UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

April 8, 2010

Mr. Thomas P. Joyce
President and Chief Nuclear Officer
PSEG Nuclear LLC – N09
P.O. Box 236
Hancock's Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 – NRC EVALUATION OF CHANGES, TESTS, AND EXPERIMENTS AND PERMANENT MODIFICATIONS TEAM INSPECTION REPORT 05000272/2010008 and 05000311/2010008

Dear Mr. Joyce:

On February 25, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Salem Nuclear Generating Station, Unit Nos. 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on February 25, 2010, with Mr. C. Fricker 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 of significance were identified.

In accordance with 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 Docket Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Lawrence T. Doerflein

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

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

Enclosure: Inspection Report No. 05000272/2010008 and 05000311/2010008
w/ Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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/RA/

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-272, 50-311
License No.:	DPR-70, DPR-75
Report No.:	05000272/2010008 and 05000311/2010008
Licensee:	PSEG Nuclear LLC (PSEG)
Facility:	Salem Nuclear Generating Station, Unit Nos. 1 and 2
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Inspection Period:	February 8 – 25, 2010
Inspectors:	P. McKenna, Reactor Inspector, Division of Reactor Safety (DRS), Team Leader M. Balazik, Reactor Inspector, DRS L. Scholl, Senior Reactor Inspector, DRS
Approved By:	Lawrence T. Doerflein, Chief Engineering Branch 2 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000272/2010008 and 05000311/2010008; 02/08/2010 – 02/25/2010; Salem Nuclear Generating Station Unit Nos.1 and 2; Engineering Specialist Plant Modifications Inspection.

The report covers a two week on-site inspection of the evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by three region based engineering inspectors. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

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 (27 samples)

a. Inspection Scope

The team reviewed five safety evaluations to determine 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 10 CFR 50.59 requirements. In addition, the team evaluated whether PSEG had been required to obtain NRC approval prior to implementing the change. The team interviewed plant staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, the Technical Specifications (TSs), 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 a sample of twenty two 10 CFR 50.59 screenings and applicability determinations for which PSEG had concluded that no safety evaluation was required. These reviews were performed to assess whether PSEG's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample included design changes, calculations, procedure changes, and setpoint changes.

The team reviewed the safety evaluations that PSEG had performed during the time period covered by this inspection (i.e. since the last modifications inspection). 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 PSEG's administrative procedures used to control the screening, preparation, review, and approval of safety evaluations to the guidance in NEI 96-07 to determine whether those procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations, screenings, and applicability determinations are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Permanent Plant Modifications (12 samples)

.2.1 Replacement of Service Water Valves 12SW33, 12SW35, 12SW37, 12SW46, and 12SW469, Unit 1

a. Inspection Scope

The team reviewed a modification (Design Change Package (DCP) 80096213) that replaced several 6 inch service water (SW) valves to include 12SW33, 12SW35, 12SW37, 12SW46, and 12SW469. The modification was implemented because the existing valves had a history of seat leakage. The valves were replaced with valves made out of a more corrosion resistant material.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the service water system had not been degraded by the modification. The team reviewed PSEG's installation work order, including the adequacy of the post-modification testing results. The team interviewed engineering staff and conducted a walk down of the installed valves to determine if the material condition and performance of the SW system was acceptable and in accordance with design assumptions. The team also reviewed stress calculations and conducted a walk down of the additional pipe supports installed for this modification to assess the installed configuration. Additionally, the team reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.2 Emergency Diesel Generator Field Flashing Relay Replacement, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80095529) that replaced the K1C field flashing relay and installed an additional relay to the field flash supervisory circuit of the Unit 2 "A" emergency diesel generator (EDG). The field flash relay was replaced because the original style relay was no longer available and the second relay was installed to improve the electrical separation of the supervisory circuit from the K1C relay. The supervisory circuit provides indication to plant operators that the field flash relay had not properly reset or that the operating coil had failed open. Either condition, if left uncorrected, would prevent proper field flashing during the next start of the EDG.

