

April 23, 2002

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

SUBJECT: SALEM NUCLEAR GENERATING STATION
NRC INSPECTION REPORT 50-272/02-02, 50-311/02-02

Dear Mr. Keiser:

On March 15, 2002, the NRC completed a team inspection at the Salem Nuclear Generating Station, Units 1 and 2. The enclosed report documents the results of that inspection which were discussed with Messrs. J. Carlin and D. Garchow, and other members of your staff on March 15, 2002.

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. Within these areas, the inspection consisted of a selected examination of procedures and records, observation of activities, and interviews with personnel.

No findings of significance were identified.

In accordance with 10CFR2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's Agency Wide Document and Access Management 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,

/RA/

Lawrence T. Doerflein, Chief
Systems Branch
Division of Reactor Safety

Docket No. 50-272, 50-311
License No. DPR-70; DPR-75

Enclosure: Inspection Report 50-272/02-02, 50-311/02-02

cc w/encl:

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D. Garchow, Vice President - Operations

G. Salamon, Manager - Licensing

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State of Delaware

N. Cohen, Coordinator - Unplug Salem Campaign

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Harold W. Keiser

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Region I Docket Room (with concurrences)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-272
50-311

License No.: DPR-70
DPR-75

Report No: 50-272/02-02, 50-311/02-02

Licensee: PSEG Nuclear LLC

Facility: Salem Nuclear Generating Station, Units 1 & 2

Location: P.O. Box 236
Hancocks Bridge, NJ 08038

Dates: February 25 - March 1 and March 11 - 15, 2002

Inspectors: A. Della Greca, Team Leader
A. Blamey, Sr. Reactor Inspector
S. Chaudhary, Reactor Inspector
G. Cranston, Reactor Inspector
S. Pindale, Reactor Inspector
J. O'Hara, Trainee

Approved By: Lawrence T. Doerflein, Chief
Systems Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000272/2002-002, 05000311/2002-002; on 2/25-3/1 and 3/11-25/2002; PSEG Nuclear LLC; Salem Nuclear Generating Station, Units 1 & 2; Engineering Team Inspection Report.

The inspection was conducted by five region-based inspectors. No findings of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/reactors/operating/oversight.html>

A. Inspector Identified Findings

None

B. Licensee Identified Findings

None

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

a. Inspection Scope

The team reviewed a sample of safety evaluations (SEs) performed by PSEG during the last 18 months. The review was conducted to verify changes to the facility or procedures as described in the Salem Nuclear Generating Station Updated Final Safety Analysis Report (USFAR), and tests or experiments not described in the UFSAR, were reviewed and documented by the licensee in accordance with 10 CFR 50.59. The team also verified that the changes, tests, or experiments did not require prior NRC approval or a license amendment. The safety evaluations were selected based on the safety significance of the changes and the risk of such changes to structures, systems, and components. Where appropriate, the inspection included discussions with cognizant engineering personnel and review of supporting technical information, i.e., calculations, analyses, and industry recommendations.

The team also reviewed a sample of changes and tests for which the licensee determined that a safety evaluation was not required. This review was performed to verify that the licensee's threshold for performing safety evaluations was consistent with the requirements of 10 CFR 50.59. In addition, the team reviewed a sample of problem reports related to the safety evaluation process to verify the licensee was appropriately identifying problems regarding the program, and entering these concerns/problems into the corrective action system for appropriate resolution.

b. Findings

No findings of significance were identified.

1R21 Safety System Design and Performance Capability (71111.21)

a. Inspection Scope

The team reviewed the design and performance capability of the high and intermediate pressure safety injection systems and of the power operated relief valves (PORVs). The high pressure safety injection function is provided by the chemical and volume control (CVC) system. This system, among other functions, operates normally to maintain the required reactor coolant system water inventory and to provide cooling flow to the reactor coolant pump seals. The CVC and the intermediate pressure safety injection (SI) systems are used to provide emergency core cooling in the event of a break either in the reactor coolant system or the main steam system. The PORVs provide primary system overpressure protection and, during certain plant transients and accident conditions, are used, in conjunction with the emergency core cooling systems, to control primary system pressure and cooldown. The inspection criteria were based on the systems performance requirements derived from the Salem UFSAR, Technical Specifications, probabilistic risk assessment, and the NRC's risk informed inspection

notebook. To determine the system performance mitigation requirements, the team selected and reviewed accident and transient analyses' assumptions for sequences associated with the PORVs, and CVC and SI system components.

