

April 24, 2006

Mr. William Levis  
Senior Vice President and Chief Nuclear Officer  
PSEG LLC - N09  
P. O. Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000272/2006002 and 05000311/2006002

Dear Mr. Levis:

On March 31, 2006, the US Nuclear Regulatory Commission (NRC) completed an inspection at the Salem Nuclear Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 3, 2006, with you 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. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one self-revealing finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the US Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, US Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Salem Nuclear Generating Station.

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

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Sincerely,

*/RA/*

Mel Gray, Chief  
Projects Branch 3  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000272/2006002 and 05000311/2006002  
w/Attachment: Supplemental Information

cc w/encl:

T. Joyce, Site Vice President - Salem  
D. Winchester, Vice President Nuclear Assessments  
W. F. Sperry, Director Business Support  
D. Benyak, Director - Regulatory Assurance  
C. J. Fricker, Salem Plant Manager  
J. J. Keenan, Esquire  
M. Wetterhahn, Esquire  
F. Pompper, Chief of Police and Emergency Management Coordinator  
P. Baldauf, Assistant Director, Radiation Protection and Release Prevention, State of New Jersey  
K. Tosch, Chief, Bureau of Nuclear Engineering, NJ Dept. of Environmental Protection  
H. Otto, Ph.D., DNREC Division of Water Resources, State of Delaware  
Consumer Advocate, Office of Consumer Advocate  
N. Cohen, Coordinator - Unplug Salem Campaign  
W. Costanzo, Technical Advisor - Jersey Shore Nuclear Watch  
E. Zobian, Coordinator - Jersey Shore Anti Nuclear Alliance

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos: 50-272, 50-311

License Nos: DPR-70, DPR-75

Report No: 05000272/2006002, 05000311/2006002

Licensee: Public Service Enterprise Group Nuclear LLC

Facility: Salem Nuclear Generating Station, Units 1 & 2

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

Dates: January 1, 2006 through March 31, 2006

Inspectors: J. Daniel Orr, Senior Resident Inspector  
Harry Balian, Resident Inspector  
Joseph G. Schoppy, Jr., Senior Reactor Inspector  
Joseph T. Furia, Senior Health Physicist  
Joel S. Wiebe, Project Engineer  
Dante Johnson, Reactor Inspector  
Jeffrey Josey, Reactor Inspector

Approved By: Mel Gray, Chief  
Projects Branch 3  
Division of Reactor Projects

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## SUMMARY OF FINDINGS

IR 05000272/2006002, 05000311/2006002; 01/01/2006 - 03/31/2006; Salem Nuclear Generating Station Units 1 and 2; Maintenance Effectiveness.

The report covered a 13-week period of inspection by resident inspectors and announced inspections by regional radiation and maintenance rule inspectors. One Green non-cited violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. NRC-Identified and Self-Revealing Findings

#### **Cornerstone: Barrier Integrity**

- C. Green. A self-revealing, non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified. PSEG maintenance personnel omitted procedure steps to obtain motor vibration data at the conclusion of 11 containment fan coil unit (CFCU) preventive maintenance, and the 11 CFCU motor outboard bearing subsequently failed. PSEG initiated actions to correct this post-maintenance testing problem.

The finding is more than minor because it affected the human performance attribute of the barrier integrity cornerstone objective to provide reasonable assurance that containment barriers protect the public from radionuclide releases caused by accidents or events. The 11 CFCU was unavailable for about 92.5 hours. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors were directed to IMC 0609, Appendix H, "Containment Integrity Significance Determination Process," because the finding represented an actual loss of defense-in-depth of a system that controls containment pressure. The finding was determined to be of very low safety significance (Green) because the Salem Units include a large, dry containment and containment fan coil unit failures do not significantly contribute to large early release frequency. The performance deficiency had a human performance cross-cutting aspect. (Section 1R12)

### B. Licensee-Identified Violations

None.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the period at 100 percent (%) power. Consistent with procedures and pre-developed contingencies, operators reduced power to 55% on February 8, 2006, when a 12 steam generator feed pump (SGFP) electronic controls power supply swapped to its battery backup power source. PSEG restored the power supply to an AC source via a temporary modification and returned the unit to 100% power on February 9, 2006. Operators reduced power to 55% on February 17, 2006, to facilitate a permanent repair to the power source for the 12 SGFP controls. Operators returned the unit to 100% on the same day.

On March 8, 2006, Salem Unit 1 received an automatic reactor trip from a turbine trip condition that was caused by an anomalous turbine electronic overspeed signal. Operators stabilized the plant in hot standby conditions. PSEG determined that the most likely cause of the electronic overspeed signal was electromagnetic or radio-frequency interference, but could not identify the exact source. Operators established the reactor critical on March 9, 2006, and synchronized the main generator to the grid the same day. The plant reached full power on March 10, 2006, and remained at 100% power for the remainder of the inspection period.

Unit 2 began the period at 100% power. Unit 2 was reduced to 55% reactor power on March 24, 2006, for planned maintenance on the 21 and 22 SGFPs. Unit 2 returned to 100% power on March 28, 2006.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity**

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown (4 samples)

a. Inspection Scope

The inspectors performed a partial walkdown of three systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors also performed an additional partial walkdown of the charging system positive displacement pumps which support safe shutdown of the opposite Salem unit during several postulated fire scenarios. The inspectors focused their review on potential discrepancies that could impact the function of the system, and therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down control systems components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that PSEG had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program.

Documents reviewed are listed in the attachment. The following four systems were walked down:

- C Unit 1 service water (SW) system during the 15 SW pump outage;
- C Unit 1 and Unit 2 charging system positive displacement pumps and boric acid storage tanks;
- C Unit 1 auxiliary feedwater (AFW) system during the 13 AFW pump outage; and
- C Unit 2 spent fuel pool (SFP) cooling system while the Unit 1 SFP cooling system was out of service to support replacement of component cooling (CC) water valve 1CC37.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown (1 sample)

a. Inspection Scope

The inspectors performed one complete walkdown of accessible portions of the Salem Unit 1 safety injection system to verify that the system was properly configured, hangers and supports correctly installed and functional, pump and motor oil reservoir levels were normal, and to identify any discrepancies between the existing lineup and the prescribed lineup, including locked valve requirements. The inspectors interviewed the system engineer and reviewed corrective action evaluations associated with the system. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (711111.05)

a. Inspection Scope (13 samples)

The inspectors walked down thirteen fire areas to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with PSEG's administrative procedures; fire detection and suppression equipment was available for use; that passive fire barriers were maintained in good material condition; and that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with PSEG's fire plan. Documents reviewed are listed in the attachment. The following fire areas were inspected:

- Unit 1 and Unit 2 outer piping penetration areas;
- Unit 1 and Unit 2 common main control room;
- C Unit 1 and Unit 2 4160Vac vital switchgear rooms;



- C Unit 1 and Unit 2 service water intake structures;
- C Unit 1 and Unit 2 chemical volume control system hold-up tank areas;
- C Unit 1 and Unit 2 charging pump and spray additive tank areas; and
- C Unit 1 and Unit 2 auxiliary building ventilation areas.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope (1 sample)

Resident Inspector Quarterly Review. The inspectors observed a simulator training scenario conducted on January 30, 2006, to assess operator performance and training effectiveness. The scenario involved a fire in the 2A emergency diesel generator, loss of the 22 containment fan coil unit, loss of the 2B 4kVac vital bus caused by an earthquake, reactor trip and a temporary loss of all steam generator feedwater flow. The inspectors verified operator actions were consistent with operating, alarm response, abnormal, and emergency procedures. The inspectors assessed simulator fidelity and verified that evaluators identified deficient operator performance where appropriate. The inspectors observed the simulator instructors' critique of operator performance. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Biennial Review (71111.12B)

a. Inspection Scope (6 samples)

The inspectors reviewed PSEG's periodic evaluation of implementation of the maintenance rule as required by 10 CFR 50.65(a)(3). The evaluation covered July 2003 to May 2005. The purpose of this review was to ensure that Salem established appropriate goals, and effectively assessed system performance and preventive maintenance activities. The inspectors verified that the evaluation was completed within the required time period and that industry operating experience was utilized, where applicable. Additionally, the inspectors verified that Salem appropriately balanced equipment reliability and availability and made adjustments when appropriate.