The team assessed the modification to verify that the design bases and performance capability of the EDG had not been adversely impacted by the relay and circuitry changes. The team also discussed the impact of the modification on the EDG operation with responsible engineers and reviewed the status of these changes for the remaining EDGs. The engineers confirmed that all of the EDGs had received the same modification under other similar design change packages. The team performed a field inspection of accessible portions of the circuits to assess the quality of the modification work and the overall material condition of the equipment. The adequacy of the post-modification testing was verified and affected design documents were reviewed to ensure they had been properly updated. The team also reviewed the 10 CFR 50.59 screening associated with this design change. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.3 Replacement of Auxiliary Feedwater Storage Tank (AFST) Check Valve (2DR7), Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 2EE00337) that replaced the AFST isolation check valve (2DR7). Check valve 2DR7 serves as an isolation between the AFST and the demineralized water system, which is used to fill the AFST. The design function of the check valve is to prevent inadvertent draining of the AFST during a pipe break or loss-of-offsite power, thereby ensuring AFST operability. The modification was implemented to address obsolescence of check valve parts and the seat leakage history of the installed valve. In addition, the modification installed an upstream vent valve (2DR174) to allow for testing of check valve 2DR7.

The review was performed to verify that the design and licensing bases and performance capability of the AFST had not been degraded by the modification. The team assessed whether the component safety classification and specific safety functions were maintained. The team reviewed various technical evaluations to assess whether the modification was consistent with assumptions in the design and licensing bases related to the operation of the auxiliary feedwater system. Surveillance and post-modification test results were reviewed to verify the check valve would function in accordance with the design assumptions and to verify that test results appropriately supported system operability. The team performed a walkdown to assess the system material condition and the installed configuration of the check valve and vent valve. The team also reviewed affected plant documents and drawings to verify they were appropriately updated. Finally, the team conducted interviews with engineering staff to determine if the valve would function in accordance with technical and design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.4 Replacement of Inboard Containment Purge Supply and Exhaust Isolation Valves (2VC2 and 2VC3) with Blind Flanges, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80091075) that replaced the inboard containment purge supply isolation valve (2VC2) and the inboard containment exhaust isolation valve (2VC3) with double O-ring, testable, 36 inch, blind flanges. PSEG implemented this modification because the containment isolation valves in the containment purge system have had a history of requiring repair to pass leak rate tests and that spare parts were not readily available. The containment purge system is a normally closed, deactivated system that is manually energized as required to perform purging of the containment atmosphere following a plant shutdown. The blind flanges are removed during modes 5 and 6 to allow containment purge system operation. The outboard supply and exhaust containment isolation valves (2VC1 and 2VC4) serve as containment closure valves if an isolation of containment is required during modes 5 or 6. The blind flanges are reinstalled and leak rate tested prior to changing to mode 4.

The team reviewed the modification to verify that the design bases, licensing bases, and performance capability of the containment purge system and the containment had not been degraded by the modification. The team also reviewed the 10 CFR 50.59 screen, as described in section 1R17.1 of this report, and a previously NRC approved license amendment (No. 260) associated with this modification. The team interviewed engineering staff and reviewed technical evaluations associated with the modification to determine if the blind flanges would function in accordance with the design assumptions. The team also reviewed PSEG's installation work order including post-modification testing results to ensure appropriate acceptance criteria had been applied. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.5 Motor Control Center Feeder Circuit Breaker Replacement, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80095528) that replaced the K225 frame circuit breaker with a K600 frame circuit breaker in Unit 2 vital bus 2B position S2230-2BY1AX3Y. The replacement was necessary to make the circuit breaker configuration consistent with the electrical bus configuration. Specifically, the bus bars in the affected location where the circuit breaker line side connected were 0.5 inch thick and therefore designed for a 600 amp rated circuit breaker. However, the design drawing improperly specified a 225 amp breaker (designed to connect to a 0.25 inch thick bus bar), resulting in the mismatch between the breaker and bus configuration. This mismatch could result in excessive stresses on the circuit breaker line side connections and/or the bus bars.

