



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

September 12, 2016

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

**SUBJECT: SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2 – EVALUATION
OF CHANGES, TESTS, AND EXPERIMENTS AND PERMANENT
MODIFICATIONS TEAM INSPECTION REPORT 05000272/2016007 AND
05000311/2016007**

Dear Mr. Sena:

On August 5, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Salem Nuclear Generating Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on August 5, 2016, with Mr. Eric Carr, Site Vice President (Acting), and other members of your staff.

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

Based on the results of this inspection, no findings were identified.

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

P. Sena

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Sincerely,

/RA/

Paul G. Krohn, Chief
Engineering Branch 2
Division of Reactor Safety

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

Enclosure:
Inspection Report 05000272/2016007 and 05000311/2016007
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos. 50-272 and 50-311

License Nos. DPR-70 and DPR-75

Report Nos. 05000272/2016007 and 05000311/2016007

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Salem Nuclear Generating Station, Units 1 and 2

Location: Hancocks Bridge, NJ

Inspection Period: July 18 through August 5, 2016

Inspectors: J. Kulp, Senior Reactor Inspector, Team Leader
J. Brand, Reactor Inspector
C. Jones, Reactor Inspector

Approved By: Paul G. Krohn, Chief
Engineering Branch 2
Division of Reactor Safety

SUMMARY OF FINDINGS

Inspection Report 05000272/2016007 and 05000311/2016007; 07/18/2016 - 08/05/2016; Salem Nuclear Generating Station (Salem), Units 1 and 2; Engineering Specialist Plant Modifications Inspection.

This report covers a 2-week inspection of the evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by three region based engineering inspectors. The U.S. Nuclear Regulatory Commission's (NRC's) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

No findings were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (IP 71111.17)

.1 Evaluations of Changes, Tests, or Experiments (29 samples)

a. Inspection Scope

The team reviewed seven safety evaluations to evaluate whether the changes to the facility or procedures, as described in the Updated Final Safety Analysis Report (UFSAR), had been reviewed and documented in accordance with Title 10 of the *Code of Federal Regulations* (CFR) Part 50.59 requirements. In addition, the team evaluated whether Salem had been required to obtain NRC approval prior to implementing the changes. The team interviewed plant staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, technical specifications, and plant drawings to assess the adequacy of the safety evaluations. The team compared the safety evaluations and supporting documents to the guidance and methods provided in Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," as endorsed by NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," to determine the adequacy of the safety evaluations.

The team also reviewed 22 samples of 10 CFR 50.59 screenings for which Salem had concluded that a safety evaluation was not required to be performed. These reviews were performed to assess whether Salem's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample included design changes, calculations, and procedure changes.

The team reviewed the safety evaluations that Salem had performed and approved during the time period covered by this inspection (i.e., since the last plant modifications inspection) not previously reviewed by NRC inspectors. The screenings and applicability determinations were selected based on the safety significance, risk significance, and complexity of the change to the facility.

In addition, the team compared Salem's administrative procedures used to control the screening, preparation, review, and approval of safety evaluations to the guidance in NEI 96-07 to evaluate whether those procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations and screenings are listed in the Attachment.

b. Findings

No findings were identified.

.2 Permanent Plant Modifications (10 samples)

.2.1 Unit 1 Auxiliary Building External Flood Seal Enhancement - Room 15417

a. Inspection Scope

The team reviewed modification design change package (DCP) 80017999 which installed internal conduit seals to control minor ground water leakage into the 84' elevation of the Unit 1 Auxiliary Building through three conduits located in the containment spray pump area (Room 15417). The three conduits are 3" diameter conduits and contain the 4160 V power cables to safety-related service water pumps 15 and 16, and a 460 V power cable to a non-vital motor control center at the Salem service water intake structure.