The inspectors selected a sample of six risk-significant systems to verify that: (1) the structures, systems, and components were properly characterized, (2) goals and performance criteria were appropriate, (3) corrective action plans were adequate, and

(4) performance was being effectively monitored in accordance with station procedures. The following systems were selected for this detailed review:

- C Gas turbine generator;
- C Control air system;
- C Service water system;
- C Feed and condensate system;
- C Radiation monitoring system; and
- C Chemical and volume control system.

These systems were either in (a)(1) status, had been in (a)(1) status for some time, or experienced degraded performance during the assessment period. The inspectors reviewed corrective action documents for malfunctions and failures of these systems to determine if system failures were correctly categorized. The inspectors also verified that overall system performance was monitored and appropriately characterized within maintenance rule requirements.

The inspectors interviewed the maintenance rule program owner and system engineers, reviewed documentation for applicable systems, and reviewed a sample of condition reports. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Resident Inspector Quarterly Review

a. Inspection Scope (2 samples)

The inspectors reviewed performance monitoring and maintenance effectiveness issues for the Salem Unit 1 and Unit 2 safety injection systems and an 11 containment fan coil unit (CFCU) failure documented in PSEG notification 20262691. The inspectors assessed whether PSEG was adequately monitoring equipment performance to ensure that preventive maintenance was effective. The inspectors verified that the components were monitored in accordance with the maintenance rule (MR) program requirements. The inspectors compared documented functional failure determinations and unavailability hours to those being tracked by PSEG to evaluate the effectiveness of PSEG's condition monitoring activities and to determine whether performance goals were being met. The inspectors reviewed applicable work orders, corrective action notifications, preventive maintenance tasks, and system health reports. The inspectors also interviewed pertinent engineers. Documents reviewed are listed in the attachment.

b. Findings

Introduction: A Green, self-revealing NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified. PSEG maintenance personnel

omitted procedure steps to obtain motor vibration data at the conclusion of 11 CFCU preventive maintenance, and the 11 CFCU motor outboard bearing subsequently failed.

Description: On October 31, 2005, during the seventeenth Unit 1 refueling outage (1R17), PSEG performed a fifteen year environmental qualification (EQ) preventive maintenance (PM) activity under work order 40002082. The EQ PM required motor disassembly, cleaning of motor internals, and bearing replacements. Technicians utilized maintenance procedure SC.MD-CM.CBV-0001, "Removal and Installation of CFCU Motor, Bearing Replacement, and Motor Power Lead Insulation," Revision 8 and recorded the as-found conditions as satisfactory. Maintenance personnel omitted procedure steps to replace the motor bearings based on satisfactory visual inspections. The motor bearing housings were removed and reinstalled to facilitate the bearing visual inspections. After refueling outage associated maintenance activities, the 11 CFCU was returned to service on November 1, 2005.

On November 25, 2005, at 4:48 p.m. control room operators received a process computer alarm at 185 degrees Fahrenheit (EF) for the 11 CFCU outboard motor bearing. The bearing temperature rose to 385EF from 130EF in about three minutes. The temperature eventually increased to 700EF. At 7:19 p.m., control room operators secured the 11 CFCU and declared it inoperable. PSEG maintenance technicians entered the containment building and observed blistered and blackened paint at the 11 CFCU motor outboard bearing. PSEG replaced the 11 CFCU motor and shipped the failed motor to a vendor for analysis. The 11 CFCU was returned to an operable status with a new motor installed on November 29, 2005, at 6:15 p.m.

PSEG entered this issue into the corrective action program as notifications 20263496 and 20262691 and performed an apparent cause evaluation (ACE). ACE 70052064 included the vendor analysis results and identified maintenance procedure inadequacies. The ACE also documented an initial review of the operator response to the process computer alarm and initiated corrective actions for further review of the operator response.

The ACE concluded that the tip of the outboard bearing thermocouple was pinched between the bearing housing seat and the bearing outer race, thereby causing a misalignment of the bearing relative to the housing bore. PSEG determined that the outboard bearing housing was improperly assembled during work order 40002082. The bearing thermocouple design included a spring-loaded adapter to hold the thermocouple firmly against the bearing outer race. When the tip of the thermocouple did not rest against the bearing outer race, the force of the spring pushed the tip inward about 0.250 inches. As the outboard bearing bracket was reinstalled, the inwardly protruding thermocouple tip was pinched between the housing seat and the bearing outer race. The cocked motor bearing resulted in the 11 CFCU failure on November 25, 2005. PSEG concluded that SC.MD-CM.CBV-0001, "Removal and Installation of CFCU Motor, Bearing Replacement, and Motor Power Lead Insulation," Revision 8 was inadequate, because it did not specify bearing thermocouple removal prior to performing motor disassembly. The inspectors noted that the Reactor Containment Fan Cooler Technical

Manual, vendor technical document 139970, did not describe motor disassembly to the level of detail that included spring-loaded thermocouple interference.

ACE 70052064 also included details that post-maintenance testing was inadequate because vibration analysis was not prescribed in the work order activities. The inspectors identified that the omission was contrary to SC.MD-CM.CBV-0001, "Removal and Installation of CFCU Motor, Bearing Replacement, and Motor Power Lead Insulation," Revision 8, steps 5.5.1.R.3, 5.5.1.S.3, 5.5.1.AA.3, and 5.5.1.AC.3, which required vibration data collection during uncoupled and coupled motor/fan runs in both high and low speeds. The inspectors ascertained through interviews that the vibration data procedure steps were omitted on the basis that the motor bearings were not replaced. The inspectors considered the omissions inappropriate because the bearing housings were disturbed, and concluded vibration data would be expected to indicate a problem, such as a misaligned bearing.

Analysis: The failure to accomplish maintenance activities in accordance with instructions described in SC.MD-CM.CBV-0001, "Removal and Installation of CFCU Motor, Bearing Replacement, and Motor Power Lead Insulation," Revision 8, steps 5.5.1.R.3, 5.5.1.S.3, 5.5.1.AA.3, and 5.5.1.AC.3 is a performance deficiency. The finding is more than minor because it affected the human performance attribute of the barrier integrity cornerstone objective to provide reasonable assurance that containment barriers protect the public from radionuclide releases caused by accidents or events. The 11 CFCU was unavailable for about 92.5 hours. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors were directed to IMC 0609, Appendix H, "Containment Integrity Significance Determination Process," because the finding represented an actual loss of defense-in-depth of a system that controls containment pressure. The finding was determined to be of very low safety significance (Green) because the Salem Units include a large, dry containment and containment fan coil unit failures do not significantly contribute to large early release frequency. The performance deficiency had a human performance cross-cutting aspect.

