforcement Policy. The NRC also determined this violation was associated with a minor ROP performance deficiency. Traditional enforcement violations are not assessed for cross-cutting aspects. (Section 1R15)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a Green non-cited violation (NCV) of Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.6.1.1, "Containment Integrity," when PSEG did not ensure that the APD backup CIVs, associated with penetrations required to be closed during accident conditions, were unisolated intermittently under appropriate administrative controls. Specifically, manual CIVs associated with the APD sampling system were opened and left continuously open for 27 days, under tagging instructions that would have resulted in an actual open penetration outside of containment during certain design basis accidents and PSEG had not evaluated the adequacy of the tagging instruction to ensure radiological dose consequences would remain in conformance with the licensing basis. PSEG entered this issue in the Corrective Action Program (CAP) as notifications (NOTFs) 20751423 and 20777663. Technical Specification (TS) compliance was restored on January 4, 2017, when PSEG restored the normal air APD sample valve configuration.

  This issue was more than minor since it was associated with the configuration control attribute of the Barrier Integrity cornerstone and adversely impacted its objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide release cause by accidents or events. Using Appendix H, the inspectors determined this finding was of very low safety significance, or Green, because this was a Type B finding (Section 4.0), involving small diameter lines that were not important to large early release frequency (LERF), as described in Table 4.1. The finding had a cross-cutting aspect in the area of Human Performance, Work Management, in that the organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the planned tagging instructions for control of the back-up sampling valves did not ensure the work activity was controlled and executed in accordance with TS. [H.5] (Section 1R15)

- Green. A self-revealing Green non-cited violation (NCV) of Technical Specification (TS) 6.8.1, "Procedures and Programs," as described in Regulatory Guide 1.33, Revision 2, was identified because PSEG did not install the 12 service water (SW) accumulator injection check valve (12SW536) in accordance with written procedures. Specifically, the check valve was installed in the wrong orientation, which impacted the ability of the valve to close and support containment integrity. PSEG entered this issue in the Corrective Action Program (CAP) as notifications (NOTFs) 20771353 and 20776321, and performed Equipment Reliability Evaluation (ERE) 70195309. Corrective actions (C/As) consisted of removing the check valve from the system, clearing the silt build-up, and reinstalling the check valve in the correct orientation.

  This issue was more than minor since it was associated with the configuration control attribute of the Barrier Integrity Cornerstone and adversely impacted its objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases cause by accidents or events. Using IMC 0609, Attachment 4 and Appendix A, Exhibit 3, the inspectors determined that this finding was of very low safety significance, or Green, because the finding did not result in an actual open pathway in the physical integrity of reactor containment. The inspectors determined there was no cross-cutting aspect associated with this finding because the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance, in accordance with IMC 0612. (Section 1R22)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). 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. On September 2, the unit made an unplanned power reduction to approximately 15 percent RTP in support of stator water cooling corrective maintenance. The unit returned to 100 percent RTP on September 5. 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 – 3 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

During the week of August 28, inspectors performed a review of PSEG's readiness for the hurricane season. The review focused on the service water intake structure (SWIS), the circulating water intake structure, and auxiliary building penetrations. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TSs), control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure PSEG personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including PSEG's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hurricane conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed PSEG's preparations for the onset of hot weather on July 20. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The inspectors walked down the emergency diesel generators (EDGs) and SWIS to ensure system availability. The inspectors verified that operator actions defined in PSEG's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel.

b. Findings

No findings were identified

.3 External Flooding

a. Inspection Scope

During the week of July 5, the inspectors performed an inspection of the external flood protection measures for Salem Unit 1 and Unit 2. The inspectors reviewed TSs, procedures, design documents, and the UFSAR, which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors conducted a general site walkdown of all external areas of the plant, including the EDG annex, turbine building basement and SW vaults to ensure that PSEG erected flood protection measures in accordance with design specifications. Where applicable the inspectors determined the installed flood seal service life and verified that adequate procedures existed for inspecting the installed seals. The inspectors also reviewed operating procedures for mitigating external flooding, to confirm that, overall, PSEG had established adequate measures to protect against external flooding events and, more specifically, that credited operator actions were adequate.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdown (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, SW system with 11 SW pump out of service (OOS) on July 26
- Unit 2, EDGs during emergent inoperability of 2B EDG on July 10
- Common, Single offsite power source during bus Section 2 maintenance on September 20

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

b. Findings

No findings were identified.

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 OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1, Component cooling water (CCW) heat exchanger (HX) area on September 6
- Unit 2, SWIS on July 17
- Unit 2, Charging pump and spray additive tank area on July 25
- Common, Turbine building basement on July 6

b. Findings

No findings were identified.

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

Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 29, which included a condenser tube leak, small break and large break loss of coolant accidents, pressurizer instrument failure, condensate pump trip, main steam line leak, and multiple faulted steam generators. The inspectors evaluated operator performance during the simulated events 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.