The team reviewed the modification to determine if the design, licensing bases, and performance capability of the service water pumps and the containment spray pump area had been degraded by the modification. The team reviewed calculations, licensee design documents, submerged cables program test reports, and associated maintenance work orders to determine if the changes were appropriately implemented. The team also performed independent field walkdowns and inspections of all three flood seals to determine if the seals configuration was in accordance with the installation requirements and to verify the condition of the seals. Additionally, the team interviewed design and system engineers to determine if the changes met design and licensing requirements. Finally, the 10 CFR 50.59 screening associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.2 Increase Unit 1 and Unit 2 Positive Displacement Pump Discharge Relief Valve CV141 Set Pressure to 2825 PSIG

a. Inspection Scope

The team reviewed modification DCP 80099537 which modified the pressure relief set point on the Unit 1 and Unit 2 charging system positive displacement pumps from 2735 psig to 2825 psig. The relief valves are in the chemical and volume control system (CVCS) and provide overpressure protection for the 13 and 23 charging pumps. This modification was implemented to address repeated relief valve failures due to valve wear caused by the lift set pressure being set close to the maximum operating pressure of the pumps.

The team reviewed the modification to determine if the design, licensing bases, and performance capability of the Unit 1 and Unit 2 charging pumps, the associated piping, and the CVCS had been degraded by the modification. The team reviewed calculations, licensee design documents, test reports, and associated maintenance work orders to determine if the changes were appropriately implemented. A review of corrective action program reports was performed to evaluate whether there were any reliability or performance issues associated with the Unit 1 and 2 CVCS. Finally, the team

interviewed design and system engineers to determine if the changes met design and licensing requirements. The 10 CFR 50.59 screening associated with this modification was reviewed as described in section 1R17.1 of this report. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.3 Salem Motor-Operated Valve Motor Replacement – 21SJ44 and 24SJ54

a. Inspection Scope

The team reviewed modification DCP 80102513 which replaced magnesium rotor motors with aluminum rotor motors in the Limitorque actuators for motor-operated valves 21SJ44 and 24SJ54. The two valves are the 21 residual heat removal (RHR) pump containment sump suction isolation valve (21SJ44) and the safety injection accumulator isolation valve (24SJ54). These replacements are part of a systematic industry effort to replace all magnesium rotors due to rotor corrosion on the collector ring and end ring of magnesium rotors. The team focused the inspection on the penetration seals associated with this modification, and their capability to perform their safety-related function of a flood and fire barrier. The motor changes also required changing the thermal overload heater at the respective motor control centers.

The team reviewed the modification to determine if the design, licensing bases, and performance capability of the RHR system and the safety injection accumulator were not degraded by the modification. The team reviewed calculations, design documents, test reports, and associated maintenance work orders to determine if the changes were appropriately implemented. A review of corrective action program notifications was also performed to evaluate whether there were any reliability or performance issues associated with the RHR system and the safety injection accumulator. Additionally, the team interviewed the Salem motor-operated valve program owner, and design and system engineers to determine if the changes met design and licensing requirements. Finally, the 10 CFR 50.59 screening associated with this modification was reviewed as described in section 1R17.1 of this report. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.4 Unit 1 and Unit 2 Component Cooling Heat Exchanger and Diesel Cooling Controller Replacement

a. Inspection Scope

The team reviewed modification DCP 80111212 which replaced existing Moore pneumatic cascading temperature and flow controllers and differential pressure controllers with pneumatic Foxboro controllers. The cascaded temperature and flow controllers were used to control service water flow through the 11, 21, and 22 component cooling water heat exchangers (CCHXs) and the differential pressure

controllers were used to control service water flow through the 1A, 1B, 1C, 2A, 2B, and 2C emergency diesel generator (EDG) jacket water lubricating oil coolers. This modification was implemented because the existing Moore controllers were obsolete and failure of the controller could affect the operability of several safety-related components.

The team reviewed the modification to determine if the design, licensing bases, and performance capability of the CCHX and EDGs had been degraded by the modification. The team reviewed calculations, licensee design documents, test reports, and associated maintenance work orders to determine if the changes were appropriately implemented. A review of corrective action program notifications was also performed to evaluate whether there were any reliability or performance issues associated with the component cooling water system and associated CCHXs and the EDGs following the modification. Finally, the team interviewed design and system engineers to determine if the changes met design and licensing requirements. Additionally, the 10 CFR 50.59 screening associated with this modification was reviewed as described in section 1R17.1 of this report. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.5 Advanced Digital Feed Control System

a. Inspection Scope

The team reviewed modification DCP 80104782 that replaced an obsolete digital feedwater control system with a new advanced digital feedwater control system based on the Emerson Ovation distributed control system platform. The modification scope included installation of new processor racks, cabinets, work stations, and control room hardware for control and monitoring of steam generator pump speed, feedwater flow regulating valve position, and operation of steam system atmospheric relief valves. Software changes included modifications to the gains for steam generator level control, the control algorithm for steam flow - feed flow mismatch, and the basis and method for feed pump control.