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, and drawings. Contrary to the above, on October 31, 2005, post-maintenance vibration data was not collected for the 11 CFCU in accordance with procedure steps 5.5.1.R.3, 5.5.1.S.3, 5.5.1.AA.3, and 5.5.1.AC.3 of SC.MD-CM.CBV-0001, "Removal and Installation of CFCU Motor, Bearing Replacement, and Motor Power Lead Insulation," Revision 8. Because this finding is of very low safety significance and has been entered into PSEG's corrective action program in notifications 20263496 and 20262691, this violation is being treated as an NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000272/2006002-01, Inadequate Maintenance Practices Result in Unavailability of the 11 Containment Fan Coil Unit)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)a. Inspection Scope (6 samples)

The inspectors reviewed six maintenance activities to verify that the appropriate risk assessments were performed as required by 10 CFR 50.65(a)(4) prior to removing equipment for work. The inspectors reviewed the applicable risk evaluations, work schedules and control room logs for these configurations to verify that concurrent planned, and emergent maintenance and test activities did not adversely affect the plant risk already incurred with these configurations. PSEG's risk management actions were reviewed during shift turnover meetings, control room tours, and plant walkdowns. The inspectors also used PSEG's on-line risk monitor (Equipment Out Of Service Workstation) to evaluate the risk associated with the plant configuration and to assess PSEG's risk management. Documents reviewed are listed in the attachment. The following plant configurations were assessed:

- C Unit 3 gas turbine generator, 15 service water pump, 11 component cooling water heat exchanger, No. 2 station air compressor, and No. 2 station power transformer outage;
- C 11 residual heat removal pump outage;
- C 23 control room chiller and 26 service water pump outage;
- C 12 residual heat removal pump, 12 steam generator feed pump, and 1B1 28Vdc battery charger outage;
- C No. 2 station air compressor outage and pending 11 station power transformer work; and
- C 2A emergency diesel generator outage.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events (71111.14)a. Inspection Scope (3 samples)

The inspectors evaluated operator performance in coping with a Unit 2 chill water expansion tank level low-out-of-sight condition on January 24, 2006, and a Unit 1 uncomplicated automatic reactor trip on March 8, 2006. The chill water expansion tank level control problem occurred as the result of clogged makeup filters combined with excessive system leakage. The automatic reactor trip was generated from a turbine trip condition spuriously initiated by an electrical turbine overspeed trip signal. The inspectors also observed operators during the conduct of a Unit 1 planned downpower to 55% reactor power on February 17, 2006, to facilitate repair of the 14 Miscellaneous AC electrical distribution panel and power supply. For each event, the inspectors reviewed main control room operator logs, plant computer data, and chart recorders to verify the expected plant response. The inspectors also interviewed control room

operators and reviewed plant procedures to assess operator performance. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (6 samples)

The inspectors reviewed six operability determinations for degraded or non-conforming conditions associated with:

- C Notification 20271899, 1C emergency diesel generator service water flow rate well below expected value;
- C Condition report (NUCR) 70053556, operability determination (OD) for emergency core cooling systems due to check valve leakage;
- C NUCR 70052885, OD for 14 containment fan coil unit with service water valve 14SW65 failed open;
- C NUCR 70052139, OD for number 4 service water bay with outside air dampers SWV3 failed fully open and SWV4 failed partially open;
- C NUCR 70053033, OD for containment and containment ventilation system following failure of a temporary modification to the containment ventilation system; and
- C Notification 20272908, 21 chiller operation with excessive back leakage through associated service water check valve 21SW99.

The inspectors reviewed the technical adequacy of the operability determinations to ensure that technical specification operability and technical conclusions were justified. Inspectors verified that no unrecognized increase in risk occurred due to the listed conditions. The inspectors also walked down accessible equipment to corroborate the adequacy of PSEG's operability determinations. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (6 samples)

The inspectors observed portions of and/or reviewed results of six post-maintenance tests for the following equipment:

- Work order (WO) 30024903, diagnostic testing of 12RH4 motor operated valve;



- WO 30059159, diagnostic testing of 12CC16 motor operated valve;
- WO 60035202, install high voltage shutdown board in 1B1 28Vdc battery charger;
- WOs 30079959, 30133952, 30101482, 40020162, 40022243, 30012676, 30079959, 30133952, 60041669, 50036534, 50036455, 50063609, and 50083049, planned maintenance of 15 containment fan coil unit;
- WOs 30128164, 30129161, 60061042, and 30082710, planned maintenance of 23 control room chill water compressor; and
- WOs 30131431, 50092784, 30109701, and 30116926, planned maintenance of 11 service water pump.

The inspectors assessed whether: (1) the effect of testing on the plant had been adequately addressed by control room and engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness, consistent with design and licensing basis documentation; (4) test instrumentation had current calibration, range, and accuracy for the application; (5) tests were performed, as written, with applicable prerequisites satisfied; and (6) equipment was returned to an operational status and ready to perform its safety function. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope (1 partial sample)

On March 8 and 9, 2006, the inspectors reviewed the Unit 1 forced outage work scope associated with an automatic reactor trip on March 8, 2006. The inspectors confirmed that PSEG appropriately considered shutdown plant risk and maintained defense-in-depth systems while Unit 1 remained in hot standby conditions. The inspectors walked down the reactor containment, reviewed PSEG's post-reactor trip review and apparent cause reports, and observed the reactor startup to criticality. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (8 samples)

The inspectors observed portions of and/or reviewed results for eight surveillance tests to verify, as appropriate, whether the applicable system requirements for operability were adequately incorporated into the procedures and that test acceptance criteria were

consistent with procedure requirements, the technical specification requirements, the UFSAR, and ASME Section XI for pump and valve testing. Documents reviewed are listed in the attachment. The following surveillance tests were inspected:

- C Work Order (WO) 50091614, S2.OP-ST.CVC-0003, Inservice Testing - 21 Charging Pump, Revision 19;
- C WO 50092685, S2.OP-ST.CVC-0005, Inservice Testing - 23 Charging Pump, Revision 16;
- C Reactor Coolant System Water Inventory Balance, S1.OP-ST.RC-0008, Rev. 26;
- C WO 50091498, S2.OP-ST.AF-0001, Inservice Testing - 21 Auxiliary Feedwater Pump, Revision 15;
- C WO 50079445, S2.IC-CC.AF-0218, 2FA-1095 23 Steam Generator Auxiliary Feedwater Flow, Revision 8;
- C WO 50091591, S1.OP-ST.CS-0003, Inservice Testing - Containment Spray Valves, Revision 4;
- C WO 50091409, S1.OP-ST.DG-0005, 12 Fuel Oil Transfer System Operability Test, Revision 22; and
- C WOs 30134569 and 30132936, S1.OP-PT.CA-0001, Emergency Control Air Compressor Functional Test, Revision 15.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope (2 samples)

The inspectors reviewed two temporary modifications and assessed whether PSEG followed its administrative process for implementing the modifications, NC.DE-AP.ZZ-0030, "Control of Temporary Modifications." The associated 10 CFR 50.59 screenings within each temporary modification package were compared against the UFSAR and technical specifications. Temporary modifications were walked down and verified installed in accordance with the modification documents, and post-installation testing was verified to assure that the actual impact on permanent systems was adequately verified by the tests. Documents reviewed are listed in the attachment. The following temporary modifications were inspected:

- C TM 06-003, Install Encapsulation with Reach Rod on the 23 Charging Pump Suction Valve S2CVC-2CV57; and
- C TM ST1-06-006, Alternate 115V ac Power Supply to Uninterruptible Power Supply S1CN-1Fq20027.

b. Findings

No findings of significance were identified.