The team reviewed the change to ensure that the design bases and performance capability of the vital bus were not affected by the change. This included a review of the replacement circuit breaker over current protection trip unit set points and time/current characteristics to ensure they remained consistent with design bases information (e.g. circuit breaker coordination calculations). The inspectors discussed the change with the responsible design and system engineers to evaluate the extent-of-condition and verify consistency between the design documentation and installed configuration on similar load centers. The team also verified affected procedures and design drawings had been properly updated. A field walk down was performed to verify the circuit breaker configuration in the affected Unit 1 and 2 vital buses was consistent with the design documents. The team also reviewed the 10 CFR 50.59 screening associated with this design change. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.5 Actuator Modification of Residual Heat Removal (RHR) System Suction Valves, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80090480) that replaced the actuator gearing of the containment sump suction valves (21SJ44 and 22SJ44). The modification was implemented to address low thrust margin of the valves when subjected to a potentially higher differential pressure developed across the valves due to operation of the RHR pumps on minimum flow during certain small break loss-of-coolant accidents. Also, a gearing replacement was performed on the refueling water storage tank (RWST) suction valves, 21RH4 and 22RH4, to decrease the stroke time to ensure the RWST operability was not impacted. In addition, the team reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report.

The review was performed to verify that the design and licensing bases and performance capability of the RHR system had not been degraded by the modification. The team assessed whether the modification was consistent with assumptions in the design and licensing bases. Additionally, post-modification, diagnostic, and stroke-time testing data was reviewed to verify the operability and thrust margin of the valves. The review included verifying the UFSAR, calculations, test and operating procedures were updated to incorporate the modification. The team verified that the operator training plan was also appropriately updated to incorporate the modification. Finally, the team conducted interviews with engineering staff to determine if the valves would function in accordance with technical and design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.7 Relocation of Service Water Accumulator Injection Line Check Valves, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80092250) that relocated the SW accumulator injection line check valves (21SW536 and 22SW536). Two 15,000 gallon pressurized storage tanks are connected to the SW piping downstream of the SW pumps in order to keep the containment fan cooler units (CFCU) SW piping full of water following a loss-of-offsite power (LOOP). The check valves in this piping prevent backflow from the SW headers to the accumulators during normal operations. PSEG implemented this modification to reduce the horizontal sections of SW pipe that were exposed to silt downstream of the check valves. The presence of silt adjacent to the valves discs could potentially impact valve opening.

The team reviewed the modification to verify that the design bases, licensing bases, and performance capability of the SW system had not been degraded by the modification. The team reviewed the documentation supporting PSEG's evaluation and determination that it was acceptable to relocate the check valves next to the 90 degree elbows in the SW injection piping. The team reviewed calculation S-C-SW-MEE-1910, Salem Units 1 & 2 CFCU Accumulator Injection Piping – Allowable Levels of Silt Accumulation during Plant Operation, to assess the impact of silt accumulation in CFCU accumulator injection piping during plant operation. The team reviewed PSEG's installation work order, post-modification testing results, and revised pipe stress calculations for adequacy. The team also interviewed engineering staff and conducted a walk down of the installed valves to determine if the material condition and performance of the SW system was acceptable and in accordance with design assumptions. In addition, the team reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.8 Reactor Coolant System (RCS) Cold and Hot Leg Thermowell and RTD Replacement, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80091019) that replaced the Unit 2 reactor coolant system hot and cold leg piping thermowells and associated narrow range resistance temperature detectors (RTDs). The thermowells are part of the reactor coolant system (RCS) pressure boundary and house the narrow range RTDs. The material of the original thermowells was Alloy 600 and the material of the replacement thermowells was 316 stainless steel. This change was implemented to eliminate the Alloy 600 material in order to reduce the plant's susceptibility to potential primary water stress corrosion cracking (PWSCC) issues.

The team discussed the change with the responsible design engineers and evaluated the change to verify it did not adversely impact the design function of the thermowells and RTDs. The inspectors reviewed the results of the post-modification testing to verify the integrity of the primary system and the accuracy and operability of the RTDs. In addition, the team verified affected design documents and instrumentation calibration procedures had been updated to incorporate the modification. The team also reviewed the 10 CFR 50.59 screening associated with this design change as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.9 Modification of Pressurizer Spray Valves Internals (PS-1 & PS-3), Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80098324) that replaced the valve internals of the pressurizer spray valves (PS-1 and PS-3). The modification was implemented to address valve performance issues and obsolescence of vendor parts. Specifically, the modification eliminated the valve internal bellows, replaced the valve actuator, removed the valve bonnet extension, and upgraded the valve flow control characteristics. The review was performed to verify that the design bases, licensing bases, and performance capability of the pressurizer system had not been degraded by the modification. In addition, the team reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report.