The team verified that: (1) the system design bases were in accordance with the licensing commitments and regulatory requirements; and (2) selected design documents, such as drawings and design calculations, were correct. The documents reviewed included engineering analyses, calculations, evaluation reports, piping and instrumentation drawings (PI&D), electrical schematics, and instrument setpoint documentation. Additionally, the team reviewed a sample of permanent modifications, including changes to procedures, repairs and component replacements, to confirm that the original design functions were being maintained. The mechanical design review focused on the capability of the systems to supply adequate water to the reactor coolant system under design and transient conditions.

For selected calculations and analyses, the team verified that the assumptions were appropriate and agreed with current plant configurations, that proper engineering methods and models were used, and that there were adequate technical bases to support the conclusions. When appropriate, the team performed independent calculations to evaluate the document adequacy.

In accordance with the inspection procedure, the team selected several major components for an in-depth inspection. These components included the power operated relief valves, the CVC and SI system pumps, and the refueling water storage tanks. The team also reviewed selected portions of design documents of interfacing systems, such as the service water, containment air, and electrical systems. For these systems, the team assessed their capability to satisfy the design functions of the systems inspected.

The team reviewed the operator's actions to align the systems for long-term reactor cooling, after a loss of coolant accident and after the reactor water storage tank was depleted. Specifically, the team verified that selected risk significant operator actions and operator actions important to safety could be properly accomplished within the time specified in the accident, transient and probabilistic safety analysis. The operator's actions evaluated included: (1) post-accident manual transfer from cold leg injection to hot leg recirculation (time critical); (2) safety Injection isolation during a steam generator tube rupture (time critical); (3) establishment of a primary system vent path after an unplanned and unneeded safety injection actuation (time critical); (4) reduction of primary system pressure using the pressurizer power operated relief valves; (5) isolation of emergency accumulators below a primary system pressure of 1000 psig; (6) reestablishment of reactor coolant pump seal water flow; and (7) control of minimum flow pump protection for the charging pumps.

The team also reviewed the current performance and test acceptance criteria for the CVC and SI systems to ensure consistency between allowable component performance and minimum allowable capabilities assumed in the accident analyses and associated design basis calculations. Preventive maintenance activities were reviewed to verify that maintenance was performed as scheduled using controlled procedures and that the system met its design basis function during the maintenance evolution. Additionally, the

team evaluated a sample of surveillance and post-maintenance test results to confirm system capability. Available trend and performance reports and graphs, such as system health reports and inservice test data, were also reviewed to evaluate historical system performance and trends. The team reviewed vendor manuals to ensure that vendor recommendations had been included in maintenance and test procedures.

The team reviewed electrical single line diagrams, logic and elementary schematic and wiring diagrams to confirm the redundancy of the power supplies for pumps, valves, instrumentation and control equipment within the inspection scope. Additionally, the team evaluated size and setting of overcurrent protective devices to ensure that adequate power was provided to the systems and components reviewed and that their independence was maintained under faulted conditions. The team also evaluated the environmental qualification and capability of the equipment to perform their safety functions under postulated accident conditions.

The team conducted a detailed walked-down of accessible portions of the selected systems, including the refueling water storage tanks and portions of supporting systems to verify that the installed configuration will support system function under accident and abnormal event conditions. The team also interviewed personnel responsible for certain aspects of system performance. Lastly, the team selected a sample of problem reports (notifications) associated with the selected systems to verify the licensee was identifying design issues at an appropriate threshold and entering them in the corrective action program and that appropriate corrective actions were being taken.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Management Meeting

The team presented the inspection results to Messrs. J. Carlin and D. Garchow, and other members of the licensee's staff at an exit meeting on March 15, 2002. The team verified that the inspection report does not contain proprietary information.