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 (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, SW pump strainers on July 27
- Unit 1, 11SW3, 11 SW discharge valve on August 7

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 samples)

a. Inspection Scope

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

- Unit 1, Yellow Risk due to 11 CCW HX OOS for maintenance on July 25
- Unit 1, Emergent repair of 11SW3 with 1 SW bay inoperability on August 9
- Unit 1, Fire in (a)(4) risk with 16 SW pump unavailable on September 6
- Unit 2, Emergent unavailability of 2B EDG on July 10

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, 12 containment fan cooling unit (CFCU) degraded motor megger and failure to start in high speed on July 19
- Unit 1, Containment isolation valves for air particulate detector back-up sampling on August 3
- Unit 1, 14 SW pump IST not performed on August 7
- Unit 2, 2B EDG following K1C relay failure on July 12
- Unit 2, Containment with outer equipment hatch removed on August 31
- Unit 2, CFCU SW valve room moderate energy line break (MELB) doors left open on September 27
- Common, Functionality of seismic trigger during instrument maintenance activity on September 26

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.

b. Findings

.1 Expiration of Periodic Inservice Testing of 14 Service Water Pump

Introduction. Inspectors identified a SLIV NCV of 10 CFR 50.55a(z) when a periodic IST of the 14 SW pump and its strainer outlet check valve was not completed prior to expiration of its testing frequency without NRR authorization.

Description. The Salem Unit 1 SW system consists of two trains of three pumps each in independent compartments that are valved into one of two independent supply headers. Each SW pump discharges to its own automatic, self-cleaning strainer and check valve prior to entering the compartment supply header. Title 10 CFR 50.55(a)(f)(4) requires that pumps and valves that are classified as American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 must meet the IST requirements set forth in the ASME Operation and Maintenance (OM) code and addenda to the extent practical. Since the SW pumps and their strainer outlet check valves are ASME Code Class 3, they are subject to the ASME OM code and the associated periodic testing. Salem's ASME OM Code version of applicability is ASME OM Code-2001 through the ASME OMb Code-2003 Addenda. Tables ISTB-3400-1 and ISTC-3500-1 respectively establish a quarterly IST frequency for Group A pumps and Category C check valves, such as the 14 SW pump and its strainer outlet check valve.

On April 11, 2017, an IST of 14 SW was completed. Based on a 92-day test interval, the next quarterly nominal due date was July 12. On July 16, during the subsequent 14 SW IST, the pump strainer differential pressure (D/P) would not lower sufficiently to allow the strainer backwash cycle to stop. The IST data is invalidated with the strainer in backwash and the IST could not be completed. Operators performed a backflush of the strainer which lowered D/P and stopped the backwash cycle, but the strainer backwash recommenced during a subsequent IST attempt. PSEG documented (NOTF 2077137) this condition and acknowledged that the IST would go overdue on August 4 given application of a 25 percent grace period allowed by ASME OMN-20. PSEG determined, via discussions with the vendor that had refurbished the strainer, and documented in the same NOTF on July 18, that the strainer element was likely improperly assembled with its filter media elements installed backwards. On August 3, PSEG wrote NOTF 20772751 regarding the continued inability to perform the 14 SW pump IST and requested an Operability Evaluation (OpEval) to support continued operation for the 14 SW pump being in a condition that is Operable but Nonconforming to an ASME commitment. In the associated OpEval 17-006 (operation 70195617), PSEG determined that the 14 SW pump remained operable given reasonable assurance in procedures and calculations that the SW pump was able to perform its safety function with the strainer in continuous backwash. Additionally, in the OpEval, PSEG documented its decision to not perform the 14 SW pump and 14 SW check valve (14SW2) IST based on a determination that, although not performing the IST would be in noncompliance with the ASME code, it would not be a violation of regulatory requirements, since PSEG concluded the test was not required by site TSs. On August 8, PSEG documented NRC resident inspector questions regarding not performing the 14 SW IST (NOTF 20772390).

As part of their assessment, the inspectors reviewed PSEG's IST program and other licensing documents. On August 30, 2016, PSEG submitted a license amendment request (ML16243A233) in accordance with 10 CFR 50.55a(z), that proposed an alternative to the testing frequencies in the ASME OM Code by adopting Code Case OMN-20. Code Case OMN-20, "Inservice Test Frequency," allowed test frequency grace to be applied to ASME OM test frequencies. In particular, quarterly tests were established with periods of 92 days and that the period may be extended by up to 25 percent for any given test. On May 19, 2017, the NRC issued its Safety Evaluation Report and approved the relief request (ML17132A005) to adopt ASME Code Case OMN-20.

Through discussions with both PSEG and NRC Regional and NRR staff, the inspectors concluded that while operators had appropriately assessed that the 14 SW pump remained operable given the strainer condition, PSEG had incorrectly determined that IST performance could be delayed beyond the overdue date without violating regulatory requirements. The inspectors' conclusion was based not only on the guidance in the ASME OM Code and OMN-20, but also on review of PSEG's OpEval. In particular, PSEG's OpEval referenced EGM 12-001, "Dispositioning Noncompliance with Administrative Controls Technical Specifications Programmatic Requirements that Extend Test Frequencies and Allow Performance of Missed Tests" (ML11258A243), where the NRC stated that it would exercise enforcement discretion to allow application of Surveillance Requirement (SR) applicability to TS administrative controls and licensee noncompliance with the IST program as described in the Administrative Controls section of TSs. However, EGM 12-001 was not appropriately applied in this case because the SW system IST requirement does not reside in the associated TS SRs, the IST was not performed as opposed to discovered after the fact as a missed test, and EGM 12-001

expired upon the NRC's disposition of PSEG's license amendment request as described within its own guidance when Amendment No. 319 was issued on June 28, 2017 (ML17165A214). The inspectors further noted that 10 CFR 50.55(a)(a) requires that proposed alternatives to ASME IST testing requirements must be submitted to NRR, and are required to be authorized prior to implementation. The inspectors determined that in lieu of performing repairs to the 14 SW strainer and successfully completing the IST within the required grace period, PSEG would have been required to obtain prior authorization for alternative testing of the 14 SW IST components under 10 CFR 50.55(a)(z), instead of allowing the test to expire. PSEG's C/As included completing 14 SW strainer repairs, satisfactory completion of the 14 SW IST on August 21, and chartering an apparent cause evaluation (ACE).