The team assessed whether the modification was consistent with assumptions in the design and licensing bases. Additionally, diagnostic and stroke-time testing data was reviewed to verify the operability of the valves. The team reviewed selected plant procedures, calculations, training plans, and drawings to verify they were properly updated to incorporate the modification. Finally, the team conducted interviews with engineering staff to determine if the valve would function in accordance with technical and design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.10 MOV Margin Recovery Modifications for Valves 2RH2 & 2RH26, Unit 2

The team reviewed a modification (DCP 80093314) that enhanced motor operated valve (MOV) margin for valve 2RH26 (RHR to RCS hot leg recirculation isolation valve) and valve 2RH2 (RCS hot leg to RHR suction header valve). This modification changed the packing arrangement in both valves from two sets of six rings each to one set of five rings. Additionally, a leak off port in-between the two sets of packing was cut and capped for each valve. The modification to the valve packing reduced friction loads on the valve stem. Valve 2RH26 was also modified to replace the torque switch with a limit switch to control seating force.

The team reviewed the modification to verify that the design bases, licensing bases, and performance capability of the RHR system had not been degraded by the modification. The review included verifying the UFSAR, calculations, and test and operating procedures were updated to incorporate the modification. The team also reviewed PSEG's installation work order including post-modification, diagnostic, and stroke-time testing data to verify the operability and thrust margin of the valves. In addition, the team conducted interviews with engineering staff to determine if the valves would function in accordance with technical and design assumptions. Finally, the team reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.11 Containment Atmosphere Hydrogen Monitor Replacement, Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80091022) that replaced the Unit 2 containment atmosphere monitoring hydrogen analyzers. This change was implemented because the original analyzers had become obsolete and replacement parts were no longer available.

The team reviewed the change to verify that the design bases and performance capability of the hydrogen monitors had not been adversely impacted by the change. The review included verification that the accuracy of the new monitors met the value specified in the UFSAR. The inspectors discussed the change with the responsible design engineer to assess any potential impacts on system operation and to ensure the design functions were not adversely affected. The team also verified post-modification calibration and testing were adequate to ensure system operability. The team also verified affected procedures and design documents had been appropriately updated to incorporate the modification. A field walkdown of the new monitors was performed to verify the installed configuration was as described in the design change documentation. The team also reviewed the 10 CFR 50.59 screening associated with this design change. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2.12 Modification of Containment Spray Injection Valves (21CS2 & 22CS2), Unit 2

a. Inspection Scope

The team reviewed a modification (DCP 80093311) that upgraded the capability of the containment spray (CS) injection valves (21CS2, and 22CS2). The CS2 motor operated valves are normally closed valves that receive an automatic signal to open on high containment pressure. The modification was implemented to address low thrust margin of the valve actuator during design basis events. Specifically, the modification replaced the valve 10 foot-pound (ft-lb) actuator motors with 15 ft-lb actuator motors, as well as an actuator gearing replacement. The new motors provided greater thrust margin to ensure operation during conditions of high differential pressure across the valve. In addition, the team reviewed the 10 CFR 50.59 screen associated with this modification as described in section 1R17.1 of this report.

The review was performed to verify that the design and licensing bases and performance capability of the containment spray system had not been degraded by the modification. The team assessed whether the modification was consistent with assumptions in the design and licensing bases. Additionally, post-modification, diagnostic, and stroke-time testing data was reviewed to verify the operability and thrust margin of the valves. The team's review included verifying the UFSAR, calculations, and test and operating procedures were appropriated updated to incorporate the modification. The team performed a walkdown to assess the material condition and installed configuration of the valve actuators. Finally, the team conducted interviews with engineering staff to determine if the valves would function in accordance with technical and design assumptions. The documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

The team reviewed a sample of problems that PSEG had previously identified and entered into the corrective action program. The team reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, condition reports written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