a. Key Points of ContactPSEG Nuclear LLC

H. Berrick, Nuclear Licensing Engineering
 J. Bisti, Design Change Package Engineering
 J. Carlin, Vice President - Nuclear Reliability
 V. Chandra, Design Engineer
 M. Conroy, Maintenance Rule Engineer
 K. Davison, Manager - Salem Operations
 G. Delp, Reliability Engineer
 J. Duffy, Design Engineer
 A. Fakhar, Manager - Reliability Programs
 J. Flanagan, Staff Engineer
 D. Garchow, Vice President - Operations
 F. Hummel, Primary Plant Performance Engineer
 A. Johnson, Supervisor - Maintenance Rule Program
 G. Jones, Technical Support Business Analyst
 S. Kobylarz, Supervisor, Electrical/I&C Engineering
 P. Koppel, Supervisor - Reliability Engineering
 D. Lyons, Staff Engineer
 S. Mannon, Manager - Performance Engineering
 D. McCollum, Supervisor - Engineering
 G. Morrison, Design Engineering
 J. O'Connor, Manager - Electrical and I&C
 R. Quinn, Supervisor - Engineering
 J. Rowey, Design Engineer
 G. Salamon, Manager - Nuclear Safety & Licensing
 R. Smith, Electrical/I&C Engineer
 S. Smith, Quality Assurance
 P. Steinhauer, Manager - Configuration/Reliability Support
 M. Welker, Reliability Engineer

b. List of Acronyms

AC	Alternating Current
CC	Component Cooling
CVC	Chemical and Volume Control
IST	In-Service Testing
NRC	Nuclear Regulatory Commission
PDP	Positive Displacement Pump
PI&D	Piping and Instrumentation Drawings
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Assessment
RHR	Residual Heat Removal

c. List of Acronyms (Cont.)

SDP	Significance Determination Process
SE	Safety Evaluation
SI	Safety Injection
TP	Surveillance Test Procedure
UFSAR	Updated Final Safety Analysis Report

d. Documents ReviewedCALCULATIONS and ANALYSES

267205C	Component Cooling Piping, Rev. 4
267220B	Component Cooling Piping, Rev. 4
267430	MSIV Piping, Rev. 2
70-6104	Heat Exchangers for Water Storage Tank Freeze Protection, Units 1 & 2
77-6121	Thermal Insulation of Nuclear Piping and Equipment, Unit 2
72-6205	Water Storage Tank Circulating Pumps, Units 1 & 2
82-6100	Heat, Anti-Sweat and Heat Tracing Insulation
1SC-163	Evaluation of RWST Nozzle Leakage, Rev. 0
FSE/SS-PSE-6769	Salem Charging/SI and IHSI ECCS Evaluation (TS verification and injection flow through hot and cold legs)
IEC 3530	Safety Evaluation for Cavitation/Debris Mitigation on Safety Injection and Charging/Safety Injection Lines
MPR 108-249-01	Salem RWST Main Outlet Nozzle Penetration Assessment (Stress Analysis per ASME Code), Rev. 0
MPR 108-249-03	Salem RWST Seismic Evaluation for Faulted Condition, Rev. 0
NSO-EEQ-008	Plant Life Operating Hours for the CC, SI, and RHR Pump Motors
NSO-EEQ-009	Verification of 40 Year Life and PAOP of CC, SI, and RHR Pump Motors
NSO-EEQ-0083	Qualified Life and PAOP of Westinghouse SI Pump Motors
SC-ABV-MDC-1838	Operability of CC, RHR, and CVCS Pumps Without Room Coolers in Modes 5, 6, and Defueled
SC-N600-MDM-0147	Charging Safety Injection Pumps Unit 1 and 2
SC-N600-MSE-088	Centrifugal Charging /Safety Injection (C/SI) Pumps Minflows Unit No. 1 and 2, Rev. 0
SC-SJ-MDC-1893	Allowable Volume of Non-Condensable Gases in RHR Recirc. Cross Connect Piping
SC-SJ-006-01	Salem Unit 1 RWST Level Uncertainty Calculation
SC-SJ-007-01	Salem Unit 2 RWST Level Instrument Uncertainty Calculation
SC-SJ-007-02	Salem Unit 2 RWST Low Level Trip Alarm Allowable Values
SC-SW-MDC-1500	Biofouling Monitoring and Trending Calculation, Rev. 0
SC-VAR-MEE-1071	Post-LOCA Reticulation ECCS Leakage Outside Containment Salem Unit 1 and 2
SC-VAR-NZZ-0020	UFSAR Chapter 15 DB/LB Accident Analysis Input Assumptions, Rev. 0
SC-ZZ-SDC-1419	Salem Generating Station Environmental Design Criteria, Rev. 2

