May 11, 2007

Mr. William Levis
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 05000272/2007002 and 05000311/2007002

Dear Mr. Levis:

On March 31, 2007, the US Nuclear Regulatory Commission (NRC) completed an inspection at the Salem Nuclear Generating Station. The enclosed integrated inspection report documents the inspection results, which were discussed on April 5, 2007, with Mr. Joyce 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.

The report documents one self-revealing finding of very low safety significance (Green). This finding was determined to involve violations 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 of the NRC Enforcement Policy. If you contest any 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 Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States 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/

Arthur L. Burritt, Chief
Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000272/2007002 and 05000311/2007002
w/Attachment: Supplemental Information

cc w/encl:
T. Joyce, Site Vice President - Salem
D. Winchester, Vice President Nuclear Assessments
B. Clark, Director - Finance
C. J. Fricker, Salem Plant Manager
J. J. Keenan, General Solicitor, PSEG
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L. A. Peterson, Chief of Police and Emergency Management Coordinator
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K. Tosch, Chief, Bureau of Nuclear Engineering, NJ Dept. of Environmental Protection
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Consumer Advocate, Office of Consumer Advocate, Commonwealth of Pennsylvania
N. Cohen, Coordinator - Unplug Salem Campaign
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 Nos.	05000272/2007002 and 05000311/2007002
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, 2007 through March 31, 2007
Inspectors:	D. Schroeder, Senior Resident Inspector H. Balian, Resident Inspector J. Schoppy, Jr., Senior Reactor Inspector S. McCarver, Project Engineer J. Furia, Senior Health Physicist M. Snell, Reactor Inspector D. Tifft, Reactor Inspector M. Patel, Reactor Inspector A. Patel, Reactor Inspector N. Perry, Senior Emergency Preparedness Inspector R. Cureton, Emergency Preparedness Inspector R. Nimitz, Senior Health Physicist
Approved By:	Arthur L. Burritt, Chief Projects Branch 3 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000272/2007002, 05000311/2007002; 01/01/2007 - 03/31/2007; Salem Nuclear Generating Station Units 1 and 2; Maintenance Effectiveness.

The report covered a 13-week period of inspection by resident inspectors, and an announced inspection by a regional radiation specialist, emergency preparedness inspector, and a regional project engineer . One Green non-cited violation (NCV) and one unresolved item were 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 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because PSEG did not conduct maintenance in accordance with appropriate written procedures. Specifically, the pump packing was not adequately cooled during the PMT, damaging the 15 SWP.

  The finding is more than minor because it impacted the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, incorrectly performed maintenance reduced the availability of the 15 SWP. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 screen and determined that this finding required a Phase 2 analysis because both the Initiating Event and Mitigating Systems Cornerstones were adversely impacted by the 15 SWP unavailability. Based upon the Risk-Informed Notebook for Salem Generating Station not containing a Loss of Service Water worksheet, the Senior Reactor Analyst (SRA) conducted a Phase 3 risk assessment and determined that the finding was of very low safety significance (Green).

  The performance deficiency has a cross-cutting aspect in the area of human performance because PSEG did not effectively communicate human error prevention techniques. Maintenance technicians assigned to perform the post-maintenance test were unfamiliar with the task. The pre-job brief did not discuss in detail the application of external cooling water to the packing gland during packing break in. At the job site, maintenance technicians proceeded with the post-maintenance test in the face of uncertainty, resulting in equipment damage. (Section 1R12)

B. Licensee Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 1 began the period at 100 percent (%) power. End of cycle coastdown commenced on March 9, 2007, with power reducing approximately 1% per day until the unit was shut down at 8:00 pm on March 27, 2007, to start the eighteenth refuel outage of Unit 1 (1R18). Mode 5 was reached at 5:00 am on March 28, 2007, and Mode 6 was achieved at 10:30 am on March 31, 2007. The refuel outage was in progress at the end of the inspection period.

Unit 2 began the period at 100% power. On February 10, 2007, power was reduced to 85% for turbine valve testing. Power was returned to 100% on February 11, 2007. On March 21, 2007, at 9:30 am, power was reduced to 95% in accordance with plant procedures in response to an unplanned partial loss of circulating water. Power was raised to 100% at 10:00 pm on March 21, 2007, where it remained until the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope (2 samples)

The inspectors reviewed PSEG's preparation and response to two site specific weather related conditions. First, the inspectors reviewed adverse weather preparation activities related to the potential for river grass intrusion conditions. Inspectors assessed implementation of PSEG's grassing readiness plan through plant walkdowns, corrective action program review, and discussions with cognizant managers and engineers. Documents reviewed by inspectors are listed in the attachment.

Second, the inspectors reviewed PSEG's response to abnormally cold weather the week of February 5, 2007. The inspectors reviewed Units 1 and 2 service water system performance and impact on supported systems. The review included Salem's response to a degraded ice barrier at the service water intake structure and to unusually low river water levels caused by high winds coincident with spring tides. The inspectors observed control room and equipment operator response to the adverse environmental condition, including additional monitoring of affected plant equipment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown (4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of four systems comprising four samples to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. 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 personnel 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 systems were walked down:

- Unit 2 boration flow paths and redundant charging pumps following the emergent failure of the No. 23 charging pump
- Unit 1 and Unit 2 containment spray systems during planned maintenance on the containment spray system
- Unit 1 and Unit 2 carbon dioxide (CO_2) fire suppression systems following design changes and restoration to service following a system outage
- Unit 1 service water (SW) header No. 12 during the No. 11 SW header outage

.2 Complete Walkdown (IP 71111.04S - 1 sample)

a. Inspection Scope

The inspectors conducted one complete walkdown of accessible portions of the Salem Unit 2 auxiliary feedwater system to verify that the system was properly configured, hangers and supports were correctly installed and functional, pump oil reservoir levels were normal, and to identify any discrepancies between the existing valve lineup and the prescribed lineup. The inspectors used PSEG procedures and other documents to verify proper system alignment and functional capability. The inspectors reviewed corrective action evaluations associated with the system to determine whether equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection - Tours (71111.05)

a. Inspection Scope (11 samples)

The inspectors conducted a tour of the eleven areas listed below 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.

- Unit 1 and Unit 2 Pre-Fire Plan FRS-II-511, Electrical Penetration Area Elevation: 78' - 0"
- Unit 1 and Unit 2 Pre-fire Plan FRS-11-512, Mechanical Piping Penetration Area Elevations: 78' & 100'
- Salem Pre-Fire Plan FRS-III-815, Fire/Fresh Water Pump House
- Salem Pre-Fire Plan FRS-III-821, Station Black-Out Compressor Building
- Unit 1 and Unit 2 Pre-Fire Plan FRS-II-444 Demineralized Ion Exchanger Area
- Unit 3 Pre-Fire Plan FRS-III-818, Combustion Turbine
- Unit 1 and Unit 2 Pre-Fire Plan FRS-II-912, Service Water Pipe Trench & Tunnel

b. Findings

No findings of significance were identified.