The team presented the inspection results to Mr. C. Fricker, Site Vice-President, and other members of PSEG's staff at an exit meeting on February 25, 2010. The team returned the proprietary information reviewed during the inspection to the licensee and verified that this report does not contain proprietary information.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

PSEG Personnel
M. Ahmed, Design Engineering
R. DeSanctis, Director Maintenance
A. Garcia, System Engineering
F. Hummel, System Engineering
A. Johnson, Manager, Design Engineering
D. Johnson, Programs Engineering
W. Kittle, Programs Engineering
K. Mathur, Design Engineering
W. Mattingly, Manager, Regulatory Assurance
R. Moore, System Engineering
N. Ortiz, Design Engineering
R. Page, Design Engineering
J. Patel, Design Engineering
M. Puher, Design Engineering
L. Rajkowski, Engineering Director
T. Ram, System Engineering
F. Szanxi, Programs Engineering
E. Villar, Regulatory Compliance

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

None.

LIST OF DOCUMENTS REVIEWED

10 CFR 50.59 Evaluations
S2006-143, Replacement of Steam Generators, Rev. 0
S2007-213, Calculation Methodology Change for Determining RHR Pump NPSH during Post LOCA Recirculation Operation, Rev. 0
S2008-028, Implementation of the Equivalent Closure Device for TS 3/4.9.4 and Containment Closure for Loss of RHR Events During S2R16, Rev. 0
S2008-105, Steam Generator Supports, Rev. 2
S2008-212, Steam Generator Carryover Test, Rev. 0

10 CFR 50.59 Screened-out Evaluations
S2007-149, Replace 2VC2 and 2VC3 Valves with Blind Flanges, Rev. 0
S2007-188, Salem Unit 2 SW Accumulator Injection Line Modification, Rev. 0
S2007-258, Procedure Revision/1-EOP-TRIP-2, Rev. 0
S2007-280, Install Temporary Jumper Across Enable Switches SO2, Rev. 0
S2007-288, Replacement of RCS Hot & Cold Leg Piping RTDs and Thermowells, Rev. 0
S2007-315, Change Stroke Times on SJ44 & RH4 Valves, Rev. 1
S2007-350, Salem Unit 1 & 2 Pressurizer Level, Rev. 0

S2007-352, Salem Unit 1 & 2 Reactor Flux Power Range, Rev. 0
S2007-360, Replace Valve Actuator Motor MOVs 21CS2, 22CS2, and Limit Seat MOV Valve 22CS36, Rev. 0
S2007-383, MOV Margin Recovery Modifications for Valves 2RH2 & 2RH26, Rev. 0
S2008-013, 12 Service Water Strainer Non-Conformance, Rev. 0
S2008-155, Unit 1 & 2 CVC Letdown Heat Exchanger Outlet Control Valve, Rev. 0
S2008-216, Replacement of Service Water Valves 12SW33, 12SW35, 12SW37, 12SW46, 12SW469, Rev. 0
S2008-245, SSPS Circuit Card Upgrade, Rev. 0
S2008-268, Salem Service Water Pump Mechanical Seal Modification, Rev. 0
S2008-315, Reactor Coolant System Water Inventory Balance, Rev. 0
S2009-041, Unit 1 NIS Power Range Negative Flux Rate Trip Elimination, Rev. 0
S2009-092, 1B Diesel Generator Auxiliaries Air and Turbo Boost Air Check Valve Test, Rev. 0
S2009-148, Modify Pressurizer Spray Valve Internals, Rev. 0
S2009-210, Hot Standby to Cold Shutdown, Rev. 0
S2009-230, Temporary Power to 22 Containment Spray Motor, Rev. 0
S2009-261, Unit 1 Thermal Overload and Circuit Breaker Changes, Rev. 0