b. Documents Reviewed (Cont.)CALCULATIONS and ANALYSES

- SC.DE-BD.SJ-0001(Q) System Performance Parameters and Limits for Large Break
LOCA - SI System, Rev. 0
- S1-RC-MZZ-0017 Root Cause Analysis Report for PORV 1PR-1 and 1PR-2
Degradation After Reactor Trip Event of April 7, 1994
- S2-N600-MSE-245 Safety Evaluation of the Potential Consequences of the Failure of
the SI Pump Discharge Header Relief Valves
- S2-RC-MDC-1724 Salem Unit 2 Available PORV Cycles for Mitigation for Inadvertent
SI

PROCEDURES

- NC.ER-AP.ZZ-0010(Q) Equipment Reliability Process, Rev. 1
- S1.IC-TR.ZZ-0002(Q) Unit 1 Master Time Response, Rev. 14
- S2.IC-TR.ZZ-0002(Q) Unit 2 Master Time Response, Rev. 15 - Completed
Surveillance
- S1.OP-AB.CR-0002 Control Room Evacuation Due to Fire in the Control Room,
Relay Room, or Ceiling of the 460/230V Switchgear Room,
Rev. 11
- S1.OP-AB.LOOP-0001 Loss of Off-Site Power, Rev. 10
- S1.OP-AB.460-0001(Q) Loss of 1A 460/230V Vital Bus, Rev. 7
- S1.OP-AB.4KV-0001(Q) Loss of 1A 4KV Vital Bus, Rev. 3
- S1.OP-AB.4KV-0003(Q) Loss of 1C 4KV Vital Bus, Rev. 1
- S1.OP-AR.ZZ-0002(Q) Annunciator Response for HEAT TRACE TRBL, Rev. 17
- S1.OP-DL.ZZ-0003(Q) Control Room Log - Mode 1-4, Rev. 25
- S1.OP-DL.ZZ-0006(Q) Primary Plant Log, Rev. 26
- S1.OP-PT.CVC-0002(Q) Charging Pump Flow Test, Modes 5 - 6, Rev. 1 (Performed
October 1997)
- S1.OP-PT.SW-0004(Q) Service Water Biofouling Monitoring - Safety Injection and
Charging Pumps, Rev. 5
- S1.OP-ST.CVC-0003(Q) Inservice Testing - 11 Charging Pump, Rev. 12
- S1.OP-ST.DG-0001(Q) 1A Diesel Generator Surveillance Test, Rev. 33
- S1.OP-ST.SJ-0002(Q) Inservice Testing - 12 Safety Injection Pump, Rev. 9
- S1.OP-ST.SJ-0012(Q) Emergency Core Cooling - ECCS Throttle Valves, Rev. 6
- S1.OP-ST.SJ-0014(Q) Intermediate Head Cold Leg Throttling Valve Flow Balance
Verification, Rev. 9 (Performed April 2001)
- S1.OP-ST.SJ-0015(Q) Intermediate Head Hot Leg Throttling Valve Flow Balance
Verification, Rev. 9 (Performed October 2001)
- S1.OP-ST.SJ-0016(Q) High Head Cold Leg Throttling Valve Flow Balance
Verification, Rev. 10 (Performed May 2001)
- S1.OP-ST.SSP-0011(Q) Engineer Safety Feature Response Time Testing, Rev. 7
- S1.RA-ST.CVC-0003(Q) Inservice Testing - 11 Charging Pump Acceptance Criteria,
Rev. 6
- S1.RA-ST.CVC-0004(Q) Inservice Testing - 12 Charging Pump Acceptance Criteria,
Rev. 5

b. Documents Reviewed (Cont.)PROCEDURES (Cont.)