The team assessed whether the modification was consistent with the design and licensing bases and applicable system requirements. The team conducted interviews with the responsible system engineer, operations personnel, and training personnel. Walkdowns were performed to examine the hardware installations in the control room, the control equipment room, and the training simulator. The team also reviewed results from post-modification testing of the software and affected components to verify testing demonstrated proper control and operation in accordance with defined acceptance criteria. The team also evaluated whether affected plant procedures, training, calculations, and drawings were properly updated. Finally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.6 Salem Unit 2 FLEX Electrical Connections

a. Inspection Scope

The team reviewed modification DCP 80110421 that installed new electrical connection points and associated distribution systems in order to implement diverse and flexible coping strategies (FLEX) for beyond-design-basis external events. The FLEX modifications were designed to maintain the station in a safe condition following an extended loss of alternating current (AC) power concurrent with a loss of normal access to the ultimate heat sink. The DCP provided electrical power modifications to maintain core cooling and heat removal, maintain reactor coolant system inventory control, maintain primary containment, and maintain spent fuel pool cooling during an extended loss of AC power event. Added items included a combination of permanently installed station power distribution equipment, permanently installed FLEX power distribution equipment, and specialized portable cables used to distribute power from the FLEX generators.

The team assessed whether the modification was consistent with the design and licensing bases and operational requirements. The team conducted interviews with responsible engineers and operations personnel, and walked down hardware installations in the auxiliary building, turbine building, and the outdoor "Canyon" area. The team also evaluated whether affected plant procedures, calculations, and drawings were properly updated. Finally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.7 Changing Diesel Generator Area CARDOX from Auto to Manual

a. Inspection Scope

The team reviewed modification DCP 80115237 that reconfigured the actuation scheme for the carbon dioxide (CO₂) fire suppression systems in the diesel generator areas. The change removed the existing automatic injection of CO₂ in response to sensed fires and maintained the capability for manual system actuation. The modification addressed a concern that when in auto mode, the system represented a life safety hazard for people in the areas if the system were to inadvertently discharge via its automatic function. Salem engineers determined the removal of the automatic system actuation conformed to applicable fire system standards and did not present an adverse impact to the capability to achieve safe plant shutdown.

The team assessed whether the modification was consistent with the design and licensing bases and fire protection program requirements. The team conducted interviews with a responsible engineer and walked down hardware installations in the diesel generator area vestibule, diesel generator local control rooms, and vicinity of the oil storage and transfer pumps. The team reviewed results from post-modification testing of the modified system to verify required functions performed correctly in response to manual actuations. The team also evaluated whether affected plant

procedures, calculations, drawings, and license documents were properly updated. Finally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.8 Pressurizer Heaters Power Supply Upgrade

a. Inspection Scope

The team reviewed modification DCP 80095831 that addressed an issue with nuisance breaker trips in circuits providing electrical power to the pressurizer heaters. The existing molded case circuit breakers were drawing more than 80 percent of rating and the panel ventilation system did not have sufficient capacity to prevent overheating problems. In addition, the design of components in the pressurizer heater panel required strengthening to provide adequate short circuit withstand capability for analyzed peak currents. The modification replaced the breakers with fused disconnect switches contained in a larger panel that was designed to alleviate buildup of excessive heat. Internal panel components were braced to withstand the effects of analyzed fault currents.

The team assessed whether the modification was consistent with the design and licensing bases and operational requirements. The team conducted interviews with the responsible engineers and walked down hardware installations in the electrical penetration room. The team also evaluated whether affected plant procedures, calculations, and drawings were properly updated. Results of post-modification monitoring and evaluations were evaluated to verify the design intent was met. Finally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.9 Salem Unit 2 FLEX Mechanical Modifications

a. Inspection Scope

The team reviewed modification DCP 80110419 that installed new mechanical connections for portable pumps in existing safety system piping in order to implement FLEX for beyond-design-basis external events. The FLEX modifications were designed to maintain the station in a safe condition following an extended loss of AC power concurrent with a loss of normal access to the ultimate heat sink. The DCP installed additional valves and piping modifications so that portable pumps could be rapidly installed in existing safety systems to maintain core cooling and heat removal capabilities, reactor coolant system inventory control capabilities, and spent fuel pool cooling during an extended loss of AC power event.