.2 Fire Protection - Drill Observation (71111.05A)

a. Inspection Scope (1 sample)

The inspectors observed one fire drill conducted in the Salem Unit 1 turbine building at elevation eighty eight feet. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. The inspectors verified that PSEG staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

.1 Operating Experience Smart Sample (OpESS) FY2007-02 Review

a. Inspection Scope (1 sample)

Internal Flooding Review. NRC Operating Experience Smart Sample (OpESS) FY2007-02 is related to NRC Information Notice 2005-30 and issues associated with conduit/hydrostatic seal issues. The inspectors evaluated internal flood protection measures for the 4KV vital switchgear rooms, fuel oil transfer pump rooms, and residual heat removal (RHR) pump rooms for both Salem Units. The inspectors walked down the areas to assess operational readiness of various features in place to protect redundant safety-related components and vital electric power systems from internal flooding. These features included plant drains, flood barrier curbs, and wall penetration seals. The inspectors conducted a detailed walkdown of the turbine and auxiliary buildings with a design engineer to assess potential internal flood vulnerabilities. The inspectors also reviewed the results of flood barrier penetration seal inspections, flooding evaluations, preventive maintenance history, and corrective action notifications associated with flood protection measures. Finally, the inspectors interviewed main control room operators regarding their knowledge of indications, procedures and required actions during a postulated turbine building piping rupture. Documents reviewed are listed in the attachment.

b. Findings

The inspectors identified several potential vulnerabilities to internal flooding, applicable to both Salem units, that called into question PSEG's design control as described in the Salem Updated Final Safety Analysis Report (UFSAR). In particular, the inspectors identified the following concerns:

(1) UFSAR Section 3.6.4.3.2 states that "Design basis cracks were also postulated to occur in high energy lines at the most adverse locations with respect to safeguards equipment and structures. For Unit 1 design basis cracks only were postulated for those systems whose pressure is more than 275 psig or whose temperature is more than 200°F."

The inspectors found no apparent high energy line break (HELB) barriers and/or engineering evaluation for the high energy piping (i.e. heating steam & heating water systems) in the auxiliary building 84' corridor adjacent to the Unit 1 & 2 460V vital switchgear rooms. The 460V switchgear rooms contain redundant safe shutdown equipment (A, B, & C 230V vital buses; A, B, & C 460V vital buses; and A, B, & C 125V distribution cabinets). The 84' corridor is also directly above the 4160V vital switchgear rooms (64' elevation). The 4160V switchgear rooms contain redundant safe shutdown equipment (A, B, & C 4160V vital buses) and the C 125VDC batteries. The equipment drains in the 84' corridor also represent a potential steam flooding concern to the 460V switchgear rooms, 4160V switchgear rooms, and RHR pump rooms (dependent on actual drain pipe routing) due to the lack of installed equipment drain check valves in these rooms. In addition, the inspectors questioned whether portions of the above mentioned high energy piping met the design criteria for encapsulation sleeves as described in UFSAR Section 3.6.5.11 (a Unit 2 design basis pipe break concern only).

(2) UFSAR Section 3.6.5.13 states, in part, “Investigations have been made as to the capability of operation of Class I (seismic) equipment in the event of a failure of non-Class I (seismic) equipment which would cause flooding due to tank rupture. The monitor tanks are not diked, but the failure of any of these tanks would not cause flooding serious enough to prevent Class I (seismic) safety-related equipment from operating satisfactorily. A similar investigation showed that equipment arrangement and floor drainage systems design are adequate to prevent flooding in the event of a non-Class I (seismic) pipe rupture serious enough to prevent safeguards systems from operating satisfactorily.” The inspectors noted that there appears to be several non-seismic piping systems in the auxiliary building 84' corridor adjacent to the Unit 1 & 2 460V vital switchgear rooms. The inspectors found no engineering evaluation (flooding analysis) to ensure that the rupture of these non-seismic piping systems during a seismic event would not prevent Class I (seismic) safety-related equipment from operating satisfactorily. Specifically, these non-seismic piping systems represent a significant internal flood vulnerability to the vital switchgear rooms (460V & 4160V) and RHR pump rooms given the existing minimal flooding barriers, no apparent flood detection, and interconnected equipment drain system.

(3) The inspectors noted that there are no equipment drain check valves installed in the 64' 4160V vital switchgear rooms. The inspectors found no engineering evaluation (flooding analysis) to ensure that the rupture of non-seismic tanks and/or piping systems (located at and above 64' elevation in the auxiliary building) during a seismic event would not prevent Class I (seismic) safety-related equipment in the 4160V vital switchgear rooms from operating satisfactorily.

(4) The inspectors noted that there are no equipment drain check valves installed in the RHR pump rooms and that the drain system appears to be interconnected (drain water above the 45' elevation can flow to both RHR pump room sumps). The inspectors found no engineering evaluation (flooding analysis) to ensure that the rupture of non-seismic tanks and/or piping systems (located at and above 45' elevation in the auxiliary building) during a seismic event would not result in flooding out both RHR pump rooms concurrently. For example, a rupture of the monitor tanks on 64' elevation may result in concurrently flooding both RHR pump rooms.

(5) The inspectors noted that there are no equipment drains, no flood detection, and no watertight doors in the 84' area containing the two redundant safety-related diesel fuel oil transfer pumps (FOTPs). The inspectors found no engineering evaluation (flooding analysis) to ensure that the rupture of non-seismic tanks and/or piping systems (located in, adjacent to, or above this area) following a seismic-induced loss of offsite power event would not prevent Class I (seismic) safety-related equipment from operating satisfactorily. Specifically, flood damage to both FOTPs (given that the FOTP motors are located only inches off the 84'elevation floor) and subsequent failure of all three redundant emergency diesel generators (following consumption of the limited fuel oil supply in their respective day tanks).

The inspectors discussed the above concerns with PSEG engineering on several occasions during the inspection period. On February 8, 2007, engineering initiated corrective action notification (NOTF) 20312851 to evaluate the NRC inspectors’ flooding

questions and concerns. PSEG's evaluation of NOTF 20312851 was still in progress at the end of the inspection period.

The inspectors determined that Salem's potential vulnerabilities to internal flooding will be treated as an unresolved item (URI), pending completion of a technical evaluation by PSEG. An unresolved item is an issue requiring further information to determine if it is acceptable, if it is a finding, or if it constitutes a deviation or violation of NRC requirements. In this case, additional NRC review will be required to independently assess PSEG's technical evaluation of the above concerns relative to PSEG's design and licensing bases. Specifically, the NRC will assess whether PSEG adequately implemented design control measures to ensure the capability of operation of Class I (seismic) equipment in the event of a failure of non-Class I equipment in the auxiliary building. **(URI 05000272&311/2007002-01, Potential Vulnerabilities to Internal Flooding)**

1R11 Licensed Operator Requalification Program (71111.11Q)

a. Inspection Scope (1 sample)

The inspectors observed a simulator training scenario conducted on February 20, 2007, to assess operator performance and training effectiveness. The scenario involved a loss of generator stator cooling and a component cooling (CC) water leak in containment that required operators to manually trip the simulated plant. 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)

a. Inspection Scope (2 samples)

The inspectors reviewed performance monitoring and maintenance effectiveness issues for components and systems. 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 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, and preventive maintenance tasks. Documents reviewed are listed in the attachment. The following two samples were completed:

- Unit 1 15 service water pump
- Unit 2 turbine driven auxiliary feedwater (TDAFW) pump

b. Findings

Green. A self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified for failure to conduct maintenance in accordance with appropriate written procedures.

Description: Between November 27 and December 2, 2006, PSEG personnel replaced the 15 service water pump (SWP) shaft sleeve and pump packing under work order 30002817. On December 2, the 15 SWP was started to break-in and adjust the new packing. While the 15 SWP was running the shaft sleeve and packing overheated, damaging the 15 SWP. The 15 SWP was repaired and returned to service on December 7, 2006.

PSEG entered this issue into the corrective action program as NOTF 20306266, completed corrective maintenance under the original work order, and evaluated the issue under work order 70064075. PSEG determined that the damage was caused by inadequate cooling of the packing. The packing did not receive sufficient cooling because the leak-off line was clogged with accumulated sediment from the Delaware River and because external cooling was not applied during initial break-in. The leak-off line provides cooling to the packing by allowing a small amount of service water to flow past the installed carbon bushing and up to the packing. In the process of performing the post maintenance test, the stuffing box overheated and the shaft sleeve seized to the stuffing box bearing, in turn causing the bearing to spin in the stuffing box bearing seat. Examination of the packing, shaft sleeve, and the stuffing box revealed that the shaft sleeve was marked and discolored from the packing overheating the shaft sleeve and the carbon bushing in the bottom of the stuffing box appeared to have melted.