### **Cornerstone: Emergency Preparedness [EP]**

#### 1EP6 Drill Evaluation (71114.06)

##### a. Inspection Scope (1 sample)

The inspectors observed one EP drill from the control room simulator and the Emergency Offsite Facility on February 15, 2006. The inspectors evaluated drill performance relative to developing event classifications and implementation of notifications. The inspectors reviewed the Salem Event Classification Guides and Emergency Plans. The inspectors referenced Nuclear Energy Institute 99-02, Regulatory Assessment Performance Indicator (PI) Guideline, Revision 3, and verified that PSEG correctly counted this drill's contribution to the NRC PI for Drill and Exercise Performance.

##### b. Findings

No findings of significance were identified.

## **2. RADIATION SAFETY**

### **Cornerstone: Occupational Radiation Safety [OS]**

#### 2OS1 Access Control to Radiologically Significant Areas (71121.01)

##### a. Inspection Scope (7 Samples)

The inspectors conducted a review of all PSEG performance indicators for the Occupational Exposure Cornerstone.

The inspectors identified exposure significant work areas within radiation areas, high radiation areas (<1 R/hr), or airborne radioactivity areas in the plant and reviewed associated PSEG controls and surveys of these areas to determine if controls, such as surveys, postings, or barricades were acceptable. The inspectors walked down these areas or the perimeters and verified that radiation work permits, procedures, and engineering controls, surveys, postings, and air samplers were appropriately utilized.

The inspectors examined PSEG's physical and programmatic controls for highly activated or contaminated non-fuel materials stored within the spent fuel pool.

The inspectors discussed with the Radiation Protection Manager high dose rate - high radiation areas, and very high radiation areas (VHRA) controls and procedures. The inspectors verified that any changes to PSEG procedures did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with first-line health physics supervisors the controls in place for special areas that have the potential to become VHRA during certain plant operations. The inspectors determined that these plant operations required communication beforehand with the radiation protection group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors reviewed and assessed the adequacy of PSEG's internal dose assessment for any actual internal exposure greater than 50 mrem Committed Effective Dose Equivalent.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope (2 Samples)

The inspectors reviewed the assumptions and bases for the current annual collective exposure estimate. The inspectors reviewed applicable procedures to determine the method for estimating work activity-specific exposures and the intended dose outcome.

The inspectors reviewed PSEG's method for adjusting exposure estimates or re-planning work when changes in scope or emergent work occurred.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope (1 Sample)

The inspectors verified the calibration expiration and source response check currency on radiation detection instruments staged for use.

b. Findings

No findings of significance were identified.

**Cornerstone: Public Radiation Safety [PS]**2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)a. Inspection Scope (10 Samples)

The inspectors reviewed the most current Radiological Effluent Release Report to verify that a program was implemented as described in Radiological Effluent Technical Specification/Offsite Dose Calculation Manual (RETS/ODCM). The inspectors reviewed the RETS/ODCM report for significant changes to the ODCM and to radioactive waste system design and operation and verified that changes to the ODCM made in accordance with Regulatory Guide 1.109 and NUREG-0133 and were technically justified and documented. The inspectors assessed whether modifications made to radioactive waste system design and operation changed the dose consequence to the public and verified that technical and 10 CFR 50.59 reviews were performed when required. The inspectors reviewed radioactive liquid and gaseous effluent radiation monitor setpoint calculation methodology changes since completion of the modifications. The inspectors determined that anomalous results reported in the current Radiological Effluent Release Report were adequately resolved. The inspectors reviewed the RETS/ODCM to identify the effluent radiation monitoring systems and flow measurement devices, reviewed effluent radiological occurrence performance indicator incidents for onsite follow-up, reviewed PSEG self assessments, audits, and licensee event reports that involved unanticipated offsite releases of radioactive material, and reviewed the UFSAR description of all radioactive waste systems.

The inspectors walked down major components of the gaseous and liquid release systems such as radiation and flow monitors, demineralizers, filters, tanks, and vessels. The inspectors observed current system configuration with respect to the description in the UFSAR, ongoing activities, and equipment material condition.

The inspectors observed routine processing, including sample collection, analysis, and release of radioactive liquid waste to verify that appropriate treatment equipment was used and that radioactive liquid waste was processed and released in accordance with procedure requirements. The inspectors observed the sampling and compositing of liquid effluent samples. In lieu of direct observation, the inspectors reviewed several radioactive liquid waste release permits, including the projected doses to members of the public. The inspectors also observed routine processing, including sample collection and analysis, and radioactive gaseous effluent releases and verified that appropriate treatment equipment was used and that the radioactive gaseous effluent was processed and released in accordance with RETS/ODCM requirements.

The inspectors reviewed the records of any abnormal releases or releases made with inoperable effluent radiation monitors and reviewed PSEG's actions for these releases to ensure an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment.

The inspectors reviewed changes made by PSEG to the ODCM as well as to the liquid or gaseous radioactive waste system design, procedures, or operation since the last inspection. For each system modification and each ODCM revision that impacted effluent monitoring or release controls, the inspectors reviewed PSEG's technical justification and determined whether the changes affected PSEG's ability to maintain effluents ALARA and whether changes made to monitoring instrumentation resulted in a non-representative monitoring of effluents.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that PSEG properly calculated the offsite dose from radiological effluent releases and to determine if any annual Technical Specification (TS)/ODCM (i.e., Appendix I to 10 CFR Part 50 values) were exceeded and, if appropriate, issued a Performance Indicator (PI) report.

The inspectors reviewed air cleaning system surveillance test results and PSEG specific methodology to ensure that the system was operating within PSEG acceptance criteria. The inspectors also reviewed surveillance test results and methodology to determine stack and vent flow rates and verified that the flow rates were consistent with RETS/ODCM or UFSAR values.

The inspectors reviewed instrument calibration records performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device and reviewed completed system modifications and the current effluent radiation monitor alarm setpoint value for agreement with RETS/ODCM requirements. The inspectors also reviewed counting room instrumentation calibration records associated with effluent monitoring and release activities. The inspectors reviewed quality control records for the radiation measurement instruments.

The inspectors reviewed the results of the interlaboratory comparison program and verified the quality of radioactive effluent sample analyses performed by PSEG, reviewed PSEG's quality control evaluation of the interlaboratory comparison test and associated corrective actions for any deficiencies identified, and reviewed the results of QA audits to verify that PSEG met the requirements of the RETS/ODCM.

The inspectors reviewed licensee event reports, special reports, audits, and self assessments related to the RETS/ODCM program performed since the last inspection. The inspectors determined that identified problems were entered into the corrective action program for resolution. The inspectors also reviewed corrective action reports affecting environmental sampling, sample analysis, or meteorological monitoring instrumentation.

The inspectors also reviewed the Salem ground water remediation system, including system components, analytical results and dose calculations, as described in Part II, Section 1.5 of the ODCM.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES [OA]**4OA1 Performance Indicator (PI) Verification (71151)d. Inspection Scope (4 samples)Cornerstone: Mitigating Systems

The inspectors sampled PSEG submittals for the two PIs listed below for Units 1 and 2. For each PI, the inspectors reviewed the period from first quarter 2004 through fourth quarter 2005. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline, " Revision 3, were used to verify the reporting basis for each data element.

C Safety System Unavailability: High Pressure Injection System

C Safety System Unavailability: Emergency AC Power System

The inspectors reviewed PSEG unavailability tracking documents, performed searches in the work management system for pertinent equipment issues, and reviewed the PSEG maintenance rule database to verify accuracy of the reported data.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152).1 Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for followup, the inspectors performed screening of all items entered into PSEG's corrective action program. This was accomplished by reviewing the description of each new notification.