The team assessed whether the modification was consistent with the design and licensing bases and operational requirements. The team conducted interviews with responsible engineers and operations personnel, and walked down hardware installations in the auxiliary building and the turbine building. The team also evaluated whether affected plant procedures, calculations, and drawings were properly updated. Drawings, procedures, and training lesson plans were reviewed to verify that they were properly updated to reflect the post-modification configuration. The team reviewed the completed American Society of Mechanical Engineers non-destructive testing performed following installation of the new piping in the existing systems. Finally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.10 Revise Unit 1 Turbine Overspeed Protection Setpoint

a. Inspection Scope

The team reviewed DCP 80106289 which raised the digital electro-hydraulic control turbine overspeed protection setpoint from 103 percent to 108 percent in order to lower the system's sensitivity to spurious overspeed trips. The DCP also implemented a Woodward service bulletin to install jumper wires across all unused speed input terminals to eliminate the possibility of inadvertent turbine trips due to stray electromagnetic signals.

The team assessed whether the modification was consistent with the design and licensing bases and operational requirements. The team assessed Salem's technical evaluations and design details to evaluate whether the digital electro-hydraulic control system would function to protect the turbine as designed and as described in the UFSAR. The team reviewed industry studies and standards to assess whether the assumptions made in those studies regarding system testing and periodic non-destructive evaluation of the turbine assembly were addressed during the generation of the DCP. Drawings, procedures, and training lesson plans were reviewed to verify that they were properly updated to reflect the post-modification configuration. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in Section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES4OA2 Identification and Resolution of Problems (IP 71152)a. Inspection Scope

The team reviewed a sample of notifications associated with 10 CFR 50.59 and plant modification issues to evaluate whether PSEG was appropriately identifying, characterizing, and correcting problems associated with these areas, and whether the planned or completed corrective actions were appropriate. In addition, the team reviewed notifications written on issues identified during the inspection to verify adequate problem identification and incorporation of the issues into the corrective action system. The notifications reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

The team presented the preliminary inspection results to Mr. Eric Carr, Site Vice President (Acting), and other members of Salem staff at a meeting on August 5, 2016. The team returned proprietary information reviewed during the inspection and verified that this report does not contain proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

E. Carr, Site Vice President (Acting)
K. Grover, Plant Manager
J. Mallon, Site Compliance Director
S. Marcos, Design Engineering Director
M. Adair, Fire Protection
R. Andersen, Equipment Operator
R. Cordrey, Operations Support Manager
H. Flores, Electrical Design Engineer
E. Gallagher, Instructor
K. Moore, Instructor
R. Page, System Engineer
D. Pino, Electrical Design Engineer
D. Shaver, Training Coordinator
M. Adair, Fire Protection Program Engineer
S. Boesch, System Engineer
E. Castillo, Design Engineer
E. Ciemiewicz, Motor Operated Valves Engineer
B. Cordre, Operations Support
R. Denardi, Motor Operated Valves Engineer
B. Down, Senior Design Engineer
J. Dugan, Engineering Response Team Design Engineer
M. Halterken, Maintenance Service Superintendent
B. Henriksen, Engineering Response Team Branch Manager
K. King, Senior Design Engineer
D. Kolasinski, System Engineer
J. Leopardi, Site Facilities Manager
G. Morrison, Principal Design Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

10 CFR 50.59 Evaluations

S2013-176, Salem 2 Advanced Digital Feedwater Control System (ADFCS) Upgrade,
Revision 0
S2014-183, Salem Unit #2 Main Generator Automatic Voltage Regulator (AVR) Replacement,
Revision 0
S2015-186, Salem 1 Advanced Digital Feedwater Control System (ADFCS) Upgrade,
Revision 0
S2014-162, DCR 80112753, Unit 1, Polar Crane Rail Anchorage Repair Alternate-Drawing
210543, Revision 0
S2015-369, DCR 80114274, Removal of Containment Shadow Shields (S2015-369), Revision 0
S2016-020, ECP 80116362, NSAL 14-5 Implementation, Revision 0