Analysis. Not performing the 14 SW IST or obtaining prior authorization for an alternative in accordance with 10 CFR 50.55(a)(z) was a performance deficiency within PSEG's ability to foresee and correct. The issue was assessed in accordance with IMC 0612 and traditional enforcement applied since the issue impeded the regulatory process. Specifically, PSEG did not perform the prescribed IST or obtain prior authorization for an alternative in accordance with guidance in 10 CFR 50.55a. The ROP's significance determination process does not specifically consider regulatory process impact in its assessment of licensee performance. Therefore, it was necessary to address this violation, which impeded the NRC's ability to regulate, using traditional enforcement to assess the non-compliance.

The violation was determined to be a SLIV in accordance with Section 6.1 of the Enforcement Policy since the associated consequence was minor or of very low safety significance, and the NRC would have likely approved an alternative test interval given reasonable assurance of operability of the 14 SW train. In accordance with IMC 0612, the NRC also determined this violation was associated with a minor ROP performance deficiency. Traditional enforcement violations are not assessed for cross-cutting aspects.

Enforcement. Title 10 CFR 50.54, establishes that the applicable requirements of 10 CFR 50.55a are conditions in every nuclear power reactor operating license. Title 10 CFR 50.55a(z) requires, in part, that alternatives to the requirements of 10 CFR 50.55a(f) may be used when authorized by the NRC and that the proposed alternative must be submitted and authorized prior to implementation. Title 10 CFR 50.55a(f) requires, in part, that systems and components of water-cooled nuclear power reactors must meet the requirements of ASME OM Code. ASME OM Code-2001, Tables ISTB-3400-1 and ISTC-3500-1, respectively, establish a quarterly IST frequency for Group A pumps and Category C check valves, such as the 14 SW pump and its strainer outlet valve. ASME Code Case OMN-20 allows test frequency grace periods of up to 25 percent for quarterly tests with periods established at 92 days. Contrary to the above, from August 4 to August 21, 2017, PSEG implemented an alternative to the ASME OM Code without first obtaining authorization from the NRC. Specifically, PSEG did not perform the 14 SW quarterly IST in accordance with test requirements within the 92 day period (July 12) plus the 25 percent grace period (August 4) and did not submit and obtain prior NRC authorization for this alternative measure. PSEG subsequently completed the 14 SW IST on August 21 and captured the issue in their CAP as NOTF 20772390. Since the issue was of minor or very low safety significance and was entered into PSEG's CAP, this violation is being treated as an NCV, consistent

with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000272/2017003-01, Expiration of Periodic Inservice Testing of 14 Service Water Pump)**

.2 Violation of Containment Integrity Technical Specification

Introduction. The inspectors identified a Green NCV of TSs LCO 3.6.1.1, "Containment Integrity," when PSEG did not ensure that the APD backup CIVs, associated with penetrations required to be closed during accident conditions, were unisolated intermittently under appropriate administrative controls. Specifically, manual CIVs associated with the APD sampling system were opened and left continuously open for 27 days, under tagging instructions that would have resulted in an actual open penetration outside of containment during certain design basis accidents and PSEG had not evaluated the adequacy of the tagging instruction to ensure radiological dose consequences would remain in conformance with the licensing basis.

Description. On December 8, 2016, PSEG closed two normally open inboard (1VC7 and 1VC11) and outboard (1VC8 and 1VC12) automatic CIVs associated with the Unit 1 containment APD one-inch diameter containment penetrations, which are open to the containment atmosphere and pass to the APD sampling detector outside of containment. The control power breaker associated with the automatic APD CIVs was opened under tagging instruction 4402568 to support planned maintenance to replace a control area radiation monitor (1-R1A). With the automatic APD CIVs closed, tagging instruction 4402568, and operator turnover notes, directed PSEG operators to open two normally closed inboard (1VC9 and 1VC13) and outboard (1VC10 and 1VC14) backup APD remote manual CIVs.

On December 12, 2016, the inspectors questioned PSEG operators regarding the basis for operability of the backup APD CIVs, given that remote manual closure, using pushbutton(s) in the main control room, would be required to ensure the safety function was met during a design basis accident. PSEG operators cited procedure OP-AA-108-115, "Operability Determinations and Functionality Assessments," Revision 4, Section 4.15, "Use of Manual Actions in Place of Automatic Actions," as the basis for operability. PSEG operators stated that one of two licensed operators at the controls was credited to close the remote manual CIVs from the control room, in accordance with tagging instruction 4402568, and step 10 of Emergency Operating Procedure (EOP) 1-EOP-TRIP-1, "Reactor Trip or Safety Injection," Revision 31. The inspectors evaluated the EOP to assess whether the planned manual action would be consistent with the applicable licensing and design bases analyses. The inspectors observed that 1-EOP-TRIP-1, step 10, was not a continuous action step. The inspectors further questioned whether the timing of the manual actions, and associated dose consequence, had been evaluated prior to implementation of the tagging instructions. PSEG operators stated that the maintenance activity was pre-planned as part of the work control process, and the manual controls were adequate. PSEG operators captured the inspectors' question in NOTF 20751423. When the inspectors questioned PSEG operations management as to whether any additional controls or evaluation were warranted to ensure CIV operability during the planned maintenance activity, PSEG re-stated that the existing controls were adequate, and the inspectors' question would be addressed through the CAP.