<u>Calculations</u>
267733, Service Water Return Piping, Rev. 5
267735, Service Water Return Piping, Rev. 4
267788, Service Water Piping, Rev. 4
5671386, Service Water Piping, Rev. 12
5671387, Service Water Piping, Rev. 15
567570, Auxiliary Feedwater Piping Stress Calculation, Rev. 4
5675247, Service Water Piping – Accumulator Fill Line Pump 21, Rev. 2
5675248, Service Water Piping – Accumulator Fill Line Pump 22, Rev. 1
1A-DWA-0190, Pipe Support Calculation for DWA-190, Rev. 1
S-2-SJ-MDC-2125, Salem Unit 2 RWST to Containment Sump Switchover Drain Down, Rev. 0
SC-CB-V001-01, Salem Unit 1&2 Containment Ventilation Hydrogen Analyzer, Rev. 0
SC-RC-P001-01, Over Temperature DT Scaling Salem Unit 2, Rev. 6
S-C-DG-MDC-1101, Comparison of Emergency Diesel Generator Turbo Boost Air System Demand Versus Design, Rev. 1
S-C-RC-SEE-0545, Station Blackout Analysis in Support of Unit 2 Steam Generator Replacement, Rev. 0
S-C-SJ-MDC-2124, Pressure Increase on RHR Side of SJ44 Following Small Break LOCA, Rev. 0
S-C-SJ-MDC-2127, Design Basis Differential Pressure (21SJ44 & 22SJ44), Rev. 0
ES-4.003(Q), 125 Volt DC Short Circuit and System Voltage Drop Calculation, Rev. 7
ES-4.006(Q), 125 Volt DC Component Study and Voltage Drop Calculation, Rev. 6
MIDACALC Results, 21CS2, Rev. 2
MIDACALC Results, 22CS2, Rev. 1
MIDACALC Results, 2RH2, Rev. 1
MIDACALC Results, 21RH4, Rev. 1
MIDACALC Results, 22RH4, Rev. 1
MIDACALC Results, 2RH26, Rev. 1
MIDACALC Results, 21SJ44, Rev. 1
MIDACALC Results, 22SJ44, Rev. 1

Completed Work and Test Procedures

S2.OP-LR.MP-0001(Q), 2VC2 & 2VC3 Blind Flange Type B Mechanical Penetration Leak Rate Testing, performed 5/03/08
S2.OP-ST.CS-0003(Q), Inservice Testing Containment Valves, performed 11/17/09
S2.OP-ST.PZR-0003(Q), Inservice Testing Pressurizer PORV and Spray and Reactor Head Vent Valves, performed 10/20/09
S2.OP-ST.RHR-0003, Inservice Testing Residual Heat Removal Flow Path Valves, performed 11/12/09
S2.OP-ST.RHR-0004(Q), Inservice Testing Residual Heat Removal Valves, performed 11/02/09
S2.OP-ST.SJ-0005(Q), Inservice Testing Safety Injection Valves Modes 5-6, performed 10/29/09
S2.OP-ST.ZZ-0003(Q), Inservice Testing Miscellaneous Valves, performed 06/19/08, 12/17/09, & 01/07/10
SH.MD-GP.ZZ-0003(Q), General Instructions for Valve Packing, performed 3/24/08

Design & Licensing Bases

LCR S06-06, Request for Change to Technical Specifications, Containment Ventilation System, Containment Isolation Valves, Salem Nuclear Generating Station – Unit 1 and 2, Docket Nos. 50-272 and 50-311, Facility Operating License Nos. DPR-70 and DPR-75, dated 08/04/06
LR-N07-0032, Response to RAIs on LCR S06-06 Request for Change to Technical Specifications Containment Ventilation System Containment Isolation Valves, dated 02/20/07
LA 260 and 277, Salem Nuclear Generating Station, Unit Nos. 1 and 2, Issuance of Amendments Re: Containment Purge System, dated 03/19/07
SC.DE-BD.CS-0001(Q) Design Bases Documentation for Containment Spray System, Rev. 0
SC.DE-BD.RC-0001(Q) Design Bases Documentation for Reactor Coolant System, Rev. 0
SC.DE-BD.AF-0001(Q) Design Bases Documentation for Auxiliary Feedwater System, Rev. 0