S1.RA-ST.SJ-0001(Q)	Inservice Testing - 11 Safety Injection Pump Acceptance Criteria, Rev. 5
S1.RA-ST.SJ-0002(Q)	Inservice Testing - 12 Safety Injection Pump Acceptance Criteria, Rev. 4
S2.OP-PT.SJ-0002(Q)	Safety Injection Pump Flow Test, Modes 5 - 6, Rev. 3
S2.OP-PT.SW-0004(Q)	Service Water Biofouling Monitoring - Safety Injection and Charging Pumps, Rev. 6
S1(2).OP-SO.CVC-0001	Charging, Letdown and Seal Injection
S1(2).OP-SO.CVC-0002	Charging Pump Operations
S1(2).OP-ST.CVC-003	IST for 11/21 Centrifugal Charging Pumps
S1(2).OP-ST.CVC-004	IST for 12/22 Centrifugal Charging Pumps
S1(2).OP-ST.CVC-005	IST for 13/23 Positive Displacement Charging Pumps
S2.OP-ST.SJ-0009(Q)	Emergency Core Cooling ECCS Subsystem - Tavg greater than 350°F, Rev. 5
S2.OP-ST.SJ-0014(Q)	Intermediate Head Cold Leg Throttling Valve Flow Balance Verification, Rev. 12 (Performed November 2000)
S2.OP-ST.SJ-0015(Q)	Intermediate Head Hot Leg Throttling Valve Flow Balance Verification, Rev. 14 (Performed November 2000)
S2.OP-ST.SJ-0016(Q)	High Head Cold Leg Throttling Valve Flow Balance Verification, Rev. 15 (Performed October 2000)
SC.DE-BD.SJ-0001	Safety Injection System
SC.IC-GP.ZZ-0003(Q)	General Instrument Calibration Procedure for Field Devices
SC.MD-GP.ZZ-0178(Q)	Station Preparation for Winter - Electrical, Rev. 7
SC.MD-PM.CVC-0004(Q)	Centrifugal Charging Pump Bearing Inspection and Replacement, Rev. 2
SC.MD-PM.CVC-0001(Q)	Centrifugal Charging Pump Gear Drive Periodic Inspection, Rev. 4
SC.OP-DL.ZZ-0010(Q)	Blocked Instrumentation / Alarms, Unit 1, Attachment 2
SC.OP-DL.ZZ-0010(Q)	Blocked Instrumentation / Alarms, Unit 2, Attachment 2
SC.OP-PT.ZZ-002(Q)	Station Preparation for Winter Conditions, Rev. 4
SC.SA-AP.ZZ-0051	Leakage Monitoring Program, Rev. 21
1-EOP-FRHS-1	Response to a Loss of Secondary Heat Sink, Rev. 21
1-EOP-FRSM-1	Response to Nuclear Power Generation, Rev. 21
1-EOP-LOCA-1	Loss of Reactor Coolant, Rev. 22
1-EOP-LOCA-4	Transfer to Hot Leg Recirculation, Rev. 21
1-EOP-LOPA-1	Loss of All AC Power
1-EOP-LOPA-2	Loss of All AC Power Recovery/SI Not Required
1-EOP-LOPA-3	Loss of All AC Power Recovery/SI Required
1-EOP-SGTR-1	Steam Generator Tube Rupture, Rev. 21

b. Documents Reviewed (Cont.)WORK ORDERS

60005089, 60005473, 60007540, 60009769, 60017898, 60025545, 70004060, 70004685, 70005485, 70006330, 70007872, 70007884, 70008449, 70011238, 70011376, 70011813, 70011904, 70012507, 70013302, 70013444, 70013461, 70014265, 70014326, 70014741, 70015164, 70015210, 70016048, 70016450, 70016728, 70017100, 70017521, 70017524, 70017683, 70017761, 70018424, 70018568, 70020765, 70021007, 70021589, 70022563, 70022987, 960613307, 981006264, 990409214, 990501157, 990526187

MODIFICATIONS

DC No. 80005242	Replacement of Salem Unit 2 Radiation Monitor R11/12
DC No. 80008507	Modification of PORV Control Circuits, Rev. 1, 9/21/00
DC No. 89998507	Modification of Control Circuitry for Valves 1PR1 and 1PR2(PORVs)
TM No. 01-007	Installation of a Temporary Support and Blind Flanges

ENGINEERING CHANGE AUTHORIZATIONS

1EC-3530	Cavitation Mitigation on Safety Injection Cold Leg
1EE-0104	Replacement of Pressure Retaining Trim Set Internals of the PORVs 1PR1 and 1PR2.
1EE-0169	Replacement of Breather Cap of No. 11 & 12 Centrifugal Charging Pump Speed Increasers and Addition of an Oil Drain Valve for Speed Increaser
1EE-0385	Stabilizing No. 12 SI Pump Motor for Excessive Vibration by Addition of Weight