On January 4, 2017, PSEG completed the 1-R1A replacement, and restored the normal APD valve configuration. On May 12, PSEG provided the inspectors with Technical

Evaluation (TE) 70191433 that evaluated the radiological consequences of operating with backup APD CIVs opened under tagging instruction 4402568. The TE determined the increase in radiological dose was insignificant with respect to the previously analyzed values in UFSAR Table 15.4-5C, "Loss of Coolant Accident (LOCA) Dose Consequences." Specifically, the TE concluded the most limiting consequence was for the main control room dose, and determined there would be less than a 0.01 rem increase to the previously analyzed value of 4.3 rem.

The inspectors concluded the TE was inadequate, primarily because the TE incorrectly assumed the CIVs would be remotely isolated prior to the onset of fuel damage. Specifically, the TE assumed no fuel damage for the first 10 minutes of the accident. However, the inspectors noted the Salem licensing basis was previously reviewed and approved by the NRC with an assumed onset of fuel damage at 30 seconds, in accordance with the NRC Safety Evaluation Report associated with the Alternate Source Term License Amendment (ML060040322), as well as station calculation S-C-ZZ-MDC-1945, "Post-LOCA Doses – Alternate Source Term (AST), Revision 4." The inspectors determined that PSEG's non-conservative time assumption (10 minutes versus 30 seconds) prior to the onset of fuel damage, had a direct correlation to the postulated dose consequences. Specifically, the TE determined that for the most limiting accident, the containment atmosphere would be released into the Auxiliary Building in approximately 10 seconds, due to containment pressure exceeding the APD sample skid rating of 15 psig. The inspectors further noted the TE assumed the backup APD sample valves would be closed in accordance with the EOPs in approximately 8 minutes, based on previous timed evaluation of a separate step in 1-EOP-TRIP-1, OP-SA-102-106-F1, "Master List of Times Actions," Revision 1. However, the inspectors determined that the master list of timed actions did not fully evaluate the time required to isolate CIVs; for example, it did not account for certain conditions in 1-EOP-TRIP-1 that could direct Operators to other EOPs prior to isolating the CIVs in step 10.

The inspectors reviewed TS LCOs 3.6.1.1, "Containment Integrity," and 3.6.3.1, "Containment Isolation Valves." TS LCO 3.6.1.1 states that primary CONTAINMENT INTEGRITY shall be maintained. TS 1.7 defines CONTAINMENT INTEGRITY as all penetrations required to be closed during accident conditions are either capable of being closed automatically, or otherwise secured in their closed position, except as permitted by TS 3.6.3.1. TS LCO 3.6.3.1 states that each containment isolation valve shall be OPERABLE, and the action statements are modified by Note 1, which states that penetration flow paths, except for the containment purge valves, may be unisolated intermittently under administrative controls. Since Note 1 modifies the LCO 3.6.3.1 action statements, entry into an action statement would be required to invoke Note 1. However, the inspectors identified that PSEG never entered a TS LCO 3.6.3.1 action statement to apply administrative controls when the backup APD manual valves were opened on December 8, 2016. The inspectors also reviewed the UFSAR Table 6.2-10, and noted the list of CIVs is contained in the Technical Requirements Manual (TRM). TRM Table 3.6-1 classifies the APD back-up sample valves as remote manual containment isolation valves. UFSAR Section 6.2.4.3, item 3, states manual containment isolation valves are operated under administrative control. UFSAR accident analysis Sections 15.4.1.8 and 15.4.1.9 discuss the alternate source term analysis results for the most limiting loss of coolant accident. Based on a review of the TS, UFSAR, TRM, and TE 70191433, the inspectors concluded that PSEG's use of tagging instruction 4402568 to control opening manual CIVs continuously for 27 days was not in compliance with TSs, because the backup APD manual valves were not opened

intermittently, and the administrative controls were not adequate to ensure the radiological dose consequences would remain in conformance with the licensing basis.

Analysis. The inspectors determined there was a performance deficiency that was within PSEG's ability to foresee and correct. Specifically, TS 3.6.1.1 requires manual containment isolation valves to be secured in their closed position, or opened intermittently under administrative control as permitted by TS 3.6.3.1; however, the containment APD backup sampling manual CIVs were opened continuously for 27 days under administrative controls that were not properly reviewed and determined to be adequate under accident conditions. This issue was more than minor since it was associated with the configuration control attribute of the Barrier Integrity cornerstone and adversely impacted its objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide release cause by accidents or events. Specifically, containment isolation valves were opened continuously for 27 days, contrary to TS, and would have resulted in an actual open pathway outside of containment during certain design basis accidents. Using IMC 0609, Attachment 4 and Appendix A, Exhibit 3, this finding was required to be screened in accordance with IMC 0609, Appendix H, "Containment Integrity Significance Determination Process." Using Appendix H, the inspectors determined this finding was of very low safety significance, or Green, because this was a Type B finding (Section 4.0), involving small diameter lines that were not important to LERF, as described in Table 4.1.

The finding had a cross-cutting aspect in the area of Human Performance, Work Management, in that the organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the planned tagging instructions for control of the back-up sampling valves did not ensure the work activity was controlled and executed in accordance with TS. [H.5]

Enforcement. Technical Specification LCO 3.6.1.1 action statement requires that without primary containment integrity, restore containment integrity within one hour or be in at least Mode 3 within the next six hours and Mode 5 within the following 30 hours. TS 1.7 defines CONTAINMENT INTEGRITY as all penetrations required to be closed during accident conditions are either capable of being closed automatically, or otherwise closed by manual valves, except for valves that are open under administrative control as permitted by TS 3.6.3.1.