Drawings

205246-A-8761, Units 1 & 2 Demineralized Water PI&D, Sh. 2, Rev. 37
205334-A-8763, Unit 2 Safety Injection PI&D, Sh.2, Rev. 51
205334-A-8763, Unit 2 Safety Injection PI&D, Sh.3, Rev. 58
205332-A-8763, Unit 2 Residual Heat Removal PI&D, Sh. 2, Rev. 33
205332-A-8763, Unit 2 Residual Heat Removal PI&D, Sh. 1, Rev. 36
205301-A-8762, Unit 2 Reactor Coolant P&ID, Sh.1, Rev. 58
205342, No. 2 Unit Service Water Nuclear Area, Rev. 7
222485-A-1779, Unit 2 Auxiliary Building 2C West Valves One-Line Electrical Drawing, Sh. 1, Rev. 50
601401, Auxiliary Building Control Area 2B-230V Vital Bus One-Line, Rev. 22
904093, Schematic Diagram Insitu Micro, Rev. A
C-401522, Trim Assembly, Sh. 1, Rev. 0
D-401194, Series D-100 Valve Assembly with Model 1000-160 RA Actuator, Sh. 1, Rev. 4
D-401193, Series 1000-160 RA Actuator with Travel Stops, Sh. 1, Rev. 1
D-5587-326-001, Hot Leg Thermowell, Rev. 4
D-5587-326-002, Cold Leg Thermowell, Rev. 4
E-5587-326-004, Cold Leg Installation, Rev. 4
E-5587-326-005, Hot Leg Installation, Rev. 5

Engineering Evaluations

3SC-025, Technical Evaluation of Replacement RCS Hot & Cold Leg Thermowells, Rev. 0
S-C-ZZ-CEE-0673 Justification for Exempting VC1, VC2, VC3, and VC4 Limit Switches from Environmental Qualification, dated 04/15/92
S-C-SW-MDC-1705, Service Water System Transient Analysis Model, Rev. 1
S-C-SW-MDC-1967, Service Water System Thermal Hydraulic Model, Rev. 4
S-C-SW-MEE-1138, Salem Generic Letter 96-06 Evaluation Salem Units 1 & 2, Rev. 2
S-C-SW-MEE-1910 Salem Units 1 & 2 CFCU Accumulator Injection Piping – Allowable Levels of Silt Accumulation during Plant Operation, Rev. 1

Miscellaneous

09-026, 2DR7 Operability Evaluation, dated 12/23/09
70105383, Permanent Plant Modifications Check-In Self-Assessment Report, dated 01/18/10
Flowserve Technical Update 08-01, Reliance/Magnesium Rotors, dated 12/19/08
Flowserve Technical Update 06-01, Reliance/Magnesium Rotors, dated 12/26/06
MPR Associates, Inc. Memorandum on Salem CFCU Simplification Project – Modification Scope for Tank Elimination, dated 12/29/06
MPR Associates, Inc. Memorandum on Alternatives to Prevent Silting in Service Water Accumulator Piping, dated 07/22/07
NEI 96-07, Guidelines for 10 CFR 50.59 Implementation, Rev. 1
NRC Regulatory Guide 1.187, Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments, dated November 2000
NRC Regulatory Guide 1.186, Guidance and Examples for Identifying 10 CFR 50.2 Design Bases, dated December 2000
Salem Inservice Testing Program Basis Data Sheets for 2RH2 & 2RH26, dated 12/01/97
Salem Licensed Operator Training Requalification Segment 0910-5 & 0708-4

Modifications

DCP 2EE00337, Replacement of Demineralized Water Check Valve 2DR7, Rev. 1
DCP 80090480, Change Stroke times on SJ44 & RH4 Valves, Rev. 1
DCP 80091075, Replace 2VC2 and 2VC3 Valves with Blind Flanges, Rev. 1
DCP 80092250, Salem Unit 2 SW Accumulator Injection Line Modification, Rev. 2
DCP 80093311, Replace Valve Actuator Motor MOV 21CS2, 22CS2 and Limit Seat MOV Valve 22CS36, Rev. 1
DCP 80093314, MOV Margin Recovery Modifications for Valves 2RH2 & 2RH26, Rev. 0
DCP 80095529, Emergency Diesel Generator Field Flashing Relay Replacement, Rev. 1
DCP 80095528, Unit 2 Motor Control Center Feeder Circuit Breaker Replacement, Rev. 0
DCP 80096213, Replacement of Service Water Valves 12SW33, 12SW35, 12SW37, 12SW46, 12SW469, Rev. 0
DCP 80098324, Modify Pressurizer Spray Valve Internals, Rev. 2
DCP 80091019, Reactor Coolant System (RCS) Cold and Hot Leg Thermowell and RTD Replacement, Rev. 1
DCP 80091022, Unit 2 Containment Atmosphere Hydrogen Monitor Replacement, Rev. 0