S2016-046, ECP 80110933 and 80110935, Unit 2 Fuel Transfer System and Manipulator Crane Upgrade, Revision 0

10 CFR 50.59 Screened-out Evaluations

S2008-206, Upgrade Electrical Power Supply to Pressurizer Heaters, Revision 0

S2014-164, Camera Installation for Remote Monitoring Reactor Coolant Pump Platform Areas, Revision 1

S2015-024, Salem Unit 2 FLEX Electrical Connections, Revision 0

S2015-349, 125 VDC Ground Detection Procedure, Revision 0

S0216-029, 125 VDC Ground Detection Procedure, Revision 0

S2016-076, Abnormal Grid, Revision 0

70178658-0260, 50.59 and Fire Protection Regulatory Review for SCN 15-016, dated 08/24/2015

S2014-144, Units 1 and 2 Component Cooling Heat Exchanger and Diesel Cooling Controller Replacement, Revision 0

S2015-400, SC.OP-AM.FLX-0050, Predicted Hurricane Storm Surge, Revision 0

S2015-499, Revision of UFSAR 6.3.2 High Head SI Pump Minimum Flow, Revision 0

S2016-059, Containment Sump Project Calculation Revisions, Revision 0

S2016-083, Nonconformance of Non-Safety Related Lubricants in Safety Related Components, Revision 0

S2015-001, DLRA Commitment Tracking – Salem, “S2.OP-SO.SW-0008(Q), In Service Room Cooler Flushes, Revision 2”, dated 01/08/15

S2007-245, Salem Unit 2 MIMS (Metal Impact Monitoring System Sensor Upgrade), dated 10/03/07

S2015-031, Salem Unit 2 FLEX Mechanical Modifications, Revision 0

S2012-077, Increase Main Turbine Overspeed Setpoint, Revision 1

S2015-100, Changes to procedure S1&S2.OP-SO.CVC-0006 Boron Concentration Control, Revision 0

S2016-034, Changes to procedure S1.OP-SO.CVC-0002 Charging Pump Operation, Revision 0

S2016-128, NUCR/70185982 Mini-Mode Ops Test 13SJ54, Revision 0

80017999, Auxiliary Building External Flood Seals, Revision 0

S2015-345, Increase Unit 1 and 2 PDP Discharge Relief Valve CV141 Set Pressure to 2825 PSI, Revision 0

S2011-028, Salem MOV Motor Replacement 21SJ44 and 24SJ64, Revision 0

Modification Packages

80095831, Unit 2 Pressurizer Heaters Power Supply Upgrade, Revision 3

80104782, Salem 1 Advanced Digital Feedwater Control System (ADFCS) Upgrade, Revision 2

80110421, Salem Unit 2 FLEX Electrical Connections, Revision 0

80115237, Changing Diesel Generator Area Cardox from Auto to Manual, Revision, Revision 0

80099537, Increase Units 1 and 2 PDP Discharge Relief Valve CV141 Set Pressure to 2825 psig, Revision 1

80102513, Salem Unit 2 MOV Motor Replacement, 21SJ44 and 24SJ54, Revision 0

80111212, Units 1 and 2 Component Cooling Heat Exchanger and Diesel Cooling Controller Replacement, Revision 1

80017999, Auxiliary Building External Flood Seals Enhancement, Revision 0

80106289, Revise Unit 1 Turbine Overspeed Protection Setpoint, Revision 1

80110419, Salem Unit 2 Mechanical Connections (FLEX), Revision 1

Calculations, Analysis, and Evaluations

70178658-0260, GL 86-10 Evaluation for Converting the Automatic CO2 Fire Suppression Systems in Salem Diesel Generator Areas to Manual Operation, dated 09/09/2015