The post-maintenance test procedure for the pump is Section 5.7 of SC.MD-EU.SW-0002, Johnston Service Water Pump Removal and Installation. Stuffing box temperature measurements are recorded per procedure, and the pump must be stopped if stuffing box temperatures reach 180°F. PSEG determined that there was inadequate external cooling applied to the pump stuffing box during pump packing break in. The procedure notes that inadequate leakage and lubrication will burn packing and damage shafts and sleeves. It also notes that leakage should be free flowing, and that external cooling water should be available when adjusting packing. PSEG determined that this procedural guidance was vague, and led to the significant damage to the pump shaft sleeve and stuffing box. According to control room logs, the 15 Service Water Pump was run for fourteen minutes prior to being stopped for packing concerns. Based on the damage observed when the pump was inspected, actual stuffing box temperature exceeded 180°F before the pump was stopped. The pump was returned to the maintenance shop for rework, and five additional days of unavailability were accrued due to pump damage resulting from the improper post maintenance test.

Analysis: The inspectors determined that overheating of the 15 SWP shaft sleeve and packing following maintenance was a performance deficiency that caused 129 hours of

unavailability following the attempt to break-in the 15 SWP packing on December 2, 2006. The finding is more than minor because it impacted the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, incorrectly performed maintenance reduced the availability of the 15 SWP. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted a Phase 1 screen and determined that this finding required a Phase 2 analysis because both the Initiating Event and Mitigating Systems Cornerstones were adversely impacted by the 15 SWP unavailability. Because the Risk-Informed Notebook for Salem Generating Station does not contain a Loss of Service Water worksheet, the Senior Reactor Analyst (SRA) performed a Phase 3 risk assessment using the Salem Standardized Plant Analysis Risk (SPAR) model.

Consistent with the inspector's estimate of 129 hours of additional 15 SWP unavailability, the SRA used an exposure time of 129 hours to model this additional unavailability time interval and set the 15 SWP Test and Maintenance basic event (SWS-MDP-TM-1SWE5) to TRUE. The estimated increase in annualized core damage frequency for this condition was low E-9, or very low risk significance (Green). The dominant core damage sequences involved the loss of service water initiating events with subsequent operator failure to maintain adequate reactor coolant pump (RCP) seal cooling and resultant RCP seal failure.

The performance deficiency has a cross-cutting aspect in the area of human performance because PSEG did not effectively communicate human error prevention techniques. Maintenance technicians assigned to perform the post maintenance test were unfamiliar with the task. The pre-job brief did not discuss in detail the application of external cooling water to the packing gland during packing break in. At the job site, maintenance technicians proceeded with the post maintenance test in the face of uncertainty, resulting in equipment damage.

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be accomplished in accordance with documented instructions, procedures, or drawings, of a type appropriate to the circumstances. Section 5.7 of the Johnston Service Water Pump Removal and Installation procedure specifies actions to prevent heat damage to the pump during the packing run in. Contrary to the above, damage to the pump shows that the 15 service water pump was running with inadequate cooling flow to the packing and bushing, allowing gland temperature to exceed the 180°F limit specified in the procedure for pump shutdown. As a result, the 15 SWP was rendered inoperable for 129 hours, starting on December 2, 2006. Because this finding is of very low safety significance, and has been entered into the corrective action program in NOTF 20306266, this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000272/2007002-02, 15 Service Water Pump Unavailability)**

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

a. Inspection Scope (7 samples)

The inspectors reviewed seven 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 gain insights into the risk associated with these plant configurations. Finally, the inspectors reviewed notifications documenting problems associated with risk assessments and emergent work evaluations. Documents reviewed are listed in the attachment. The following plant configurations were assessed:

- Planned maintenance on the 22 containment fan coil unit (CFCU), the 24 service water (SW) pump, the number 1 station air compressor (SAC), and the 22 chiller concurrently
- Planned maintenance on the number 1 emergency control air compressor (ECAC), the number 1 SAC and the number 11 station power transformer (SPT)
- Emergent failure of the number 22 chiller concurrent with planned maintenance on the number 23 service water (SW) pump and number 1 SAC
- Unplanned maintenance on the number 2 250-VDC battery charger concurrent with planned maintenance on the 23 auxiliary building ventilation exhaust fan, the 26 service water pump, and the number 1 SAC. Automatic operation of pressurizer pilot operated relief valve (PORV) 2PR2 was unavailable at the time
- Planned maintenance on the 12 and 22 switchgear ventilation supply fan concurrent with planned maintenance on the 1 SAC, extreme cold winter weather conditions, and painting in the Unit 1 chiller room. Automatic operation of pressurizer PORV 2PR2 was unavailable at the time
- Planned maintenance on the station blackout (SBO) air compressor (a yellow risk condition for both units)
- Unplanned 12SW23 service water valve inoperability. 12SW23 was manually opened following the failure to close automatically.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (7 samples)

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

- NOTFs 20308265 and 20308301, operability of the Salem unit 1 and 2 auxiliary building ventilation (ABV) system with the ABV supply fan inlet guide vanes disabled during installation of an ABV permanent modification
- NOTF 20310615, operability of the Salem unit 1 and unit 2 service water systems during a period of abnormally low tide on January 19, 2007
- NOTF 20310248, operability of the 13 containment fan coil unit (CFCU) following a failure to start in slow speed during weekly high flow flush of the service water cooling coils
- NOTFs 20312989 and 20313029, operability of Salem unit 2 containment following isolation of component cooling (CC) water to the excess letdown heat exchanger in response to failed open CC relief valve 2CC112 and loss of indication for CC containment isolation valve 2CC215
- NOTF 20312512, operability of the unit 2 turbine driven auxiliary feedwater pump (23 AFW pump) following discovery that the turbine casing insulation was not installed
- NOTF 20314620, operability of the 22 service water pump and strainer following an overload trip of the strainer on February 24, 2007
- NOTF 20314524, 22 service water (SW) strainer motor thermal overload trip

The inspectors reviewed the technical adequacy of the operability determinations to verify the conclusions were justified. The inspectors also walked down accessible equipment to corroborate the adequacy of PSEG's operability determinations. Additionally, the inspectors reviewed other PSEG identified safety-related equipment deficiencies during this report period and assessed the adequacy of their operability screens. Notifications and documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope (1 sample)

The inspectors reviewed permanent modifications to the Salem Unit 1 and Unit 2 auxiliary building ventilation (ABV) supply fan control circuit under change numbers 80088621 and 80088622. This review included system walkdowns, interviews with plant engineers and operators, verification of simulator fidelity, and functional comparison of the new control scheme to the FSAR description. The inspectors also reviewed post modification testing.