Notifications

20237971	20236105	20362020	20366041
20438556	20444369	20444685	20450728*
20450729*	20450730*	20450731*	20451971*
20451987*	20452105*	20452175*	20452273*

* Notification written as a result of inspection effort

Procedures

2-EOP-LOCA-3, Transfer to Cold Leg Recirculation, Rev. 28
2-EOP-LOCA-1, Loss of Reactor Coolant, Rev. 28
2-EOP-Trip-1, Reactor Trip or Safety Injection, Rev. 27
S2.IC-CC.CBV-0002(Q), 22 (2XA3359) Containment Hydrogen Analyzer, Rev. 8
S2.OP-SO.DG-0001(Q), 2A Diesel Generator Operation, Rev. 36
S2.OP-SO.SW-0006, Service Water Accumulator Operation, Rev. 9
S2.OP-ST.SW-0015, Inservice Testing Service Water System CFCU and Accumulator Check Valves, Rev. 7
S2.PI-SP.SG-0004(Q), Steam Generator Moisture Carryover Test, Rev. 0
CC-AA-103-1005, Evaluating and Mitigating Electrically Induced Noise In Instrumentation and Control Circuits, Rev. 1
SC.IC-PM.RC-002(Q), Pressurized Spray Valve Operator Maintenance, Rev. 8
SC.MD-CM.230-0001Q), 230 and 460 Volt ITE K-Series Breaker Maintenance, Rev. 5
SC.MD-CM.RC-0002(Q), Pressurizer Spray Valve PS1 and PS3 Repair, Rev. 6
SC.MD-PM.230-0003(Q), 230 and 460 Volt ABB K-Line Circuit Breaker Preventive Maintenance, Rev. 5
SC.MD-PM.ZZ-0123, Disassembly, Inspection and Reassembly of Dual Plate Check Valves, Rev. 13
SC.MD-ST.230-0003(Q), 230 and 460 Volt ABB K-Line Circuit Breaker Refurbishment, Rev. 24
SH.MD-GP.ZZ-0240(Q), System Pressure Test at Normal Operating Pressure and Temperature, Rev. 10
SH.MD-IT.ZZ-3907(Q), General Mechanical Equipment Inspection and Functional Testing, Rev. 1

Vendor Technical Documents

VTD 303254, Seismic Report for 6-inch 150 Dual Plate Check Valve, Rev. 5
VTD 316968, Engineering Design/Seismic Report 10" Dual Plate Check Valve, Rev. 4
VTD 322681, Design/Seismic Report for 1" Fullport Flanged End Ball Valve, Rev. 2
VTD 326317, 36 inch Testable Blind Flange, Rev. 0
VTD 901603, Steam Generator Moisture Carryover Evaluation Test Results, dated 01/08/09

Work Orders

30087129	30119589	30135248	30135255
30135254	30162529	60007404	60059037
60068308	60069077	60071106	60071107
60075842	60075941	60078148	60078149
60083557	60083558	70048711	70056975
70062703	70062810	70082970	70088222
70088801	70092440	70092441	70100505
70104163	70105463	80098851	

LIST OF ACRONYMS

ADAMS	Agency-Wide Documents Access and Management System
AFST	Auxiliary Feedwater Storage Tank
CFCU	Containment Fan Cooling Unit
CFR	Code of Federal Regulations
CS	Containment Spray
CVC	Chemical and Volume Control
DCP	Design Change Package
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
LOCA	Loss-of-Coolant Accident
LOOP	Loss-of-Offsite Power
MOV	Motor Operated Valve
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
P&ID	Piping and Instrument Diagram
PS	Pressurizer Spray
PSEG	PSEG Nuclear LLC
PWSCC	Primary Water Stress Corrosion Cracking
RAI	Request for Additional Information
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RTD	Resistance Temperature Detector
RWST	Refueling Water Storage Tank
SW	Service Water
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VC	Vapor Containment