Technical Specification 3.6.3.1, action 1, requires that with one or more containment isolation valves inoperable, maintain at least one isolation valve operable in each affected penetration that is open, and within four hours either restore the inoperable valve(s) or isolate the affected penetration, or be in at least Mode 3 within the next six hours and in Mode 5 within the following 30 hours. Action 1 is modified by note 1, which states penetration flow paths, except for the containment purge valves, may be unisolated intermittently under administrative controls.

Contrary to the above, from December 8, 2016, to January 4, 2017, PSEG did not ensure that the APD backup CIVs, associated with penetrations required to be closed during accident conditions, were unisolated intermittently under appropriate administrative controls. Specifically, the CIVs were opened continuously for this 27 day period, without entry into LCO action 3.6.3.1, action 1. Additionally, the administrative controls applied consisted of a tagging instruction and turnover note for one of the two licensed operators at the controls to remotely close the CIVs from the control room in

accordance with an EOP. The valve configuration would have resulted in an actual open pathway outside of containment during design basis accidents; however, PSEG had not evaluated the adequacy of the tagging instruction to ensure radiological dose consequences would remain in conformance with the licensing basis. PSEG entered this issue in the CAP as NOTFs 20751423 and 20777663. TS compliance was restored on January 4, 2017, when PSEG restored the normal APD sample valve configuration. Because this violation 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 Enforcement Policy. **(NCV 05000272/2017003-02, Violation of Containment Integrity Technical Specification)**

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

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

- Unit 2, 22 SW pump stiffeners on August 24

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, SW bearing cooling supply restricted orifice leak repair on July 31
- Unit 1, 12 Chilled water pump trip on September 18
- Unit 1, 11 ABV supply fan motor failure on September 27
- Unit 2, SW inlet valve to 22 CCW HX (22SW122) airline failure on July 22
- Unit 2, 23 Delta-T T-average deviation on September 14

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, SW accumulator check valve, 12SW536, (IST) on July 14
- Unit 1, 11 Containment spray flow test (IST) on August 2
- Unit 1, 12 CCW pump (IST) on August 2
- Unit 1, 14 SW (IST) on August 7
- Unit 1, 1C EDG endurance run on September 12

b. Findings

Introduction. A self-revealing Green NCV of TS 6.8.1, "Procedures and Programs," as described in Regulatory Guide 1.33, Revision 2, was identified because PSEG's installation of the 12 SW accumulator injection check valve (12SW536) was not in accordance with written procedures. Specifically, the check valve was installed in the wrong orientation, which impacted the ability of the valve to close and support containment integrity.

Description. The 12SW536 check valve has a safety function to open in the injection flow path from the 12 SW accumulator tank to the portion of the SW header that supplies the 14 and 15 CFCUs inside primary containment. The SW accumulator tanks have a design function to rapidly inject water into the SW system, keep the system full, and prevent a water hammer phenomena following any accident or event with a loss of off-site power (LOOP) due to the stopping and re-starting the vital bus-powered SW pumps. The 12SW536 also has a safety function to close following accumulator injection, to prevent reverse flow of SW from the 14 and 15 CFCU supply line back into the 12 accumulator tank. The 12SW536 is a dual-plate, wafer-style check valve, with central hinge pins that extend through the valve body and provide visual confirmation of check valve installation in a vertical or horizontal orientation.

On July 14, 2017, the 12SW536 failed its reverse flow quarterly IST. In response, PSEG immediately entered the action statement associated with TS LCO 3.6.1.1, "Containment Integrity," which required restoring containment integrity within one hour, or shutdown within the next six hours. PSEG operators closed manual valves and isolated the 12 SW accumulator tank from the 14 and 15 CFCUs, and exited TS LCO 3.6.1.1 in 52 minutes.

However, closing the manual isolation valves rendered 14 and 15 CFCUs inoperable, and required entry into TS LCO 3.6.2.3, “Containment Cooling System,” action a, which required restoration within seven days or shutdown within the next six hours.

With SW isolated to 14 and 15 CFCUs, PSEG subsequently drained the 12 SW accumulator tank, and opened the 12SW536 check valve for inspection. PSEG identified that the check valve was installed with the hinge pins in a horizontal orientation, and further noted that silt accumulation was impacting the ability of the bottom plate to close. PSEG performed extent of condition inspections and determined that the other three SW accumulator injection check valves on Unit 1 and Unit 2 were all installed with the hinge pins in the vertical orientation. PSEG also reviewed the vendor manual, and confirmed that the preferred orientation for a horizontal piping system was with the hinge pins in a vertical orientation. Additionally, PSEG noted that on July 10, 2017, an annual preventive maintenance (PM) activity was conducted to determine the level of silt accumulation in the piping upstream of the 12SW536. The ultrasonic testing (UT) identified four inches of silt build-up in the 10-inch diameter pipe. No further action was taken because the acceptance criteria was five inches, based on station calculation S-C-SW-MEE-1910, “Salem CFCU Accumulator Injection Piping – Allowable Levels of Silt Accumulation during Plant Operation,” Revision 1. PSEG further noted that the calculation performed a force-moment balance on the check valve plates using a vertical orientation for the hinge pins. PSEG captured the issue in CAP as NOTF 20771353, and performed ERE 70195309. The ERE concluded that the valve was installed in the incorrect orientation in 2008, during implementation of design change package (DCP) that moved the physical location of the SW accumulator injection check valves, but did not incorporate specific hinge pin orientation guidance into drawings or work instructions. PSEG created C/As to revise work instructions to incorporate specific instructions regarding hinge pin orientation during installation of the SW accumulator check valves.