This modification replaced an operator work around by making it possible to prevent automatic start of both ABV supply fans on receipt of an engineered safeguards (SEC) signal. The ABV system is expected to operate in a manner that maintains a slight vacuum in the auxiliary building following an accident. This ensures that any leakage is contained in the auxiliary building. Salem postulated an accident condition under which the auxiliary building would become pressurized and allow leakage to escape the auxiliary building. In response, Salem disabled automatic start of a single ABV supply

fan by deenergizing control power and taking other administrative actions. However, the operator actions needed to restore the disabled ABV supply fan to service were a significant operator work around. Therefore, Salem modified the ABV supply fan control circuitry to permit operators to control ABV supply fan configuration remotely from the control room requiring only minimal operator action.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (7 samples)

The inspectors observed portions of and/or reviewed results of seven post-maintenance test activities for the following equipment:

- Work order (WO) 60059304 and 60036717, repair of body-to-bonnet leakage from spent fuel pump discharge valves 11SF68 and 12SF68
- WO 30100378, 1 emergency control air compressor (ECAC) cleaning and calibration of alarm and trip switches
- WO 30100170, 22 chiller condenser heat exchanger internal inspection and leak repair
- WO 60029010, upgrade of Unit 2 main condenser air ejector radiation monitor 2R15 per DCP 80045601
- WO 60029010, upgrade Unit 2 condenser air ejector radiation monitor 2R15
- WO 60067562, replacement of 2CV141, 23 positive displacement charging pump discharge relief valve
- WO 60067650, retest of containment fan cooler unit service water valves

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.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (7 samples)

The inspectors observed portions of and/or reviewed results for seven 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 Updated Final Safety Analysis Report (UFSAR), and ASME Section XI for pump and valve testing. Documents reviewed are listed in the attachment. The following surveillance tests were inspected:

- Work order (WO) 50100886, Unit 1 SSPS Train A - reactor trip breaker UV coil and auto shunt trip
- WO 50100948, 23 component cooling pump inservice testing
- WO 50099941, 12 residual heat removal pump inservice testing
- WO 50102373, Unit 1 control rod exercising to verify control rod operability
- WO 50100783, 22 residual heat removal pump discharge check valve closure
- WO 50090169, 1B diesel generator endurance run
- S1.OP-ST.RC-0008, reactor coolant system water inventory balance

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness [EP]

1EP2 Alert and Notification System (ANS) Testing (71114.02)

a. Inspection Scope (1 sample)

An onsite review was conducted to assess the maintenance and testing of PSEG's ANS. During this inspection, the inspectors interviewed site EP staff responsible for implementation of the ANS testing and maintenance. Notifications (NOTFs) pertaining to the ANS were reviewed for causes, trends, and corrective actions. The inspectors further discussed with PSEG the new ANS system design and its benefits over the previous system. The inspectors reviewed PSEG's original ANS design report to ensure compliance with those commitments for system maintenance and testing. The inspectors toured both the Emergency Operations Facility (EOF) and the 911 center. On March 28, 2007, the inspectors observed a silent test of the ANS. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 2. Planning standard, 10 CFR 50.47(b)(5) and the related requirements of 10 CFR 50, Appendix E were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation (71114.03)

a. Inspection Scope (1 sample)

A review of Salem/Hope Creek's ERO augmentation staffing requirements and the process for notifying the ERO was conducted. This was performed to ensure the readiness of key staff for responding to an event and to ensure timely facility activation.

The inspectors reviewed procedures, issue reports , and call-in drills associated with the ERO notification system and drills. The inspectors interviewed personnel responsible for testing the ERO augmentation process. The inspectors compared qualification requirements to the training records for a sample of ERO members. The inspectors also verified that the EP department staff were receiving required training as specified in the emergency plan. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 3. Planning standard, 10 CFR 50.47(b)(2) and related requirements of 10 CFR 50, Appendix E were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04)

a. Inspection Scope (1 sample)

Prior to this inspection, the NRC had received and acknowledged changes made to the Salem/Hope Creek Emergency Plan and implementing procedures. PSEG developed these changes in accordance with 10 CFR 50.54(q), and determined that the changes did not result in a decrease in effectiveness to the Plan. PSEG also determined that the Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. During this inspection, the inspectors conducted a sampling review of Salem/Hope Creek's 10 CFR 50.54(q) screenings for the changes made to the Plan that could potentially result in a decrease in effectiveness. This review did not constitute NRC approval of the changes and, as such, the changes remain subject to future NRC inspection. Also, the NRC reviewed the licensee's EAL scheme for logic and consistency. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)

a. Inspection Scope (1 sample)

The inspectors reviewed self-assessments and audit reports to assess PSEG's ability to evaluate their performance and programs. The inspectors reviewed NOTFs initiated from December 2005 to March 2007 at Salem/Hope Creek from drills, self-assessments, and audits. This inspection was conducted according to NRC Inspection Procedure 71114, Attachment 5. Planning standard, 10 CFR 50.47(b)(14) and the related requirements of 10 CFR 50, Appendix E were used as reference criteria.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope (1 sample)

The inspectors observed the annual state emergency preparedness exercise, conducted on March 20, 2007. The inspectors evaluated drill performance relative to developing proper classifications, notifications, and protective action recommendations by PSEG personnel. The inspectors reviewed the Salem Event Classification Guides and Emergency Plans to determine that classifications and notifications were in accordance with these documents. Drill performance was observed in the control room simulator and the EOF. The drill critique adequately captured deficiencies with drill performance. The inspectors also verified that PSEG correctly counted the drill contribution in the NRC performance indicator for Drill/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 reviewed all PSEG performance indicators (PI) for the Occupational Exposure Cornerstone for followup. PSEG has had no PI events in this cornerstone in the past 4 quarters.

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 (e.g. surveys, postings, barricades) were acceptable.

The inspectors walked down these areas or their perimeters to determine that: prescribed radiation work permits, procedure, and engineering controls were in place, PSEG surveys and postings were complete and accurate, and air samplers were properly located.

The inspectors examined PSEG's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools.

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 do 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 require 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 (CEDE).

During the week of February 5, 2007, the inspectors made direct observations of radiologically significant work taking place in the primary auxiliary building. Activities observed included changing out of a reactor coolant filter and maintenance work on the 22 RHR system.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope (4 samples)

Utilizing PSEG records, the inspectors reviewed the historical trends and current status of tracked plant source terms. The inspectors determined that PSEG was making allowances or developing contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry. The inspectors focused on the upcoming Unit 1 refueling outage planning, including the basis for outage estimates, ALARA reviews, and revisions to radiation protection technician job guides.

The inspectors determined that there have been declared pregnant workers during the current assessment period. The inspectors reviewed the exposure results and monitoring controls employed by PSEG with respect to requirements of 10 CFR 20. A total of six personnel were declared pregnant workers during 2006, with the maximum dose during the declaration period being 3 millirem.

The inspectors reviewed PSEG's exposure tracking system. The inspectors determined that the level of exposure tracking detail, exposure report timeliness and exposure report distribution was sufficient to support control of collective exposures.

The inspectors determined that work activity planning includes consideration of the benefits of dose rate reduction activities such as shielding provided by water filled components/piping, job scheduling, and shielding and scaffolding installation and removal activities.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope (1 sample)

The inspectors reviewed corrective action program for NOTFs related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area. No NOTFs of this type were identified.

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) audit and dosimeter performance for the vendor laboratory utilized by PSEG to determine dose of record. The inspectors also reviewed the system calibration and periodic system checks for the licensee's whole body counter.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator (PI) Verification (71151)

a. Inspection Scope

Cornerstone: Mitigating Systems (2 samples)

- Safety System Functional Failures (Unit 1 and 2)

The inspectors reviewed all Salem Unit 1 and 2 licensee event reports issued from the four calendar quarters of 2006 for safety system functional failures as defined by NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4.

Cornerstone: Barrier Integrity (4 samples)

The inspectors sampled PSEG submittals for two PIs listed below for Salem Unit 1 and 2. For both PIs, the inspectors reviewed the period from the four calendar quarters of 2006. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4, were used to verify the basis in reporting for each data element.

- Reactor Coolant System (RCS) Identified Leak Rate
- RCS Specific Activity

The inspectors reviewed main control room logs and were familiar with identified leak rate data through plant status reviews required by NRC Inspection Manual Chapter 2515, Appendix D, "Plant Status."

Cornerstone: Emergency Preparedness (3 samples)

- Drill and Exercise Performance
- ERO Drill Participation
- Alert and Notification System Reliability

The inspectors reviewed supporting documentation from drills and tests in all quarters of 2006 to verify the accuracy of the reported data. The review of these PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria used for the review were 10 CFR 50.9 and NEI 99-02, Revision 4, "Regulatory Assessment Performance Indicator Guidelines."