50.59 SCREENING EVALUATIONS

80006212	As-Built Salem Unit 1 Rod Control Voltage Regulator and IRV Relay Wiring
80008246	As-Built Hot Load Setting for HGR FWH-106 & CH-205
80023560	Use-as-is configuration of 1ABS8 Damper (HELB)
80003538	As-Built Configuration of tubing/valves/fittings of Control Air Piping(DCP)
80001627	Isolation Valve from Condensate Polisher Chemical x-fer Pump Dike Area
80009888	Condenser Vacuum Pump Exhaust Total Flow Instrument Design Change
80010287/0288/0289	Implementation of 1.4% Power Upgrade(DCP)
80013111	Salem SPDS Computer Upgrade
80016883	Replacement of C Phase 24/500kV Main Transformer(1CX500)
80019105	Unit 2 Midloop Design Change
80021548	Salem Unit 2 Stator Water Conductivity Recorder Replacement
80027255	Replace Valve 1CV88
80027318	Salem Generator Access Platform Documentation
80028243	Hydrogen and Stator Cooling Schematic Drawing Revision
80029004	Appendix R Cable Reroutes

b. Documents Reviewed (Cont.)50.59 SCREENING EVALUATIONS (Cont.)

80029155	CVCS/BAT Cross-Tie
80029491	Deletion of Salem 1 RMS Channel MCSLAPM
80030171	Hot Shutdown Panel Cross-Tie
80033503	Installing Vents on RHR to SI/Charging Pump Cross Connection Piping for Unit 2

50.59 SAFETY EVALUATIONS

S97-157	Cavitation/Debris Mitigation on Safety Injection and Charging/Safety Injection Lines
S98-072	Stabilizing of No. 12 SI Pump Motor for Excessive Vibration by Addition of Weight
S00-019	Removal of PDP Charging Pump from Service for Normal Operation
S00-049	1PR1 and 1PR2 Control Circuit Modification
S01-001	Mode 3 Steam Line Break UFSAR Text Change
S01-002	NPSH for Salem Service Water Pumps
S01-008	Salem Unit 1 Upgrade of Containment Atmosphere Radiation Monitor
S01-009	Salem Unit 1 Cycle 15 Reload Safety Evaluation for Operation in All Modes
S01-012	Containment Cooling During Refueling
S01-014	Installation of Temporary Support and Blind Flanges to allow SW Bay#3 to be Operable with Spools 1-SW-P-1328/1329 and 1-SW-P-1326/1327 removed
S01-031	Salem Unit 1 Cycle 15 Reload Safety Evaluation for Operation in All Modes
S02-001	Analysis of CVCS Cross-Tie

OPERABILITY DETERMINATION

OD-01-007 S1 RWST	Operability Determination for RWST due to Nozzle Leak
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VENDOR/ OPERATING MANUALS

301119	Reciprocating Charging Pump, Union Pump Co.
301137	Charging Safety Injection Pump/Motor, Westinghouse Electric

CORRECTIVE ACTIONS

20020623, 20038844, 20051143, 20066216, 20061087, 20083417, 20086564

DRAWINGS

203000-S-8789	Units 1 and 2 Generators & Main Transformers One Line Control
203002-A-8789	Unit 1 4160V Vital Buses One Line
203003-A-8789	Unit 1 460V & 230V Vital and Non-Vital Bus One Line Control
203007-A-8789	Unit 1 125V DC One Line

b. Documents Reviewed (Cont.)DRAWINGS (Cont.)