ES-7.016, Rev. 1, FLEX 4kV Generator Protective Relay Calculation – Salem 1 & 2, dated 08/25/2015
 ES-13.005, Rev. 9, Unit 2 Electrical Penetration Protection, dated 04/16/07
 ES-15.009 E29, Rev. 0, Essential Controls Inverter Load Study for PSEG SNGS Units 1 & 2
 ES-15.019, FLEX Electrical System Analysis – Salem 1 & 2, Revision 1
 S-2-CAV-MDC-1783, Rev. 1, Maximum Temperatures in Areas Served by SPAVS, dated 11/22/00
 SC-CN006-01, Salem Unit 1 & 2 Feedwater Flow Scaling Calculation, Revision 8A
 WNA-AR-00398-PSE, Salem Units 1 and 2 Feedwater Control System Upgrade Failure Modes and Effects Analysis, Revision 0
 E-T232 Maximum Thrust and Seismic Analysis for Public Service Electric and Gas, Salem Units 1&2, Revision A
 ES-18.006(Q), Selection of TOL Heater Elements Unit 1 & 2 Safety Related MOV's, Revision 2
 21SJ44 (SGS-2), MIDACALC AC Motor Operated GL 96-05 Gate Valve, Revision 4
 NC-6242, 21 CCP Performance Test, Revision 1, dated 08/28/12
 ND.DE-SP.ZZ-0002(Q), Pressure Test of Silicone Foam With and Without Silicone Caulk in a 6 Inch Diameter Rigid Steel Conduit With Cable Penetrants, Concrete Liquid in a 4 Inch Diameter Rigid Steel Conduit With Cable Penetrants, Silicone Foam in a 12 Inch Diameter Opening With a Pipe Penetrant, and Arlon Utility Blue Black Fabric Over a 12 Inch Diameter Opening With a Pipe Penetrant, Revision 0
 NQ-6109, 22 CCP Performance Test, Revision 1, dated 05/17/11
 S-C-CVC-MDC-2348, CVCS Discharge Header Overpressure Protection Report, Revision 2
 S-C-FBR-ZZEE-0317-1, Design Requirements for Concrete and Grout Seal Details, dated 09/06/91
 S-C-ZZ-MDC-2005, Hope Creek CR Habitability for LOCA Occurring at Salem 2 Plant, Revision 2
 S-C-ZZ-MEE-1934, Post-LOCA Doses With Equipment Hatch Outer Concrete Blocks Removed in Mode 1, Revision 0
 S-C-ZZ-MDC-1945, Post LOCA EAB, LPZ, & CR Doses-Alternative Source Term (AST), Revision 4
 6SO-0803, Check Penetration Seal Stresses for Grout & Concrete Seals-Salem 1 & 2, Revision 0
 0108-1408-0445, Evaluation of Outer Equipment Hatch of Salem Units 1 and 2 Containment for the Effects of a Tornado Missile, Revision 1
 567572, Auxiliary Feedwater Piping, Revision 3
 567391, Safety Injection Piping, Revision 7
 6S2-2375, Cut Rebar Evaluation Auxiliary Building, Elevation 136'-11", Revision 0
 2A-CVCG-5256, Design Calculation for 2A-CVCG-5256, Revision 0
 CT-27336, Siemens Technical Report: Missile Probability Analysis PSEG Nuclear LLC Salem Unit 1, Revision 1
 WCAP-11525, Probabilistic Evaluation of Reduction in Turbine Valve Test Frequency, dated 06/1987

Notifications (Condition Reports)

20551880	70182785	20716170	20715226	20716321	20695058
20724215	20731204	20717191	20701298	20701296	20701366
20704244	70169697	20693432	20672695	20672525	20672407
20664803	20649044	20649213	20729308	20728916	20728915
20729044	20736802	20636551	20710653	20735868	20736082*
20736084*	20736695	20736792	20737197*	20737361*	
NUCR 70088066	NUCR 70087762		NUCR 70126271	NUCR 70155885	
AR 970821253					

(* denotes NRC identified during this inspection)