The inspectors reviewed the PM history of the 12SW536, to identify if the valve had been physically worked since 2008. The inspectors reviewed a previously completed PM activity to open and inspect the valve, under WO 50092024, which was performed concurrently with the DCP activity. The inspectors noted the PM was performed in accordance with PSEG procedure SC.MD-PM.ZZ-0123, “Disassembly, Inspection and Reassembly of Dual Plate Check Valves,” Revision 13. During review of the completed procedure, the inspectors identified step 5.4.16, which required a supervisor hold point to install the check valve with the hinge pins vertical in a horizontal piping system, or horizontal in a vertical piping system, was marked “N/A” on October 22, 2008. The inspectors determined that PSEG did not follow step 5.4.16 of maintenance procedure SC.MD-PM.ZZ-0123, which resulted in the valve being installed with the hinge pins in the wrong orientation, and subsequently resulted in the failed reverse flow IST on July 14, 2017. PSEG captured the inspector-identified aspects of this issue in NOTFs in 20775965 and 20776321.

Analysis. The inspectors determined there was a performance deficiency that was within PSEG’s ability to foresee and correct because maintenance procedure SC.MD-PM.ZZ-0123, “Disassembly, Inspection and Reassembly of Dual Plate Check Valves,” Revision 13, step 5.4.16, instructed technicians to install the check valve in the correct orientation, but PSEG marked the step “N/A” and installed the valve in the wrong orientation. This issue was more than minor since it was associated with the configuration control attribute of the Barrier Integrity Cornerstone and adversely impacted its objective to provide reasonable assurance that physical design barriers

(containment) protect the public from radionuclide releases cause by accidents or events. Specifically, installing the 12SW536 check valve in the wrong orientation impacted the ability of the valve to close and support containment integrity by preventing voids and water hammer during certain design basis accidents. Using IMC 0609, Attachment 4 and Appendix A, Exhibit 3, the inspectors determined that this finding was of very low safety significance, or Green, because the finding did not result in an actual open pathway in the physical integrity of reactor containment.

The inspectors determined there was no cross-cutting aspect associated with this finding since it was not representative of current PSEG performance. Specifically, the 12SW536 valve was installed in the wrong orientation on October 22, 2008. In accordance with IMC 0612, the causal factors associated with this finding occurred outside the nominal three-year period of consideration and were not considered representative of present performance.

Enforcement. TS 6.8.1, "Procedures and Programs," states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix 'A' of RG 1.33, Revision 2, February 1978. RG 1.33, Revision 2, February 1978, Section 9, "Procedures for Performing Maintenance," states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures. Contrary to the above, on October 22, 2008, PSEG procedure SC.MD-PM.ZZ-0123, "Disassembly, Inspection and Reassembly of Dual Plate Check Valves," Revision 13, was not performed in accordance with step 5.4.16, which required a supervisor hold point to install the 12SW536 check valve with the hinge pins vertical in a horizontal piping system. Consequently, the check valve was installed with the hinge pins horizontal, which prevented the valve from closing in the presence of silt, and therefore impacted the ability of the valve to support containment integrity during certain design basis accidents. PSEG entered this issue in the CAP as NOTFs 20771353 and 20776321, and performed ERE 70195309. The C/As consisted of removing the check valve from the system, clearing the silt build-up, and reinstalling the check valve in the correct orientation on July 15, 2017. Because this violation 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 Enforcement Policy.
(NCV 05000272/2017003-03, Failure to Follow Maintenance Procedure to Assure Proper Installation of Service Water Check Valve)

2. RADIATION SAFETY

Cornerstones: Occupational and Public Radiation Safety

2RS2 Occupational As Low As Reasonably Achievable Planning and Controls
(71124.02 - 1 sample)

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.

Radiological Work Planning (1 sample)

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

- Radiation work permit (RWP) 1, Task 92, radiation protection support refuel
- RWP 24, Task 2213002, baffle bolt repairs
- RWP 22, Task 222, containment scaffold
- RWP 26, Task 15, fuel moves

For each of these activities, the inspectors reviewed: ALARA work activity evaluations, exposure estimates, exposure reduction requirements, results achieved (dose rate reductions, actual dose), person-hour estimates and results achieved and post-job reviews that were conducted to identify lessons learned.

b. Findings
No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 – 6 samples)

a. Inspection Scope

The inspectors reviewed the treatment, monitoring, and control of radioactive gaseous and liquid effluents. The inspectors used the requirements in 10 CFR Part 20; 10 CFR Part 50, Appendix I; TS; Offsite Dose Calculation Manual (ODCM); applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted in-office reviews of the Salem 2015 and 2016 annual radioactive effluent and environmental reports, radioactive effluent program documents, UFSAR, ODCM, and applicable event reports.

Walkdowns and Observations (1 sample)

The inspectors walked down the gaseous and liquid radioactive effluent monitoring and filtered ventilation systems to assess the material condition and verify proper alignment according to plant design. The inspectors also observed potential unmonitored release points and reviewed radiation monitoring system surveillance records and the routine processing and discharge of gaseous and liquid radioactive wastes.

Calibration and Testing Program (1 sample)

The inspectors reviewed gaseous and liquid effluent monitor instrument calibration, functional test results, and alarm setpoints based on National Institute of Standards and Technology calibration traceability and ODCM specifications.