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 follow-up, the inspectors performed a daily screening of all items entered into PSEG's corrective action program. This was accomplished by reviewing the description of each new notification and attending daily management review committee meetings. Documents reviewed are listed in the attachment.

4OA5 Other Activities

.1 (Closed) Unresolved Item (URI) 05000272/2003006-02

a. Inspection Background and Scope (71153)

Background

NRC Special Inspection Report No. 05000272/2003006; and 05000311/2003006, dated October 15, 2003, (ADAMS Accession No. ML032890212) described, in Section 4OA3.4, a condition involving through-wall leakage from the Unit 1 spent fuel pool (SFP) that resulted in onsite groundwater contamination. The circumstances surrounding the leakage, and the onsite ground water contamination, were further described in NRC Information Notice No. 2004-05: "Spent Fuel Pool Leakage to Onsite Groundwater," dated March 3, 2004 (ADAMS Accession No. ML040580454). During the inspection of this matter, an unresolved item (URI 05000272/2003006-02) was identified relative to evaluation of the potential effect of through-wall leakage on the reinforced concrete SFP structure.

In response to the through-wall leakage, PSEG conducted a prompt review that indicated there was no immediate safety concern associated with the structural integrity of the SFP structure. Notwithstanding, PSEG initiated both a short-term and long-term

investigation to throughly evaluate any potential negative impact of the leakage on the fuel pool structure and its design margins. PSEG obtained contractor technical support for this effort. Subsequently, PSEG's contractor conducted extensive testing of representative samples of concrete and steel rebar to evaluate potential impact of boric acid water leakage on the structure. The testing included submersion testing of concrete samples and the incorporated steel rebar, and evaluation of potential loss of structural design margins.

In February 2006, NRC staff met onsite with PSEG and contractor staff, toured the structure, and examined PSEG's assessment of the integrity of the SFP structure. The NRC concluded this matter did not represent an immediate or near-term safety concern. However, the NRC identified additional information that was needed for NRC to resolve the long-term aspects of this matter, establish a conclusion on the long-term structural integrity of the spent fuel pool, and close the unresolved item. NRC subsequently posed questions to PSEG to obtain additional information to support NRC evaluation and closure of the URI. The questions posed, and PSEG's responses are available at ADAMS Accession No. ML071080125. This Accession Number also includes PSEG's summary of its bases for concluding the SFP structure will remain sound and discusses concrete test results.

Inspection Scope

The NRC inspectors conducted an onsite inspection on February 28 and March 1, 2007 to review PSEG's responses to the questions provided. The NRC inspectors conducted independent visual observations of the Unit 1 and Unit 2 SFP structure; reviewed test data and test results, and reviewed SFP structure design margin evaluations. In addition, the NRC inspectors reviewed PSEG's plans for ongoing monitoring of the structure relative to applicable industry standards; and evaluated collection and management of leakage. Further, on March 21, 2007, an NRC inspector observed PSEG's set-up and in-situ testing of the compressive strength of portions of the Unit 1 spent fuel storage pool wall. The NRC inspectors also reviewed the results of the testing.

PSEG tested and evaluated the effects of boric acid on the SFP structures. The testing and evaluation was conducted in a phased approach. Short-term testing of potential boric acid degradation of concrete was initially conducted to identify potential near term degradation. These tests and evaluations were followed by longer term testing to evaluate potential long-term structural degradation. The testing included laboratory testing of boric acid solution degradation on concrete and steel rebar by use of representative boric acid solutions. PSEG also conducted SFP structural evaluations, per applicable industry standards (ACI 340.3R-02), and initiated long-term, ongoing monitoring of the spent fuel pool structures in accordance with this industry standard. PSEG's evaluations did not identify any indications of surface deterioration due to reinforcing steel corrosion and did not identify significant loss of design margin over the life of the facility. PSEG's test results indicated the structure would meet its design margins over the life of the facility including the expected time duration if the facility's operating licenses were renewed. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On April 5, 2007, the resident inspectors presented the inspection results to Messrs. Joyce and Fricker. None of the information reviewed by the inspectors was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

T. Joyce, Station Vice President
C. Fricker, Plant Manager
R. Gary, Radiation Protection Manager
D. Denelsbeck, Radiation Protection Supervisor
A. Johns, Radiation Protection Supervisor
T. Neufang, Radiological Engineering Manager
D. Burgin, Empergency Preparedness Manager
E. Villar, Regulatory Assurance Engineer
T. Mulholland, Spent Fuel Cooling System Manager
A. Johnson, Salem Mechanical/Structural Design Manager
L. Rajhonshi, Senior Manager Design Engineering
T. Roberts, Manager, Engineering Programs
J. Russell, Site Dosimetry
M. Gwirtz, Operations Director
H. Berrick, Licensing Engineer
J. Duffy, Design Engineer
J. Stone, Maintenance Director

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000272&311/2007002-01	URI	Potential vulnerabilities to internal flooding (Section 1R06)

Opened/Closed

05000272/2007002-02	NCV	15 service water pump unavailability (Section 1R12)

Closed

05000272/2003006-02	URI	NRC to review results of Unit 1 spent fuel pool structural analysis (Section 4OA5.1)

Discussed

None

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 1R01: Adverse Weather Protection

Procedures
WC-AA-107, Seasonal Readiness, Rev. 2
SC.OP-AB.ZZ-0001, Adverse Environmental Conditions, Rev. 9

Drawings
208997, 211612

Notifications
20311039, 20311315, 20311896, 20312388, 20311050, 20105467, 20114366, 20310774, 20312408, 20313500, 20313690, 20313265, 20312507, 20315710, 20315710

Orders
60030865, 80052059, 80091607

Other Documents
2007 Salem Grassing Seasonal Readiness Affirmation
Salem Generating Station Event Classification Guide

Section 1R04: Equipment Alignment

Procedures
S2.OP-SO.CVC-0001, Charging, Letdown, and Seal Injection, Rev. 29
S2.OP-SO.CVC-0002, Charging Pump Operation, Rev. 34
S2.OP-SO.CVC-0006, Boron Concentration Control, Rev. 20
S1.FP-PM.FS-0019, Non Class I CO_2 System Flow Path Verification, Rev. 0
S1.OP-AB.SW-0001, Loss of Service Water Header Pressure, Rev. 15
S1.OP-SO.SW-0005, Service Water System Operation, Rev. 35
S1.OP-ST.SW-0013, Service Water Valve Verification Modes 1-4, Rev. 1
S2.OP-SO.AF-0001(Q), Auxiliary Feedwater System operation, Rev. 27
S2.OP-ST.AF-0008(Q), Auxiliary Feedwater Valve Verification Modes 1-3, Rev. 4
S2.OP-ST.AF-0009(Q), Plant systems - Auxiliary Feedwater, Rev. 22
S2.OP-ST.AF-0011(Q), Auxiliary Feedwater Alternate Suction Source Verification Moses 1-3, Rev. 2
S2.OP-ST.AF-0012(Q), Auxiliary Feedwater Spool Piece Verification, Rev. 1

Drawings
205235, 205242, 205335, 205336, 207533, 229953, 239097, 205336, 600256, 600257, 600891

Completed Surveillances
S1.OP-ST.SW-0013, Service Water Valve Verification Modes 1-4, Rev. 1, dated 1/27/04

Notifications
20230859, 20308442, 20289724, 20287566, 20272406, 20265966, 20261079, 20243927, 20246647, 20256857, 20305194, 20304857, 20304397, 20299531, 20299044, 20302899, 20256957, 20310939, 20311083, 20311117, 20311183, 20311335, 20311382, 20311427, 20311430, 20311477, 20311563, 20311740, 20311748, 20309766, 20309770, 20309824, 20309825, 20267659, 20267664, 20276514, 20316073, 20316110, 20316124, 20314496