205234-A-8761	Unit 1 Safety Injection P&ID, Sh. 1-4
205334-A-8763	Unit 2 Safety Injection P&ID, Sh. 1-4
207931-A-1776	Unit 1 Penetration Area 1A East Valves One Line Diagram
207932-A-1776	Unit 1 Penetration Area 1B East Valves One Line Diagram
207933-A-1777	Unit 1 Penetration Area 1C East Valves One Line Diagram
211349-B-9511	Unit 1 Control Area 1ADE 28V DC Distribution Cabinet Wiring Diagram
211350-B-9511	Unit 1 Control Area 1BDE 28V DC Distribution Cabinet Wiring Diagram
211351-B-9511	Unit 1 Control Area 1CDE 28V DC Distribution Cabinet Wiring Diagram
211357-B-9511	Unit 1 28V DC One Line Diagram
211577-ABL- 583	Units 1 & 2 CVCS Chg Pump Suct from RWST and Seal Wtr to VCT Isolation Valves Schematic
211578-A-583	Unit 2 CVCS Chg Pump Suct from RWST and Seal Wtr to VCT Isolation Valves Schematic
211579-ABL- 583	Unit 1 & 2 CVCS Chg Pump Suct from RWST and Seal Wtr to VCT Isolation Valves Schematic
211580-A-583	Unit 2 CVCS Chg pump Suct from RWST & Seal Wtr to VCT Isolation Valves Schematic
211637-B-9770	No. 11 & 21 Safety Injection Pumps Schematic
211638-A-	No. 12 & 22 Safety Injection Pumps Schematic
211641-ABL- 587	Units 1 & 2 SI System SI Pump Suction & Discharge Valves Schematic
211642-B- 9770	Units 1 & 2 SI System SI Pump Suction & Discharge Valves Schematic
211643-ABL- 587	Units 1 & 2 SI System SI Control Valves Schematic
211644-ABL- 587	Units 1 & 2 SI System SI Control Valves Schematic
211645-ABL- 587	Units 1 & 2 SI System SI Control Valves Schematic
211646-ABL- 587	Units 1 & 2 SI System SI Control Valves Schematic
211647-ABL- 587	Units 1 & 2 SI System Boron Injection Tk Inlet & Outlet Valves Schematic
211648-B-9770	Units 1 & 2 SI System Boron Injection Tk Inlet & Outlet Valves Schematic
211649-ABL- 587	Units 1 & 2 SI System Boron Injection Tk Inlet & Outlet Valves Schematic
211650-B-9770	Units 1 & 2 SI System Boron Injection Tk Inlet & Outlet Valves Schematic
211651-ABL- 587	Units 1 & 2 SI System Discharge Valve to RCS Schematic
211652-B-9770	Units 1 & 2 SI System Discharge Valve to RCS Schematic
211654-B-9770	Units 1 & 2 SI System Discharge Valve to RCS Schematic
211668-ABL- 587	Units 1 & 2 SI System No. 11 & 21 Accumulator Control Valves Schematic

b. Documents Reviewed (Cont.)DRAWINGS (Cont.)

211669-ABL- 587	Unit 1 SI System No. 11 Accumulator Control Valves Schematic
211672-ABL- 587	Units 1 & 2 SI System No. 12 & 22 Accumulator Control Valves Schematic
211673-ABL- 587	Unit 1 SI System No. 12 Accumulator Control Valves Schematic
217126-ABL-587	Units 1 & 2 SI System No. 13 & 23 Accumulator Control Valves Schematic
217127-A-1255	Unit 1 SI System No. 13 Accumulator Control Valves Schematic
217130-ABL-587	Units 1 & 2 SI System No. 14 & 24 Accumulator Control Valves Schematic
217131-A-1255	Unit 1 SI System No. 14 Accumulator Control Valves Schematic
217139-B-588	Unit 2 SI System Recirculation Interconnection Valve 21SJ113 Schematic
217140-B-588	Unit 2 SI System Recirculation Interconnection Valve 22SJ113 Schematic
217152-ABL-588	Unit 2 SI System SI Pumps 21SJ45 Recirculation Valve Schematic
217156-ABL-588	Units 1 & 2 SI System No. 11 SI Pump Suction & Disch Valves Schematic
217157-B-9770	Units 1 & 2 SI System No. 11S Pump Suction & Disch Valves Schematic
217158-B-588	Unit 2 SI System No. 21 SI Pump Disch Valve to Cold Leg Schematic
218211-A-8901	Unit 2 Aux Bldg RHR & SI Piping Plan Elevation
218865-B-9781	Unit 2 CVCS 22SJ45 Chg Sys Suct From RHR Pumps Valve Schematic
221408-B-9545	Unit 1 Aux Bldg Control Area 1AADC 125V DC Dist Cab Wiring Diagram
221409-B-9545	Unit 1 Aux Bldg Control Area 1BBDC 125V DC Dist Cab Wiring Diagram
221410-B-9545	Unit 1 Aux Bldg Control Area 1CCDC 125V DC Dist Cab Wiring Diagram
223873-A-1212	Unit 1 Yard Refueling Water Storage Tanks Arrangement, Sh. 1 & 2
231357-B-9601	Units 1&2 Pressurizer Power Relief Valves Logic Diagram
239925-B-9648	Units 1&2 SI System No. 11 & 21 SI Pumps Logic Diagram
239926-B-9648	Units 1&2 SI System No. 12 & 22 SI Pumps Logic Diagram
239936-B-9648	Units 1&2 SI System No. 11 Accumulator Outlet Valves Logic Diagram
239937-B-9648	Units 1&2 SI System No. 12 Accumulator Outlet Valves Logic Diagram
239938-B-9648	Units 1&2 SI System No. 13 Accumulator Outlet Valves Logic Diagram
239939-B-9648	Units 1&2 SI System No. 14 Accumulator Outlet Valves Logic Diagram