Sampling and Analyses (1 sample)

The inspectors reviewed radioactive effluent sampling activities, representative sampling requirements, compensatory measures taken during effluent discharges with inoperable effluent radiation monitoring instrumentation, the use of compensatory radioactive effluent sampling, and the results of the inter-laboratory and intra-laboratory comparison program, including scaling of hard-to-detect isotopes.

Instrumentation and Equipment (1 sample)

The inspectors reviewed the methodology used to determine the radioactive effluent stack and vent flow rates to verify that the flow rates were consistent with TS/ODCM and UFSAR values. The inspectors reviewed radioactive effluent discharge system surveillance test results based on TS acceptance criteria. The inspectors verified that high-range effluent monitors used in emergency operating procedures are calibrated and operable and have post-accident effluent sampling capability.

Dose Calculations (1 sample)

The inspectors reviewed changes in reported dose values from the previous annual radioactive effluent release reports, several liquid and gaseous radioactive waste discharge permits, the scaling method for hard-to-detect radionuclides, ODCM changes, land use census changes, public dose calculations (monthly, quarterly, annual), and records of abnormal gaseous or liquid radioactive releases.

Problem Identification and Resolution (1 sample)

The inspectors evaluated whether problems associated with the radioactive effluent monitoring and control program were identified at an appropriate threshold and properly addressed in Salem's CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

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, 2016 through June 30, 2017.

- Common, Heat removal system (MS08)
- Common, Residual heat removal system (MS09)

To determine the accuracy of the performance indicator (PI) data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy

Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed PSEG's operator narrative logs, NOTFs, 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.

4OA2 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 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.

4OA6 Meetings, Including Exit

On October 10, 2017, the inspectors presented the inspection results to Mr. Charles McFeaters, Salem Vice President, and other members of the PSEG staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report. PSEG management indicated they may contest the NCV in Report Section 1R15.2.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
C. McFeaters, Salem Vice President
P. Martino, Plant Manager, Salem
T. Carucci, 12-Hr Maintenance Supervisor
R. DeNight, Engineering Director
J. Fleming, Director of Site Regulatory Compliance
J. Guinta, Systems Engineer
R. Heathwaite, REMP/REC Program Manager
D. Lynn, Mechanical Maintenance Supervisor
M. Maroles, Senior Reactor Operator
G. Morrison, Design Engineering
B. Muffley, Shift Operations Manager
T. Mulholland, Plant Engineering Senior Manager
T. Turek, System Engineer
J. Tutterow, System Engineer
J. Scull, Maintenance Director
J. Wearne, Compliance Manager
A. Zhang, Lead Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Open and Closed

05000272/2017003-01	NCV	Expiration of Periodic Inservice Testing of 14 Service Water Pump (Section 1R15.1)
05000272/2017003-02	NCV	Violation of Containment Integrity Technical Specification (Section 1R15.2)
05000272/2017003-03	NCV	Failure to Follow Maintenance Procedure to Assure Proper Installation of Service Water Check Valve (Section 1R22)

LIST OF DOCUMENTS REVIEWED

* Indicates NRC-identified

Section 1R01: Adverse Weather Protection

Procedures
OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 14
SC.OP-AB.ZZ-0001, Adverse Environmental Conditions, Revision 19
SC.OP-PT.ZZ-0002, Station Preparations for Seasonal Conditions, Revision 14
WC-AA-107, Seasonal Readiness, Revision 14
SC.MD-PM.ZZ-0036, Watertight Door Inspection and Repair, Revision 7

Notifications

20704888	20769517*	20771357*
20704978	20769518*	
20708365	20770715*	

Work Orders
30301872
30302998
60126201

Other Documents
IPEEE, VTDs 320758, 323042, and 320058
UFSAR, Sections 2.4 and 3.4
Focused Evaluation of External Floods for SGS Units 1 and 2, PSEG letter dated 6/30/17

Section 1R04: Equipment Alignment

Notifications
20773687*
20775216*
20772119

Drawings
223684, 2B Diesel Generator Engine Generator Control, Revision 36
223685, 1B & 2B Diesel Generators Alarms, Revision 16
223686, 1B & 2B Diesel Generator Unit Trip & Breaker Failure Protection, Revision 24
226632, Diesel Generators Protection and Control, Revision 11

Work Orders
30254228

Section 1R05: Fire Protection

Procedures
FP-SA-1141, Pre-Fire Plan Salem Unit 1 Turbine Building, Revision 0
FP-SA-2141, Pre-Fire Plan Salem Unit 2 Turbine Building, Revision 0
FP-SA-2651, Pre-Fire Plan Salem Unit 2 Service Water Intake Structure, Revision 0
SC.FP-SV.ZZ-0058, Inspection of Class 1 Fire Doors and Safety Related Areas for Transient Combustibles, Revision 22

Notifications

20770507*	20774498*	20775183*
20770520*	20774605*	20772154
20772737*	20776151*	

Section 1R11: Licensed Operator Requalification Program

Procedures
2-EOP-LOCA-3, Transfer to Cold Leg Recirculation, Revision 31
2-EOP-LOCA-1, Loss of Reactor Coolant, Revision 30
2-EOP-LOSC-2, Multiple Steam Generator Depressurization, Revision 31
2-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 32

Notifications
20774803*
20774804*
20774911*

Other Documents
Scenario Guide ESG-A301
Scenario Guide ESG-A303

Section 1R12: Maintenance Effectiveness

Notifications

20606407	20774903*	20772312
20607099	20777124	20772314
20771900*	20774649	20771840
20771917*	20774650	20770295
20774408*	20772312	20766832