Orders
80089441, 80089591, 60068282, 70055420, 70046101

Other Documents
WCD 4193005
PSEG Nuclear LLC letter LR-N06-2006, dated April 13, 2006, to the NRC
DE-CB.SW-0047, Configuration Baseline Documentation for Service Water System, Rev. 6
Risk-Informed Inspection Notebook for Salem Generating Station, Rev. 2
Salem Inservice Testing Program Basis - Service Water Valves, Rev. 8
SGS Unit 1 PRA Risk Evaluation Form for Work Week No. 011, Rev. 1 (3/11/07 - 3/17/07)
Technical Specification 3.7.4.1, Service Water System
Updated Final Safety Analysis Report, Section 9.2.1, Service Water System
Lineup ID 942
Lineup ID 918

Section 1R05: Fire Protection

Procedures
Pre-Fire Plan FRS-II-511, U1 & U2 Electrical Penetration Area, Elevation: 78' - 0"
Pre-Fire Plan FRS-II-512, Rev 2, U1 & U2 Mechanical Piping Penetration Area, Elevations 78' & 100'
Pre-Fire Plan FRS-III-815, Salem Fire/Fresh Water Pump House
Pre-Fire Plan FRS-III-821, Salem Station Black-Out Air compressor Building
Salem - Unit 1, (Unit 2) Pre-Fire Plan FRS-II-444, Demineralized Ion Exchanger Area, Rev. 3
Salem Pre-Fire Plan FRS-III-818, Unit 3 Jet - Combustion Turbine, Rev. 3
SC.OP-AP.ZZ-0108 Attachment 11, Post-Fire Safe Shutdown Equipment - Administrative Controls, Rev. 11
SC.FP-SV.ZZ-0058, Inspection of Class 1 Fire Doors and Safety Related Areas for Transient Combustibles, Rev. 9
SC.FP-AP.ZZ-0003, Actions for Inoperable Fire Protection - Salem Station, Rev. 11
NC.FP-TI.ZZ-0402, Inspection and Maintenance of SCBA, Rev. 0
NC.NA-AP.ZZ-0045, Respiratory Protection Program, Rev. 6
SC.FP-SV.FBR-0026, Flood and Fire Barrier Penetration Seal Inspection, Rev 3
FRS-II-912, Pre-Fire Plan Salem Common Service Water Pipe Trench & Tunnel, Rev. 2
SC.FP-SV.FBR-0026 (Q), Flood and Fire Barrier Penetration Seal Inspection, Rev. 3

Notifications
20311158, 20311352, 20311358, 20311487, 20312090, 20312125, 20315110, 20315151, 20314657, 20315580, 20315668, 20315674, 20315740

Orders
60067007

Other Documents
Salem and Hope Creek Fire Impairment Log Book, dated 1/31/07
Fire Drill Title UADS5013107, Salem Unit 1 Turbine Building Elevation 88

Section 1R06: Flood Protection Measures

Procedures
S2.OP-AB.COND-0001, Loss of COND VAC, Rev. 12
S2.OP-AB.CW-0001, Circulating Water System Malfunction, Rev. 25
S2.OP-AR.ZZ-0007 G-43, TURB Area LVL Hi PMP Start, Rev. 39
S1.OP-AB.ZZ-0002, Flooding, Rev. 2
S2.OP-AB.ZZ-0002, Flooding, Rev. 2
SC.FP-SV.FBR-0026, Flood and Fire Barrier Penetration Seal Inspection, Rev. 3
SC.OP-AP.ZZ-0108 Section 11, Salem HELB Criteria, Rev. 11

Drawings
205223 (SH 1-3), No. 1 Unit Building & Equipment Drains - Conventional, Rev. 33, 37, & 40
205323 (SH 1-3), No. 2 Unit Building & Equipment Drains - Conventional, Rev. 35, 25, & 39
205226 SH 1 & 2, No. 1 Unit Floor Drains - Contaminated, Rev. 34 & 30
205326 SH 1 & 2, No. 2 Unit Floor Drains - Contaminated, Rev. 27 & 23
205227 SH 2, No. 1 Unit Equipment Vents & Drains - Contaminated, Rev. 23
205327 SH 2, No. 2 Unit Equipment Vents & Drains - Contaminated, Rev. 18

Evaluations
70035088, 70035399, 70042667, 70050702
S-C-A900-MEE-0158
S-C-BD-MEE-0554-0

Notifications
20169101, 20253937, 20303649, 20311133, 20311171, 20311172, 20311689, 20312386, 20312391, 20312396, 20312451, 20312777, 20312827, 20312851, 20313927, 20314684, 20314731, 20314827, 20315096

Operating Experience
NRC Information Notice 83-44, Supplement 1: Potential Damage to Redundant Safety Equipment as a Result of Backflow Through the Equipment and Floor Drain System, dated 8/30/90
NRC Information Notice 2005-30: Safe Shutdown Potentially Challenged By Unanalyzed Internal Flooding Events and Inadequate Design, dated 11/7/05

Other Documents
VTD 327743, Penetration Seal Inspection, dated 4/17/93, 10/02/94, 4/10/96, 5/12/97, 3/30/99, 1/8/01
Salem Generating Station Individual Plant Examination, dated July 1993

Section 1R07: Heat Sink Performance

Notifications
20314772, 20314842, 20315231

Section 1R11: Licensed Operator Requalification Program

Procedures
S2.OP-PT.GEN-0003, Main Generator Stator Temperatures, Rev. 9
S2.OP-AB.CC-0001, Component Cooling Abnormality, Rev. 11
2-EOP-Trip-1, Reactor Trip or Safety Injection, Rev. 26

Drawings
205331

Other Documents
Simulator Scenario Guide S-ESG-0701, Normal Ops and a Loss of CCW/Reactor Trip, Rev. 1

Section 1R12: Maintenance Effectiveness

Procedures
SC.MD-CM.SW-0008, Service Water Pump Headshaft Sleeve Replacement, Rev. 2
SC.MD-CM.SW-0006, Johnston Service Water Pump Inspection and Repair, Rev. 9
SH.MD-GP.ZZ-0008, Installation and Removal of Motors, Rev. 10
SC.MD-EU.SW-0002, Johnston Service Water Pump Removal and Installation, Rev. 17
SC.ER-DG.ZZ-0002, System Function Level Maintenance Rule Scoping VS. Risk Reference, Rev. 2
SC.ER-DG.ZZ-0003, Preventable and Repeat Preventable System Functional Failure Determination, Rev. 0
SC.MD-PM.AF-0003, 13 and 23 Auxiliary Feedwater Terry Turbine Disassembly, Inspection and Reassembly, Rev. 10
SC.MD-PM.AF-0004, 13 and 23 Turbine-Driven Auxiliary Feedwater Pump Disassembly, Inspection and Reassembly, Rev. 4
S2.OP-ST.AF-0003, Inservice Testing - 23 Auxiliary Feedwater Pump, Rev. 43
S2.RA-ST.AF-0003, Inservice Testing 23 Auxiliary Feedwater Pump Acceptance Criteria, Rev. 17
S2.OP-SO.AF-0001, Auxiliary Feedwater System Operation, Rev. 27

Completed Surveillances
S2.OP-ST.AF-0003, Inservice Testing - 23 Auxiliary Feedwater Pump, dated 9/8/06, 10/31/06, and 12/29/06

Notifications
20311128, 20311342, 20312163, 20312275, 20314620, 20310297, 20306266, 20305773, 20292252, 20291947, 20291480, 20257957, 20256660, 20311719, 20307094, 20301999, 20274829, 20274155, 20268361, 20316199, 20316264, 20316263, 20316262, 20291622 20001407, 20002429, 20162981, 20176252, 20180699, 20210118, 20220141, 20246051, 20246604, 20248351, 20276816, 20277433, 20286674, 20287566, 20303033, 20303115,