Drawings

601397 B 9535, Salem Nuclear Generating Station No. 2 Unit – Aux. Bldg. Penetration Area 2EP-480V Pressurizer Htr. Bus One-Line Diagram, Revision 15
 601398 B 9535, Salem Nuclear Generating Station No. 2 Unit – Aux. Bldg. Elec. Penetration Area 2GP-480V Pressurizer Htr. Bus One Line Diagram, Revision 12
 604994, Salem Unit 2 Master Fuse List, Revision 1
 80110421R0 SUP01, Salem Unit 2 Phase 2 480V FLEX Power Master Diagram, Revision 1
 80110421R0 SUP02, Salem Unit 2 Phase 2 230V FLEX Power Master Diagram, Revision 2
 205228A8761, PI&D Chemical & Volume Control Operation, Sheet 2, Revision 85
 205234A8761, PI&D Safety Injection, Sheet 1, Revision 59
 601227, No. 2 Unit – Turbine Generator Turbine Trip Back-up, Sheet 1, Revision 14
 205336, No. 2 Unit – Auxiliary Feedwater, Sheet 1, Revision 53
 205328, No. 2 Unit – Chemical Volume and Control Operation, Sheet 2, Revision 70
 205334, No. 2 Unit – Safety Injection, Sheet 1, Revision 61
 205334, No. 2 Unit – Safety Injection, Sheet 2, Revision 57

Licensing Documents

SCN 14-007, UFSAR Section 7.7 Upgrade of Advanced Digital Feedwater Control System, dated 10/01/14
 SCN 15-016, UFSAR Sections 8.1 and 9.5 fire protection and combustible materials, dated 09/15/16
 Regulatory Guide 1.106, Thermal Overload Protection for Electric Motors on Motor-Operated Valves, Revision 2
 NUREG-2101, Safety Evaluation Report Related to the License Renewal of Salem Nuclear Generating Station, Docket Numbers 50-272 and 50-311, dated 06/2011
 Unit 1 and 2 Technical Specifications, Revision 28
 Salem Nuclear Generating Station Unit 1 and 2 UFSAR, Revision 28
 SH-PBD-AMP-XI.M20, Program Basis Document: Open-Cycle Cooling Water Program, Revision 3
 Regulatory Guide 1.115, Protection Against Turbine Missiles, Revision 2

Procedures

S1.OP-ST.MS-0002(Q), Inservice Testing Main Steam and Feedwater Valves, Revision 15
 S1.RA-ST.MS-0002(Q), Inservice Testing Main Steam and Main Feedwater Valves Acceptance Criteria, Revision 13
 S2.IC-CC.RCP-0056(Q), 2FT-540 #24 Steam Generator Feedwater Flow Channel I, Revision 11
 SC.IC-FT.CN-0001(Q), ADFCS Functional Test, Revision 2
 WNA-TP-04822-PSE, Application Software Test Guideline
 1RCP092E-PC, Calibration of Emergency Diesel Generator SST-2000 Series Speed Switch, Revision 0
 SC.OP-AM.FLX-0050(Z), Predicted Hurricane Storm Surge, Revision 0
 SC.OP-PM.FLX-0002(Z), Flex Equipment Inventory, Revision 0
 SH.OP-AM.FLX-0050, Pre-Storm Storage and Protection of Outdoor Flex Equipment, Revision 0
 S2.OP-SO.SW-0008(Q), In Service Room Cooler Flushes, Revision 2
 S2.OP-SO.SW-0008(Q), In Service Room Cooler Flushes, Revision 1
 ER-AA-240, GL 89-13 Program Implementing Procedure, Revision 5
 LS-AA-104-1000, 50.59 Resource Manual, Revision 8
 S1.IC-CC.EHC-0002(Z), Turbine EHC System Overspeed Protection, Revision 9
 S1.OP-PT.TRB-0004(Q), Main Turbine Overspeed Test, Revision 9
 S1.OP-PT.TRB-0001(Q), Turbine Auto Trip Mechanism Operational Test, Revision 27

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

Work Orders

60122071	60122070	30231578	30286152	60082137	60082172
60082237	60082260	60096552	60107652		

Miscellaneous

DCP 80104783 Energized MAT, Salem Unit 2 Advanced Digital Feedwater Control System Upgrade Energized Test Plan, completed 10/14/15

DCP 80104783 Power Ascension Test, Salem Unit 2 Advanced Digital Feedwater Control System Upgrade Power Ascension Test Procedure, completed 12/03/15

NOS05ODFWCS-00, Ovation Advanced Digital Feedwater Control System, dated 10/09/15

S1.FP-ST.FS-0021, Rev. 11, Diesel Area CO2 Systems Operability and Partial Discharge Test, completed 01/14/16