.2 Annual Sample: Review of Charging Pump Discharge Check Valve Back Leakagea. Inspection Scope

The inspectors reviewed PSEG's actions to resolve back leakage associated with the Salem Unit 1 and Unit 2 charging pump discharge check valves. The Salem Unit 1 and 2 designs incorporate three high pressure charging pumps: two safety-related centrifugal pumps and one non-safety-related positive displacement pump. These

pumps are in parallel discharging to a common header. During normal plant operation only one charging pump is operated. Each pump has a discharge check valve to prevent back-flow should the pump be idle. Preventing significant back-flow is required to maintain design flow to the charging and safety injection systems. On several occasions, control room operators identified back leakage during routine pump swaps or pump surveillance tests. NRC inspectors reviewed and documented recent charging pump check valve issues in NRC Inspection Reports 05000272&311/2004004 Section 1R22, 05000272&311/2004005 Section 4OA5.4, 05000272&311/2005003 Section 1R12, and 05000354, 272&311/2005012 Section 4OA2.2. On February 1, 2006, control room operators identified potential back leakage through the 21 and 22 charging pumps. The operators measured the combined back leakage at 8.8 gallons per minute (gpm). Control room operators effectively utilized operating procedures and an established adverse condition monitoring plan to identify the condition. Specifically, for a routine pump swap, the operating 23 charging pump was isolated from the 21 and 22 charging pumps by closing the 21 and 22 charging pump discharge flow control valve. The operators then noticed an 8.8 gpm increase in charging flow from the 23 charging pump. Documents reviewed by the inspectors are listed in the attachment.

b. Findings and Observations

No findings of significance were identified.

PSEG performed an evaluation of the charging pump discharge check valve back leakage and appropriately considered all Unit 1 and Unit 2 past issues as well as identical valves potentially installed in other systems. The evaluation was documented in order 70040263. The inspectors concluded the evaluation was technically thorough. PSEG self-identified prior opportunities to resolve the back leakage issue and recognized delay of some corrective actions from prior valve issues. Planned preventive maintenance activities were re-scheduled, and 100% completion was intended for the next refueling outages.

PSEG performed an operability determination of the most recent issue affecting the 21 and 22 charging pumps in order 70040263. The inspectors reviewed the operability of the Unit 2 charging system in section 1R15 of this report and did not identify any issues with PSEG's operability determination.

.3 Safety Conscious Work Environment Metric Review

a. Inspection Scope

The inspectors reviewed PSEG's progress in addressing safety conscious work environment (SCWE) issues that were discussed in the NRC's annual assessment letter dated March 3, 2006. In that letter, the NRC staff documented a SCWE substantive cross-cutting issue and stated the NRC's intention to continue to monitor progress in this area.

On February 23, 2006, and March 1, 2006, the inspectors conducted a sampling review of PSEG's SCWE Metrics, or performance indicators (PIs), for fourth quarter 2005. Documents reviewed are listed in the attachment.

b. Findings and Observations

No findings of significance were identified.

In fourth quarter 2005, PSEG identified twenty-one PIs as being green or satisfactory while eight PIs were identified as red or needing improvement. In 2005, the PIs have shown improvement from the first quarter results of seventeen green PIs and thirteen red PIs. A PI that monitored management attendance at SCWE training was eliminated because the training was completed.

4OA3 Event Followup (71153 - 2 samples)

.1 Salem Unit 1 Reactor Trip - March 8, 2006

a. Inspection Scope

The inspectors responded to an automatic reactor trip that occurred on March 8, 2006. The inspectors observed control room operators establish stable hot-standby conditions. The inspectors walked down all control board indications for abnormalities, walked down the auxiliary feedwater system, and later interviewed operators for additional insights on equipment performance.

The inspectors further discussed the reactor trip with PSEG's investigation team, managers, and engineers. The inspectors reviewed the initial investigation report and the post-reactor trip report, and observed a station operations review committee on restart issues.

PSEG's initial investigation determined that the reactor trip was caused by a turbine trip condition due to an anomalous turbine electrical overspeed signal. The turbine trip signal was most likely the result of electromagnetic (EMI) or radio-frequency interference (RFI), but the exact EMI or RFI source could not be located. PSEG completed short-term corrective actions to expand the areas in which the use of radios is not permitted. As a long-term corrective action, PSEG chartered a formal root cause analysis team to further review the reactor trip and potential EMI or RFI condition, under evaluation order 70054731.

Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 (Closed) Licensee Event Report (LER) 05000272/2005005-00, 11 Safety Injection Pump Discharge Valve Found Shut

On November 8, 2005, at the start of an 11 safety injection pump surveillance test, equipment operators discovered the associated pump discharge valve (11SJ35) closed. PSEG subsequently determined the valve was left closed at the conclusion of an unrelated surveillance test on November 3, 2005, due to human performance errors. That issue was discussed in section 1R04 of NRC Inspection Report 05000272&311/2005005. This LER was reviewed by the inspectors, and with the exception of the human performance issue discussed in the aforementioned inspection report, no findings of significance were identified. PSEG documented the human performance issue in notification 20260710. This LER is closed.

4OA6 Meetings, Including Exit

On April 3, 2006, the resident inspectors presented the inspection results to Mr. W. Levis and Mr. C. Fricker. None of the information reviewed by the inspectors was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION



**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee personnel:

W. Levis, Senior Vice President and Chief Nuclear Officer  
T. Joyce, Salem Vice President  
C. Fricker, Salem Plant Manager  
S. Robitzski, Salem Engineering Director  
T. Gierich, Salem Operations Manager  
J. Stone, Salem Maintenance Director  
G. Sosson, Salem System Engineering Manager  
A. Roberts, Manager - Engineering Programs  
R. Gary, Salem Technical Superintendent - Radiation Protection  
S. Mannon, Salem Regulatory Assurance Manager  
D. Boyle, Maintenance Rule Program Owner  
A. Roberts, Manager - Engineering Programs  
H. Berrick, Nuclear Licensing/Compliance  
J. D'Sousa, Technical Specialist-ODCM

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened/Closed

05000272/2006002-01      NCV      Inadequate Maintenance Practices Result in Unavailability of the 11 Containment Fan Coil Unit (Section 1R12)

Closed

05000272/2005005-00      LER      11 Safety Injection Pump Discharge Valve Found Shut (Section 4OA3)

**LIST OF DOCUMENTS REVIEWED**

In addition to the documents identified in the body of this report, the inspectors reviewed the following documents and records:

**Section 1R04: Equipment Alignment**

Procedures

S1.OP-SO.SW-0005, Service Water System Operation, Revision (Rev.) 33  
SH.OP-AP.ZZ-0103, Component Configuration Control, Rev. 10

S1.OP-ST.AF-0008, Auxiliary Feedwater Valve Verification Modes 1 - 3, Rev. 3  
S1.OP-SO.SF-0002, Spent Fuel Cooling System Operation, Rev. 17  
S1.OP-AR.ZZ-0003, SFP Temperature High alarm response, Rev. 14  
S1.OP-AB.SF-0001, Loss of Spent Fuel Pool Cooling, Rev. 6  
S1.OP-PT.CVC-0003, Appendix R Testing - 13 Charging Pump, Rev. 0  
S1.OP-SO.CVC-0023, CVCS Cross-Connect Alignment to Unit 2, Rev. 5  
S2.OP-PT.CVC-0003, Appendix R Testing - 23 Charging Pump, Rev. 0  
S2.OP-SO.CVC-0023, CVCS Cross-Connect Alignment to Unit 1, Rev. 6