20304799, 20310888, 20312163, 20312827, 20312835, 20314524, 20314686, 20314734, 20314870, 20314877, 20315542, 20315803

Evaluations
70039419, 70062234, 70063198, 80089031, 80091603

Orders
60067443, 30022817, 70064075, 80077339, 70037915, 70039048, 70054883, 70058084, 60061351, 70054883, 70053248, 30003325, 30050996, 30091430, 60043335, 60058920

Operating Experience
NRC Information Notice 94-84: Air Entrainment in Terry Turbine Lubricating Oil System, dated 12/2/94
PSEG Response to NRC Information Notice, dated 3/27/95

Other Documents
VTD 320202, Johnston Pump Drawing, Rev. 9
VTD 320408, Technical Manual for Installation, Operation, and Maintenance of Johnston Pump Company 28 NMC - 3 Stage Service Water Pumps, Rev. 2
No. 23 TDAFW Pump Unavailability (Cumulus Database) through February 2007
MR PSFF Database, dated 2/27/07
PSEG Nuclear 10CFR 50.65 (a)(1) Goals, dated 2/27/07
S2AF - Auxiliary Feedwater Quarterly SHIP System Report, 4th Qtr 2006
S2AF - Auxiliary Feedwater Plant Health Committee System Presentation, 4th Qtr 2006
VTD No. 174547, Aux. Feed System

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
ER-AA-600, Risk Management, Rev. 5
ER-AA-600-1012, Risk Management Documentation, Rev. 6
S1.OP-SO.SW-0003, 12 Nuclear Service Water Header Outage, Rev. 25
S1.OP-SO.SW-0005, Service Water System Operation, Rev. 35

Drawings
205342 SH 5, SNGS No. 2 Unit Service Water Nuclear Area, Rev. 64
205242, SH 1-7, Revs. 90, 84, 86, 76, 74, 83, 03 (respectively), No.1 Unit Service Water Nuclear Area

Evaluations
70061111

Notifications
20310938, 20311844, 20311892, 20311894, 20312398, 20313022, 20314462, 20314696, 20314712, 20267659, 20267664, 20276514, 20316073 , 20316110, 20316124

Orders
60068282, 70055420

Other Documents
Risk-Informed Inspection Notebook For Salem Generating Station, Rev. 2
WCDs 4193071 and 4192125
SGS Unit 2 PRA Risk Evaluation Form for work week number 007 (February 11 to 17, 2007)
SGS Unit 2 PRA Risk Evaluation Form for work week number 002 (January 7 to 13, 2007)
SGS Unit 1 PRA Risk Evaluation Form for work week number 003 (January 14 to 20, 2007)
Risk Management Documentation No. SA-A4-2007-001, Refined Approach for Calculating Risk Associated with Block Valve 2PR7 Closure, Rev. 0
Risk-Informed Inspection Notebook For Salem Generating Station, Rev. 2
DE-CB.SW-0047, Configuration Baseline Documentation for Service Water System, Rev. 6
Risk-Informed Inspection Notebook for Salem Generating Station, Rev. 2
Salem Inservice Testing Program Basis - Service Water Valves, Rev. 8
SGS PRA System Notebook, Service Water System, Rev. 3
SGS Unit 1 PRA Risk Evaluation Form for work week number 011, Rev. 1 (March 11 to 17, 2007)
Techical Specification 3.7.4.1, Service Water System
Updated Final Safety Analysis Report, Section 9.2.1, Service Water System
Weekly Management Summary, Work Week 11 (3/11/07 - 3/17/07)

Section 1R15: Operability Evaluations

Procedures
SC.OP-AP.ZZ-0108, Operability Assessment and Equipment Control Program, Rev. 11
S2.OP-AB.CC-0001, Component Cooling Abnormality, Rev. 11
SC.OP-AP.ZZ-0108, Operability Assessment and Equipment Control Program, Rev. 11
S2.OP-SO.SW-0001, Service Water Pump Operation, Rev. 22
S2.OP-SO.SW-0005, Service Water System Operation, Rev. 38
SC.OP-SO.ZZ-0003, Component Biofouling, Rev. 1

Evaluations
70058966

Drawings
203575, 203577, 237957

Notifications
20311308, 20311668, 20311724, 20311803, 20312069, 20308265, 20308301, 20310615, 20307235, 20310248, 20313219, 20312989, 20312512, 20312180, 20314524, 20314620, 20315182, 20315317

Orders
70064694, 80088622, 70064846, 80088621, 70041288, 70064562, 70064871, 60067575, 60066997, 70065677, 70065131, 60067986

Other Documents
S-C-AUX-MDC-0737, Loss of Ventilation During Station Blackout, Rev. 2
S-2-ABV-MDC-2041, Salem Unit 2 Auxiliary Building Temperature Calculation - Normal and Emergency Modes, Rev. 1

S-C-AF-MEE-1749, Effect of Loss of Room Cooler for Turbine Driven Auxiliary Feedwater Pump Room, Rev. 0
S-C-AUX-MDC-0738, SBO - Mechanical Heat Loads in Turbine-Driven Auxiliary Feedwater Pump Rooms, Rev. 1
ACM 07-012, S2SW -2SWE8 22 Service Water Strainer, dated 2/28/07

Section 1R17: Permanent Plant Modifications

Procedures
SH.MD-SP.FBR-0001, Installation and Repair of Penetration Seals, Rev. 4
SH.MD-SP.FBR-0002, Damming and Ceramic Fiber Seal Installation, Rev. 1
SH.MD-SP.FBR-0003, Installation and Repair of Silicone Foam Materials, Rev. 0

Notifications
20308308, 20309371, 20308772, 20309372, 20308265, 20308301, 20314748

Orders
80088621, 80088622, 60063452, 60063453, 60063454, 60063455, 70064694

Other Documents
Test Plan No. 80090464, Salem Unit 1 ABV Supply Fan Controls Modification, Rev. 5
Test Plan No. 80090465, Salem Unit 2 ABV Supply Fan Controls Modification, Rev. 6

Section 1R19: Post-Maintenance Testing

Procedures
SC.MD-PM.CH-0002, Chiller Condenser Heat Exchanger Internal Inspection and Leak Check, Rev. 11
SC.MD-PM.ZZ-0052, Disassembly, Inspection and Reassembly of Velan Swing Check Valves Mark, Rev. 5
S2.OP-ST.CH-0004, Chilled Water System - Chillers, Rev. 13
S2.OP-ST.SW-0009, Inservice Testing Service Water Valves (Penetration Area), Rev. 8
S2.OP-ST.CVC-0003, Inservice Testing - 21 Charging Pump, Rev. 19
SH.MD-SP.ZZ-0002, Use of Freeze Seals, Rev. 5
SH.MD-GP.ZZ-0022, Bolt Torquing and Bolting Sequence Guidelines, Rev. 1

Drawings
242774

Notifications
20260881, 20135995, 20310807, 20312286, 20310656, 20309857, 20309864, 20312625, 20303290, 20307997, 20302303, 20271574, 20307997, 20311578, 20313928

Orders
60059304, 60036717, 30100378, 60067302, 30100170, 30143499, 60063444, 60065945, 80045601, 60029010, 70064882, 60067562, 60054537

Other Documents
ER-AA-335-1008, Surface Examination Records before and after freeze seal to support 2CV141 replacement
ER-AA-335-1008, Ultrasonic Thickness Examination Record for freeze seal to support 2CV141 replacement