c. Documents Reviewed (Cont.)DRAWINGS (Cont.)

241106-B-9661	Unit 1 PZR Power Relief & Stop Valves & Overpressure Protection System Channel I Schematic
241107-B-9661	Unit 1 PZR Power Relief & Stop Valves & Overpressure Protection System Channel I Schematic
242881-B-9678	Unit 1 PZR Power Relief & Stop Valves & Overpressure Protection System Channel II Schematic
241882-B-9661	Unit 1 PZR Power Relief & Stop Valves & Overpressure Protection System Channel II Schematic
601231-B-9528	Unit 1 Aux Bldg Control Area 1A-460 Volts Vital Bus One Line Diagram
613357-D-	Unit 1 SI Refueling Water Storage Tank Temp Control Loop Diagram
JND-36425	Refueling Water Storage Tank Design

QA ASSESSMENT FEED BACK

2001-0006	Salem 1R14 Outage Engineering Holds/Issues, dated April 3, 2001
2001-0132	Engineering Process for Leaking Pressurizer Relief Valve (1PR5) Replacement, dated October 1, 2001
2002-0006	Salem 2R12 Outage Preparation, dated January 25, 2002

MISCELLANEOUS

System Function Level Maintenance Rule Scoping vs. Risk Reference
 System Health Reports (Unit 1 and 2: Safety Injection, Chemical & Volume Control, and Reactor Coolant Systems)
 Inservice Test Pump Trend Graphs (Centrifugal Charging and Safety Injection Pumps)
 Test Performance Curves for Nos. 11, 12, 21, 22, Centrifugal Charging and Safety Injection Pumps
 Letter No. LRN-01-0377, Dated December 14, 2991, Refueling Water Storage Tank Salem Generating Station Unit 1, Docket No. 50-272
 NDE Records of RWST: Surface and UT Examinations Order# 60024238
 UFSAR, Section 5, Reactor Coolant System and Connected Systems
 UFSAR, Section 6.3, Emergency Core Cooling System
 TS 4.5.2, Emergency Core Cooling Systems, ECCS Subsystems - T_{avg} 350°F
 TS 3/4.3.2, Engineered Safety Feature Actuation System Instrumentation
 Licensee Event Report 99-006-01, dated July 1, 1999, High Head Safety Injection Flow Balance Discrepancy Noted During Surveillance
 Licensee Event Report 01-002-01, Dated July 27, 2001, Past Non-Compliance With the Auxiliary Building Ventilation Technical Specification Flow Requirements
 DE-CB.SJ-0040, Configuration Baseline Documentation for Safety Injection System
 DE-CB.CVC-0037, Configuration Baseline Documentation for Chemical Volume and Control System
 DE-CB.RC-0042, Configuration Baseline Documentation for Reactor Coolant System
 Salem and Hope Creek Relief Valve Program Self Assessment, dated March 29, 2000
 NOS05FLUNCY-00, (Lesson Plan), License Operator Fluency List

d. Documents Reviewed (Cont.)

MISCELLANEOUS (Cont.)

SGS PSA, Probabilistic Safety Assessment, Rev. 2

Pressurizer System Maintenance History

Safety Injection System Maintenance History

Chemical and Volume Control System Maintenance History

IN 83-55, Misapplication of Valves by Throttling Beyond Design Range

IN 88-23, S5, Potential for Gas Binding of High Pressure Safety Injection Pumps During a Loss-of-Coolant Accident