Drawings

205234, 205328, 205232

Notifications

20269027, 20266944, 20266897, 20266768, 20266896, 20273398, 20273733, 20271570,  
20271569

Other Documents

Unit 1 Safety Injection System Lineup (Lineup ID 816)  
Unit 1 Auxiliary Feedwater System Lineup (Lineup ID 728)

**Section 1R05: Fire Protection**

Procedures

FRS-II-421, Pre-Fire Plan U1 & U2 4160 V Switchgear Rooms and Battery Rooms , Rev. 5  
FRS-II-452, Pre-Fire Plan U1 & U2 Control Room Area, Rev. 5  
FRS-II-914, Pre-Fire Plan U1 & U2 Outer Penetration Area, Rev. 2  
FRS-II-911, Pre-Fire Plan U1 & U2 Service Water Intake Structure, Rev. 2  
FRS-II-424, Pre-Fire Plan U1 & U2 CVCS Hold-up Tank Area, Rev. 2  
FRS-II-434, Pre-Fire Plan U1 & U2 Charging Pump, Spray Additive Tank Area, Rev. 2  
FRS-II-453, Pre-Fire Plan U1 & U2 Auxiliary Building Ventilation Units, Rev. 2  
Salem Fire Protection Report Fire Hazards Analysis, NC.DE-PS.ZZ-0001-A2-FHA, Rev. 6  
SC.FP-AP.ZZ-0003, Actions For Inoperable Fire Protection - Salem Station, Rev. 11  
Salem and Hope Creek Fire Impairment Log Book

Notifications

20130128, 20221470, 20264976, 20264977, 20100796, 20141906, 20269584, 20167332,  
20271401

Orders

60042300, 60037449, 60040631, 60006791, 20269125

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

Procedures

Salem Event Classification Guide, Rev. 63  
S2.OP-AB.FIRE-0001, Control Room Fire Response, Rev. 2

S2.OP-AB.4KV-0002, Loss of 2B 4KV Vital Bus, Rev. 9  
SC.OP-AB.ZZ-0004, Earthquake, Rev. 0  
2-EOP-TRIP-0001, Reactor Trip or Safety Injection, Rev. 25  
2-EOP-TRIP-0002, Reactor Trip Response, Rev. 26  
2-EOP-FRHS-0001, Response to Loss of Secondary Heat Sink, Rev. 24

Notifications

20270478, 20271101, 20275595

Other Documents

Simulator Training Scenario SG-0544

**Section 1R12: Maintenance Effectiveness**

Procedures

S1.OP-ST.SJ-0020, Periodic Leakage Test RCS Pressure Isolation Valves Mode 4, Rev. 25  
ER-SH-2002, System Health Indicator Program (SHIP), Rev. 0  
NC.ER-DG.ZZ-0101, System Health and Performance Monitoring, Rev. 7  
NC.NA-AP.ZZ-0016, Monitoring the Effectiveness of Maintenance, Rev. 6  
NC.QA-AP.ZZ-0077, Self Assessment Process, Rev. 1  
NC.WM-AP.ZZ-0001, Work Management Process, Rev.12  
SC.ER-DG-ZZ-0002, System Function Level Maintenance Rule Scoping vs. Risk Reference, Rev. 2  
SH.ER-DG.ZZ-0002, Maintenance Rule (a)(1) Evaluations and Goal Monitoring, Rev. 1  
SH.SE-DG.ZZ-0004, Expert Panel, Rev. 1  
SH.SE-DG.ZZ-0010, Preventable and Repeat Preventable System Functional Failure Determination, Rev. 3  
SH.SE-DG.ZZ-0014, Maintenance Rule Scoping, Rev. 0

Drawings

205234

Notifications

20258699, 20258718, 20259934, 20259106, 20262780, 20270451, 20272722, 20273962,  
20276867, 20273583, 20242987, 20243040, 20273466, 20185920, 20185951, 20233884,  
20166036, 20141474, 20158794, 20271319, 20179681, 20166036, 20197071, 20197306,  
20171098, 20197916

Orders

50076280, 50076295, 70051524, 80086291, 70051642, 70052387, 70045157, 70047213,  
70049537, 70044979, 70046256, 70035761, 80027719, 70054781

Salem Expert Panel Meeting Minutes

SAEP 2003-06, May 28, 2003  
SAEP 2003-10, July 23, 2003  
SAEP 2004-02, February 11, 2004  
SAEP 2004-15, July 29, 2004

SAEP 2004-16, August 8, 2004  
SAEP 2004-17, August 17, 2004  
SAEP 2004-19, September 24, 2004  
SAEP 2004-20, October 4, 2004  
SAEP 2004-22, November 16, 2004  
SAEP 2004-24, December 8, 2004  
SAEP 2005-01, January 21, 2004  
SAEP 2005-02, February 4, 2005  
SAEP 2005-04, February 25, 2005  
SAEP 2005-06, March 11, 2005  
SAEP 2005-10, June, 13, 2005  
SAEP 2005-11, June 28, 2005  
SAEP 2005-19, December 16, 2005

System Health Reports

Unit 1 Radiation Monitoring - 4<sup>th</sup> quarter 2005  
Unit 2 Radiation Monitoring - 4<sup>th</sup> quarter 2005  
Unit 1 and Unit 2 Chemical Volume Control System - 3<sup>rd</sup> quarter 2005  
Unit 1 Service Water System - 4<sup>th</sup> quarter 2005  
Unit 2 Service Water System - 4<sup>th</sup> quarter 2005  
Salem 3 Gas Turbine - 4<sup>th</sup> quarter 2005  
Unit 1 Feed and Condensate System - 4<sup>th</sup> quarter 2005  
Unit 2 Feed and Condensate System - 4<sup>th</sup> quarter 2005  
Control Air System - 3<sup>rd</sup> quarter 2005  
Control Air System - 2<sup>nd</sup> quarter 2005

Other Documents

NRC Combined Inspection Report Nos. 50-272/96-20 and 50-311/96-20, dated Feb. 12, 1997  
NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Rev. 2  
Maintenance Rule Expert Panel meeting minutes for February 11, 2004, June 28, 2005, and August 9, 2005  
Safety Injection Plant Health Committee System Presentation Reports for 4<sup>th</sup> quarter 2005  
Safety Injection SHIP System Reports for 4<sup>th</sup> quarter 2005  
Salem Maintenance Rule Status and Projections, February 28, 2006  
Report #80079783, 2005 10 CFR 50.65 (a)(3) Maintenance Rule Periodic Assessment - Salem and Hope Creek Generating Stations, June 2005

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

Procedures

SH.OP-AP.ZZ-0027, On-Line Risk Assessment, Rev. 9  
NC.CC-DG.ZZ-0003, PRA Weekly Risk Assessment (a)(4) Desktop Guide, Rev. 4  
NC.CA-DG.ZZ-0102, Operational and Technical Decision Making Process Desk Guide, Rev. 1  
NC.WM-AP.ZZ-0001, Work Management Process, Rev. 12

Notifications

20269438, 20269386, 20269733, 20269574, 20274581, 20272759

Other Documents

Completed Salem Generating Station Weekly Risk Evaluation Forms  
Risk-Informed Inspection Notebook For Salem Generating Station, Rev. 2  
PRA Risk Evaluation Forms (published weekly on PSEG LAN website)  
Protected Equipment/Heightened Awareness Log