S-RSG-091, Simulator Training Scenario for Abnormal Grid with Stuck Rod, Loss of "B" 4kV Bus, and Loss of Heat Sink, Revision 1

S-SG-2008B, Simulator Training Scenario for Secondary Plant Startup Using Ovation, Revision 0

WNA-TP-04833-PNJ, Salem Unit 2 Feedwater Control System Upgrade Phase 4 Factory Acceptance Test Procedure, Revision 1, completed 03/05/15

WNA-TR-03215-PSE, Salem Units 1 and 2 Feedwater Control System Upgrade Application Software Test Report, Revision 0

WNA-TR-03217-PNJ, Salem Unit 2 Feedwater Control System Upgrade Phase 1 Factory Acceptance Test Procedure, Revision 0, completed 03/17/15

WNA-TR-03219-PNJ, Rev. 0, Phase 2-4 Factory Acceptance Test, completed 03/18/2015

WNA-TP-04836-PNJ, Rev. 0, Graphics Test Procedure, completed 03/23/2015

Chemical Item Classification Permit (CICP) 0200-0053, BISCOSEAL TC-28, dated 03/24/97

Chemical Item Classification Permit (CICP) 0200-0054, BISCOSEAL TC-33, dated 01/19/01

Chemical Item Classification Permit (CICP) 0200-1281, CONGRESIVE Liquid Seal, dated 04/28/98

Salem Units 1 and 2 Charging Pumps Vibration Trends last 3 years

NLR-N88126, Response to NRC Bulletin 88-04, dated 12/06/1988

NLR-N89203, Response to NRC Bulletin 88-04, dated 08/11/1989

NLR-N90172, Response to NRC Bulletin 88-04, dated 08/31/1990

NLR-N92047, Response to NRC Bulletin 88-04, dated 05/29/1992

NLR-N93106, Response to NRC Bulletin 88-04, dated 08/06/1993

NLR-N93187, Response to NRC Bulletin 88-04, dated 12/06/1993

NRC Inspection Report 05000272/2008007 and 05000311/2008007, Dated 09/22/08

Pacific 2-1/2 RL-IJ 11-Stage Charging Pump Installation, Operation and Maintenance, Revision 2

6Y 1SWE5-MTRD, VLF TAN-DELTA Testing of SW Power Cables, dated 12/18/13

6Y 1SWE6-MTRD, VLF TAN-DELTA Testing of SW Power Cables, dated 02/21/14

EM-SA-100-1000, Response to Beyond Design Basis External Events Program Document Salem Generating Station, Revision 0

70136308, Root Cause Evaluation: Unit 2 Turbine Trip resulted in a Reactor Trip, dated 07/09/12

SCN 12-009, UFSAR Change Request For Turbine Protection and Accidents, dated 05/25/12

1600125.403, Nondestructive Examination and Evaluation LP Turbine Rotor Shrunk-On Disk and L-0 Blade Root Inspections Salem Generating Station Unit No.1 June 2016, Revision 0

1600125.402, Nondestructive Examination and Evaluation Unit No. 1 LP-B Rotor Periphery NDE PSEG Salem Generating Station June 2016, Revision 0

NOS05Flex-00, EOP-LOPA-4 & Flex Support Guidelines, dated 03/31/15
70186758, Check In Self-Assessment, Design Basis Understanding and Maintenance, Dated
05/13/16

Completed Tests

S1.OP-PT.HSD-002(Q), Hot Shutdown Panel/Local Panel Functional Test, completed 10/24/14
S2.OP-PT.HSD-002(Q), Hot Shutdown Panel/Local Panel Functional Test, completed 10/24/15
S2.OP-ST.SJ-0004(Q), In-service Testing Safety Injection Valves Modes 3-6, completed
10/31/15
S2.OP-ST.SJ-0005(Q), In-service Testing Safety Injection Valves Modes 5-6, completed
11/09/15

LIST OF ACRONYMS

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
AC	Alternating Current
CCHX	Cooling Water Heat Exchanger
CVCS	Chemical and Volume Control System
DCP	Design Change Package
EDG	Emergency Diesel Generator
FLEX	Diverse and Flexible Coping Strategy
NRC	Nuclear Regulatory Commission
NEI	Nuclear Energy Institute
RHR	Residual Heat Removal
UFSAR	Updated Final Safety Analysis Report