Work Orders

30151474	60104541	70153482
30208976	60135986	

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
Testing/Inspection, Revision 17
OP-AA-108-116, Protected Equipment Program, Revision 12
S2.OP-SO.DG-0002, 2B Diesel Generator Operation, OTSC 38A S2.OP-ST.DG-0002, 2B Diesel Generator Surveillance Test, OTSC 51A
SC.MD-FT.DG-0001, Emergency Diesel Generator Field Flashing Relay K1C
WC-AA-105, Work Activity Risk Management, Revision 6

Notifications

20606407	20771143	20774092*
20607099	20771219	20774193*
20635535	20771386*	20774593*
20689438	20771387*	20775330*
20769376*	20771396*	

Work Orders

30151474	60120347	70153482
30208976	60125811	70162247
60104541	60135986	

Other Documents
Operations Narrative Logs for July 25, 2017
PSE-99233, Failure Analysis of K1C Field Flash Relay, dated 28 February 2014
Unit 1 risk assessment for work weeks 730 and 732

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
EP-AA-121-1003, Equipment Important to Emergency Response – Work Prioritization, Revision 3
LS-AA-104-1000, 50.59 Resource Manual, Revision 8
MA-AA-716-210, Preventive Maintenance (PM) Program, Revision 10
MA-AA-716-210-1005, Predefine Change Processing, Revision 7
OP-AA-108-103, Locked Equipment Program, Revision 4
OP-AA-108-103-1001, Locked Equipment Program, Revision 1
OP-SA-108-115-1001, Operability Assessment and Equipment Control Program, Revision 10
S1.CH-AB.CBV-1076, Unit 1 Containment Atmosphere Sampling Under Accident Conditions, Revision 0
S1.CH-AB.CBV-1243, Unit 1 Containment Atmosphere Sampling, Revision 1
S1.OP-ST.CAN-0001, Primary Containment Valves Monthly, Revisions 12 and 13
S1.OP-ST.CAN-0002, Inside Containment Valve Verification Modes 1-4, Revision 3
S2.OP-LR.MP-0001, Type B Mechanical Penetration Leak Rate Testing, Revision 1
SC.OP-AB.ZZ-0004, Earthquake, Revision 2

Notifications

20759443	20772465	20715581*
20771139	20772467	20672535
20774499*	20771321	20712428*
20775815*	20772906	20710999
20776222*	20770576	20714946
20776155*	20771219	20706526
20776775*	20771143	20706527
20777736	20751413*	20706785
20772751	20751688*	20695345
20772751	20777663*	20705558
20768780	20712428	20672533
20771376	20715581	20663402
20774437	20714946	20663402

Drawings
201193, Unit 1 and 2 Reactor Containment Equipment Hatch and Personnel Locks
205238, Unit 1 Reactor Containment – Ventilation, Sheet 1, Revision 38
208070, Unit 1 – Containment Area Shielding and Heavy Equipment Handling Plan, Sheet 1, Revision 10
201193, Units 1 and 2 – Reactor Containment Equipment Hatch and Personnel Locks, Revision 11
219508, Yard, Salem Roadways and Finished Grading, Sheet 1, Revision 54
223684, 2B Diesel Generator Engine – Generator Control, Sheet 2, Revision 36
223685, 1B and 2B Diesel Generators, Alarms, Revision 16
223686, 1B and 2B Diesel Generators, Unit Trip and Breaker Failure Protection, Revision 24
226632, Units 1 and 2 – Diesel Generators Protection and Control, Revision 11

252312, Salem and Hope Creek Yard Master Site Plan – Temporary Facilities, Sheet 1, Revision 9
601232, 1B 460V Vital Bus One-Line, Revision 18
601669, Units 1 and 2 General Building Room Locations, Revision 4

Work Orders

40025088	70178637	70192466
60134574	70183531	80112838
60135562	70191433	80119985

Other Documents

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Notifications
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LIST OF ACRONYMS

10 CFR	Title 10 of the *Code of Federal Regulations*
ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
APD	air particulate detector
ASME	American Society of Mechanical Engineers
AST	alternate source term
C/A	corrective action
CAP	Corrective Action Program
CCW	component cooling water
CFCU	containment fan cooling unit
CFR	*Code of Federal Regulations*
CIV	containment isolation valve
DCP	design change package
D/P	differential pressure
EDG	emergency diesel generator
EOP	emergency operating procedure
ERE	equipment reliability evaluation
HX	heat exchanger
IMC	inspection manual chapter
IR	inspection report
IST	inservice test
LCO	limiting condition for operation
LERF	large early release frequency
LOCA	loss of coolant accident
LOOP	loss of offsite power
MELB	Moderate Energy Line Break
MR	maintenance rule
NCV	non-cited violation
NEI	Nuclear Energy Institute
NOTF	notification
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
ODCM	off-site dose calculation manual
OM	operations and maintenance
OOS	out of service
OpEval	Operability Evaluation
PI	performance indicator
PM	preventive maintenance
PSEG	Public Service Enterprise Group Nuclear LLC
ROP	Reactor Oversight Process
RTP	rated thermal power
RWP	radiation work permit
SDP	significance determination process
SLIV	severity level IV
SR	surveillance requirement
SSC	structure, system, and component
SW	service water
SWIS	service water intake structure

TE	technical evaluation
TRM	technical requirements manual
TS	technical specification(s)
UFSAR	Updated Final Safety Analysis Report
UT	ultrasonic testing
WO	work order