**Section 1R14: Operator Performance During Non-Routine Evolutions and Events**

Procedures

S1.OP-AB.115-0008, Loss of 14 MAC, Rev. 8  
S1.OP-SO.115-0018, 14 MAC Panel Operation, Rev. 0  
S1.OP-AB.CN-0001, Main Feedwater/Condensate System Abnormality, Rev. 13  
S1.OP-SO.TRB-0002, Turbine Generator Shutdown Operations, Rev. 5  
S1.OP-IO.ZZ-0003, Hot Standby to Minimum Load, Rev. 17  
S1.OP-IO.ZZ-0004, Power Operation, Rev. 42  
S1.OP-IO.ZZ-0005, Minimum Load to Hot Standby, Rev. 16  
S1.OP-IO.ZZ-0008, Maintaining Hot Standby, Rev. 9  
1-EOP-TRIP-1, Reactor Trip or Safety Injection, Rev. 24  
1-EOP-TRIP-2, Reactor Trip Response, Rev. 23

Notifications

20269511, 20274238, 20269439, 20269544, 20269482, 20270282, 20271137, 20271808

Orders

70053545

Other Documents

Salem Unit 2 Chill Water Expansion Tank Low Prompt Investigation  
Adverse Condition Monitoring and Contingency Plan 06-004, 14 MAC Panel Over-voltage  
Monitoring Plan, dated Feb. 10, 2006  
Issue Resolution Documentation Form S-06-03, dated Feb. 9, 2006

**Section 1R15: Operability Evaluations**

Procedures

SH.OP-AP.ZZ-0108, Operability Assessment and Equipment Control Program, Rev. 22  
S2.OP-SO.CVC-0002, Charging Pump Operation, Rev. 33  
S2.OP-ST.SJ-0016, High Head Cold Leg Throttling Valve Flow Balance Verification, Rev. 25  
S1.OP-PT.SW-0006, Service Water Fouling Monitoring Diesel Generators, Rev. 8  
S2.OP-SO.SWV-0001, Service Water Ventilation Operation, Rev. 0

Drawings

205342, 211806, 220948, 238079

Notifications

20271899, 20270268, 20245421, 20271959, 20271899, 20275231, 20271960, 20256277, 20258400, 20258788, 20262329, 20271004, 20268417, 20271659, 20272908, 20271675, 20273901

Orders

70053556, 50070829, 70054946, 70051926, 80088092, 30129801, 30118746, 60058323, 70051506, 70022968, 70053033, 80088029

Other Documents

Adverse Condition Monitoring and Contingency Plan 05-008, Charging Pump Check Valve Back Leakage, Revision 1, dated Feb. 13, 2006, and Revision 0, dated Aug. 3, 2006  
10 CFR 50.59 screening form, 20270268, Potential C/SI Pump Discharge Check Valve Back-leakage Determination, Rev. 0  
PSEG calculation S-C-SJ-MEE-1461, RWST Level Requirement for ECCS Flow Balancing, Rev. 0, dated Feb 15, 2001  
DE-CB.SW-0047, Configuration Baseline Documentation for Service Water System, Rev. 7  
Westinghouse NF-PSE-06-2, Input to Operability Determination/Functionality Assessment for Damaged annular Axial Blanket Pellets

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

Procedures

NC.MD-AP.ZZ-0050, Maintenance Testing Program Matrix, Rev. 5  
NC.NA-AP.ZZ-0050, Station Post Maintenance Testing, Rev. 7  
SH.MD-EU.ZZ-0014, Diagnostic Testing of Motor Operated Valves, Rev. 3  
S1.IC-SC.CBV-0168, Containment Fan Coil Units Leak Detection, Rev. 6  
S2.OP-ST.SW-0009, Inservice Testing Service Water Valves (Penetration Area) Modes 1-6, Rev. 8  
SC.MD-PM.ZZ-0210, Disassembly, Inspection, and Reassembly of BNL Ball Valve Mark # AA-299, AA-303, BA-154, and AA-319, Rev. 8  
SC.MD-PM.ZZ-0048, Disassembly, Inspection and Reassembly of Mark # A232 Check Valves, Rev. 2  
SC.MD-PM.CH-0002, Chiller Condenser Heat Exchanger Internal Inspection and Leak Check, Rev. 10  
S1.OP-ST.SW-0001, Inservice Testing - 11 Service Water Pump, Rev. 22

Drawings

211357

Notifications

20271235, 20274340, 20275435

Orders

30024903, 30059159, 60035202, 30079959, 30133952, 30101482, 40020162, 40022243, 30012676, 30079959, 30133952, 60041669, 50036534, 50036455, 50063609, 50083049, 30128164, 30129161, 60061042, 30082710, 30131431, 50092784, 30109701, 30116926,

60060921, 30082710

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

Procedures

SC.OP-DG.ZZ-0101, Salem Post-Trip Data Collection Guidelines, Rev. 8  
SH.OP-AP.ZZ-0101, Post Trip Response Requirements, Rev 12  
S1.OP-IO.ZZ-0003, Hot Standby to Minimum Load, Rev. 17  
S1.OP-IO.ZZ-0008, Maintaining Hot Standby, Rev. 9

Notifications

20274660, 20274733, 20274627, 20274659, 20274637, 20274654, 20274969

Orders

80088694

Other Documents

Salem Unit 1 Startup Equipment Monitoring Plan, dated March 9, 2006

**Section 1R22: Surveillance Testing**

Procedures

S2.OP-ST.CVC-0003, Inservice Testing - 21 Charging Pump, Rev. 19  
S2.RA-ST.CVC-0003, Inservice Testing 21 Charging Pump Acceptance Criteria, Rev. 11  
S2.OP-ST.CVC-0005, Inservice Testing - 23 Charging Pump, Rev. 16  
S2.RA-ST.CVC-0005, Inservice Testing 23 Charging Pump Acceptance Criteria, Rev. 10  
S2.OP-ST.RC-0008, Reactor Coolant System Water Inventory Balance, Rev. 26  
S2.OP-ST.AF-0001, Inservice Testing - 21 Auxiliary Feedwater Pump, Rev. 15  
S2.RA-ST.AF-0001, Inservice Testing 21 Auxiliary Feedwater Pump Acceptance Criteria,  
Rev. 5  
S2.IC-CC.AF-0218, 2FA-1095 #23 Steam Generator Auxiliary Feedwater Flow, Rev. 8  
S1.OP-ST.CS-0003, Inservice Testing - Containment Spray Valves, Rev. 4  
S1.RA-ST.CS-0003, Inservice Testing Containment Spray Valves Acceptance Criteria, Rev. 4  
S1.OP-ST.DG-0005, 12 Fuel Oil Transfer System Operability Test, Rev. 22  
S1.RA-ST.DG-0005, Diesel Generator Auxiliaries 12 Fuel Oil Transfer System Operability Test  
Acceptance Criteria, Rev. 8  
S1.OP-PT.CA-0001, Emergency Control Air Compressor Functional Test, Rev. 15

Notifications

20270268, 20272157, 20271493, 20269501, 20271956

Orders

50091614, 50092685, 30134561, 80088239, 50091498, 50079445, 50091591, 50091409,  
30134569, 30132936

**Section 1R23: Temporary Plant Modifications**

Procedures

NC.NA-AS.ZZ-0059, 10CFR50.59 Program Guidance, Rev. 11  
NC.DE-AP.ZZ-0030, Control of Temporary Modifications, Rev. 5