Section 1R22: Surveillance Testing

Procedures
S1.IC-ST.SSP-0010, SSPS Train A-Reactor Trip Breaker UV Coil and Auto Shunt Trip, Rev. 14
S2.OP-ST.CC-0003, Inservice Testing - 23 Component Cooling Pump, Rev. 20
S2.RA-ST.CC-0003, 23 Component Cooling Pump Surveillance Data Acceptance Criteria, Rev. 12
S1.OP-ST.RHR-0002, Inservice Testing - 12 Residual Heat Removal Pump, Rev. 13
S1.RA-ST.RHR-0002, Inservice Testing 12 Residual Heat Removal Pump Acceptance Criteria, Rev. 6
S1.OP-St.RCS-0001, Reactivity Control System Rod Control Assemblies, Rev. 18
S1.OP-ST.RC-0007, Seal Injection Flow, Rev. 5
S2.OP-ST.RHR-0002, Inservice Testing - 22 Residual Heat Removal Pump, Rev. 24
S1.OP-ST.DG-0002, 1B Diesel Generator Surveillance Test, Rev. 41
S1.RA-ST.DG-0002, 1B Diesel Generator Surveillance Test Acceptance Criteria, Rev. 4
S1.OP-ST.DG-0013, 1B Diesel Generator Endurance Run, Rev. 16
S1.OP-ST.RC-0008, Reactor Coolant System Water Inventory Balance, Rev. 19
S1.OP-AB.RC-0001, Reactor Coolant System Leak, Rev. 8

Completed Surveillances
S1.OP-ST.RC-0008, Reactor Coolant System Water Inventory Balance, dated 2/23-27/07
S1.OP-ST.DG-0012, 1A Diesel Generator Endurance Run, dated 2/27/07

Drawings
205228

Notifications
20311105, 20311818, 20312025, 20312334, 20310526, 20309710, 20309812, 20309791, 20313153, 20312988, 20312958, 20312795, 20312779, 20315111, 20266883, 20314804, 20314940

Orders
50100886, 50100948, 30144736, 50100783

Evaluations
70052759

Other Documents
DE-CB.RHR-0030, Configuration Baseline Documentation for the Residual Heat Removal System, Rev. 4
Salem Inservice Testing Program Basis Data Sheets - Valves for 22RH8
VTD 106263, Crane Company 300 LB. Cast Alloy Steel Swing Check Valve, Rev. 6

Section 1EP2: Alert and Notification System (ANS) Evaluation

Other Documents
Final Rep - 10 Design Review Report
Siren Test Results from 2006 & 2007 (bi-weekly silent test & quarterly audible test)
Maintenance Records from November 2005

Section 1EP3: Emergency Response Organization (ERO) Staffing and Augmentation System

Other Documents
Salem/Hope Creek Emergency Plan
ERO Member Roster

Section 1EP4: Emergency Action Level (EAL) and Emergency Plan Changes

Other Documents
All 50.54(q) E-Plan and EAL changes from 2005 & 2006

Section 1EP5: Correction of Emergency Preparedness Weaknesses

Other Documents
LS-AA-120 "Issue Identification and Screening Process," Rev. 6
LS-AA-125 "Corrective Action Program (CAP) Procedure," Rev. 11
All Issue Reports related to EP from 12/19/05 - 3/27/07
Drill Critique Reports – 2005 & 2006
50.54(t) Audits done by the Nuclear Oversight Committee (2006 & 2007)

Orders
70053308, 70053597, 70053973, 70054047, 70054318

Section 1EP6: Drill Evaluation

Other Documents
Salem - Self Evaluated Exercise, S07-07
2007 Tabletop Training Session Agenda and Timeline for TSC - Salem
Salem Generating Station Event Classification Guide
Artificial Island Emergency Plan
NC.EP-EP.ZZ-0201, TSC - Integrated Engineering Response, Rev. 09

Section 2OS1: Access Control to Radiologically Significant Areas

Procedures
RP-AA-220, Rev 3, Bioassay Program
RP-AA-222, Rev 1, Methods for estimating Internal Exposure from In Vivo and In Vitro Bioassay Data
RP-AA-460, Rev 11, Controls for High and Very High Radiation Areas
RP-AA-460-1001, Rev 1, Additional High Radiation Exposure Controls

Section 2OS2: ALARA Planning and Controls

Procedures
RP-AA-270, Rev 3, Prenatal Radiation Exposure
RP-AA-400, Rev 4, ALARA Program
RP-AA-1001, Rev 0, Establishing Collective radiation Exposure Estimates and Goals
RP-AA-401, Rev 7, Operational ALARA Planning and Controls

Other Documents

Radiation Protection Job Guide:	ISI Activities; Fuel Movement; Seal Table Room; Upper Internals Removal/Replacement for 1R18
Fastscan Whole Body Counter:	System Calibration, dated March 25, 2006; Co-60 and Cs-137 control chart for period 1/2/07 thru 2/6/07

Section 2OS3: Radiation Monitoring Instrumentation

Procedures
NVLAP Personnel Dosimetry Performance Testing Report for Global Dosimetry Solutions, Inc., dated August 31, 2005
NVLAP On-Site Assessment of Global Dosimetry Solutions, Inc., dated April 20, 2006
NVLAP Personnel Dosimetry Performance Testing Report for Landauer, Inc., dated January 27, 2006

Section 4OA1: Performance Indicator (PI) Verification

Procedures
EP-AD-022, " Nuclear Emergency Planning Performance Indicators," Rev. 2

Other Documents
ERO Drill Participation PI data, 1Q06, 2Q06, 3Q06 & 4Q06
Public Notification System PI data, 1Q06, 2Q06, 3Q06 & 4Q06
DEP PI data, 1Q06, 2Q06, 3Q06 & 4Q06

Section 4OA5: Other Activities

Other Documents
Report MPR 0108-0301-18, Revision 1, December 8, 2005
Report MPR -2613, Revision 2, May 2006
Report MPR-2634, Revision 1, May 2006
Structural Examination of Spent Fuel Pool Structures, May 12, 2006
Quarterly Remedial Action Report, Fourth Quarter 2006, March 2007
In–situ Test Plan -Salem FHB Structural Assessment, March 14, 2007
Response to Unresolved Item, dated March 30, 2007

LIST OF ACRONYMS

ABV	Auxiliary Building Ventilation
ACM	Adverse Condition Monitoring & Contingency Plan
AFW	Auxiliary Feedwater
ALARA	As Low As is Reasonably Achievable
ANS	Alert and Notification System
CC	Component Cooling
CEDE	Committed Effective Dose Equivalent
CFCU	Containment Fan Coil Unit
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
DEP	Drill and Exercise Performance
EAL	Emergency Action Level
ECAC	Emergency Control Air Compressor
EOF	Emergency Operations Facility
EP	Emergency Preparedness
ERO	Emergency Response Organization
FOTPs	Fuel Oil Transfer Pumps
HELB	High Energy Line Break
IMC	Inspection Manual Chapter
MR	Maintenance Rule
NCV	Non-cited Violation
NOTF	Notification
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
OA	Other Activities
OpESS	Operating Experience Smart Sample
PARS	Publicly Available Records
PI	Performance Indicator
PORV	Pilot Operated Relief Valve
PSEG	Public Service Enterprise Group Nuclear LLC
PSFF	Preventable System Functional Failure
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RWP	Radiation Work Permit
S1R18	Salem Generating Station Unit 1 Eighteenth Refueling Outage
SAC	Service Air Compressor
SBO	Station Blackout
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SGS	Salem Generating Station
SPT	Station Power Transformer
SRA	Senior Reactor Analyst
SW	Service Water
SWP	Service Water Pump
SWS	Service Water Strainer

TDAFW	Turbine Driven Auxiliary Feedwater
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VHRA	Very High Radiation Area
VTD	Vendor Technical Document
WCD	Work Clearance Document
WO	Work Order