Notifications

20264477

Orders

80087816, 800088269, 80088333

Other Documents

Temporary modification packages 06-003, Rev. 0 and ST1-06-006, Rev. 0  
Vendor technical documents 106250 & 303260  
PSEG Calculation S2SC-179, Stress Analysis for 2CV57 Leak Repair T-mod 80087816

**Section 1EP6: Drill Evaluation**

Procedures

Salem Event Classification Guide, Rev. 63  
NC.EP-EP.ZZ-0102, Emergency Coordinator Response, Rev. 11  
NC.EP-EP.ZZ-0404, Protective Action Recommendations (PARS) Upgrades, Rev. 2  
NC.EP-EP.ZZ-0401, Emergency Preparedness Coordinator Response, Rev. 3

Notifications

20273424, 20272274, 20272465, 20272865

Other Documents

PSEG Nuclear Emergency Plan Practice Exercise drill guide

**Section 2OS1: Access Control to Radiologically Significant Areas**

Procedures

NC.RP-TI.ZZ-0203, High Radiation Area Key Control, Rev. 6  
NC.RP-TI.ZZ-0204, Posting of Radiological Signs and Barriers, Rev. 2

Notifications

20267250, 20267305, 20267674, 20267738

**Section 2OS2: ALARA Planning and Controls**

Procedures

NC.RP-TI.ZZ-0202, ALARA Planning Process, Rev. 6  
NC.RP-AP.ZZ-0007, ALARA Process, Rev. 1



Other Documents

Station ALARA Committee Charter

Station ALARA Committee Meeting Minutes, dated Mar. 10&15, 2005, Apr. 19, 2005, Sep. 28, 2005, & Oct. 14&21, 2005

**Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems**

Other Documents

Calibration/testing records for the following systems/components:

Radiation Monitoring Systems

Low range plant vent noble gas process radiation monitors (1R41A, 2R41A)

Plant vent intermediate range noble gas process radiation monitors (1R41B, 2R41B)

Plant vent high range noble gas process radiation monitors (1R41C, 2R41C)

Composite plant vent noble gas process radiation monitors (1R41D, 2R41D)

Plant vent noble gas background radiation monitors (1R45A, 2R45A)

Plant vent noble gas intermediate range process radiation monitors (1R45B, 2R45B)

Plant vent noble gas high range process radiation monitors (1R45C, 2R45C)

Plant vent particulate process radiation monitors (1R45D, 2R45D)

Steam generator blowdown process radiation monitors (1R19A-D; 2R19A-D)

Liquid waste disposal process radiation monitors (1R18, 2R18)

Fan coil unit process radiation monitors (1R13A-E, 2R13A-C)

Containment atmosphere noble gas process radiation monitors (1R12A, 2R12A)

Containment atmosphere radioiodine radiation monitor (2R12B)

Containment atmosphere particulate process radiation monitors (1R11A, 2R11A)

Flow Rate Measuring Devices

Waste liquid system flow rate monitors

Steam generator blowdown flow rate monitors

Plant vent noble gas sample and process flow rate monitors

Air Treatment Systems

Control room emergency filtration systems

Auxiliary building exhaust air filtration systems

Fuel handling area ventilation systems

2004 Annual Radioactive Effluent Release Report for the Salem and Hope Creek Generating Stations dated April 26, 2005

Offsite Dose Calculation Manual for Salem Generating Station, Rev. 17

Gaseous Radioactive Waste Release Permit 51418.272.006.G

Liquid Radioactive Waste Release Permit 50326.102.028.L

Analytics Cross Check Program for 1<sup>st</sup>, 2<sup>nd</sup>, & 4<sup>th</sup> Quarter 2005

Monthly Liquid Effluent Monthly Individual Dose Calculations for Jan. 2005 - Jan. 2006

Monthly Air Doses Due to Gaseous Releases Calculations for Jan. 2005 - Jan. 2006

Quality Assurance Assessment Reports 2005-0061 & 2005-0030

**Section 4OA1: Performance Indicator Verification**

Other Documents

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 3  
PSEG LAN Maintenance Rule Website

**Section 4OA2: Identification and Resolution of Problems**

Procedures

S1.OP-ST.CVC-0005, Inservice Testing - 13 Charging Pump, Rev. 16  
S2.OP-ST.CVC-0005, Inservice Testing - 23 Charging Pump, Rev. 17  
S1.OP-SO.CVC-0002, Charging Pump Operation, Rev. 31  
S2.OP-SO.CVC-0002, Charging Pump Operation, Rev. 33  
S1.OP-ST.SJ-0016, High Head Cold Leg Throttling Valve Balance Verification, Rev. 18  
S2.OP-ST.SJ-0016, High Head Cold Leg Throttling Valve Balance Verification, Rev. 25

Notifications

20254283, 20274499, 20182050, 20192278, 20193182, 20193098, 20196151, 20205295,  
20246326, 20257289, 20253579, 20270268, 20270528, 20270455, 20270454, 20245421

Orders

70051863, 70050657, 70053566, 60045767, 60046082, 70040263, 60046082, 70040263,  
70039913, 80082188, 70049107, 80084999, 30130348, 30130349

Other Documents

Safety Conscious Work Environment Metrics Quarterly Report, dated Jan. 31, 2006  
PSEG Guidance for Evaluation for 'No Adverse Trend' in SCWE-related Performance Metrics  
Exelon Nuclear Procedure EI-SH-100-1003, "Executive Protocol Group," Rev. 2  
NRC Inspection Reports 05000272/2004004 & 05000311/2004004, and 05000272/2004005 &  
05000311/2004005  
PSEG Technical Evaluation, Evaluation of 21/22 Charging Pump Check Valve Back Leakage  
Troubleshooting Results, dated Feb. 2, 2006

**Section 4OA3: Event Followup**

Procedures

S1.OP-ST.SJ-0020, Periodic Leakage Test RCS Pressure Isolation Valves Mode 4, Rev. 16  
S1.OP-IO.ZZ-0008, Maintaining Hot Standby, Rev. 9  
1-EOP-TRIP-1, Reactor Trip or Safety Injection, Rev. 24  
1-EOP-TRIP-2, Reactor Trip Response, Rev. 23  
SC.OP-DG.ZZ-0101, Salem Post-Trip Data Collection Guidelines, Rev. 8  
SH.OP-AP.ZZ-0101, Post Trip Response Requirements, Rev. 12

Notifications

20260710, 20274660, 20274637, 20274627, 20274654, 20274969

Orders

70051642, 80086429, 80088694, 70054731

Other Documents

Post-Trip Report for March 8, 2006 Salem Unit 1 trip

**LIST OF ACRONYMS**

ACE	Apparent Cause Evaluation
AFW	Auxiliary Feedwater
ALARA	As Low As Is Reasonably Achievable
CC	Component Cooling
CFCU	Containment Fan Coil Unit
CFR	Code of Federal Regulations
EMI	Electromagnetic
EP	Emergency Preparedness
EQ	Environmental Qualification
gpm	Gallons Per Minute
LER	Licensee Event Report
MR	Maintenance Rule
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OD	Operability Determination
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PI	Performance Indicator
PM	Preventive Maintenance
PSEG	Public Service Enterprise Group
RETS	Radiological Effluent Technical Specification
RFI	Radio-Frequency Interference
SCWE	Safety Conscious Work Environment
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SGFP	Steam Generator Feed Pump
SHIP	System Health Indicator Program
SW	Service Water
TS	Technical Specification
UFSAR	Final Safety Analysis Report
VHRA	Very High Radiation Areas
WO	Work Order