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

May 15, 2008

Mr. William Levis
President and Chief Nuclear Officer
PSEG Nuclear LLC
80 Park Plaza, T4B
Newark, NJ 07102

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 - NRC INTEGRATED INSPECTION REPORT 05000272/2008002 and 05000311/2008002

Dear Mr. Levis:

On March 31, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Salem Nuclear Generating Station, Units 1 and 2. The enclosed integrated inspection report documents the inspection results discussed on April 4, 2008, with Mr. Robert Braun 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 two self-revealing findings of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. Additionally, the report documents two licensee-identified violations which were determined to be of very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCV) consistent with Section VI.A.1 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 05000272/2008002 and 05000311/2008002
w/Attachment: Supplemental Information

cc w/encl:
T. Joyce, Senior Vice President, Operations
R. Braun, Site Vice President
K. Chambliss, Director, Nuclear Oversight
B. Clark, Director of Finance
G. Gellrich, Salem Plant Manager
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M. Wetterhahn, Esquire, Winston and Strawn, LLP
L. Peterson, Chief of Police and Emergency Management Coordinator
P. Baldauf, Assistant Director, NJ Radiation Protection Programs
P. Mulligan, Acting-Manager, NJ Bureau of Nuclear Engineering
H. Otto, Ph.D., Administrator, DE Interagency Programs, DNREC Div of Water Resources
Consumer Advocate, Office of Consumer Advocate, Commonwealth of Pennsylvania
N. Cohen, Coordinator - Unplug Salem Campaign
E. Zobian, Coordinator - Jersey Shore Anti Nuclear Alliance
E. Eiola, Assistant Plant Manager

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REGION I

Docket Nos:	50-272, 50-311
License Nos:	DPR-70, DPR-75
Report No:	05000272/2008002 and 05000311/2008002
Licensee:	PSEG Nuclear, LLC
Facility:	Salem Generating Station, Units 1 & 2
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Dates:	January 1, 2008 through March 31, 2008
Inspectors:	D. Schroeder, Senior Resident Inspector H. Balian, Resident Inspector J. Orr, Senior Reactor Engineer S. Pindale, Senior Reactor Engineer J. Furia, Senior Health Physicist S. Smith, Reactor Engineer J. Tomlinson, Project Engineer L. Casey, Reactor Engineer
Approved By:	Arthur L. Burritt, Chief Projects Branch 3 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000272/2008002, 05000311/2008002; 01/01/2008 – 03/31/2008; Salem Nuclear Generating Station Units 1 and 2; Maintenance Effectiveness, Operability Evaluations.

The report covered a three-month period of inspection by resident inspectors and announced inspection by a regional radiation specialist and a regional reactor safety inspector. Two Green non-cited violations (NCVs), 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: Initiating Events

- Green. The inspectors identified a self-revealing non-cited violation of Technical Specification 6.8.1.a, "Procedures and Programs " when the 23 chiller failed to start on January 22, 2008. PSEG personnel did not start the 23 chiller and verify proper operation before removing the 21 and 22 chillers from service. This resulted in the plant operating for five hours with all three chillers out of service. The inspectors determined that the procedure for chiller operation was inadequate because it did not provide sufficient guidance to operators when removing two chillers from service. PSEG's corrective actions included revising the chiller operating procedure and replacement of the solenoid valve that caused the 23 chiller not to start.

  The finding is more than minor because it is associated with the configuration control attribute of the Initiating Events cornerstone, and it adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, unavailability of all three chillers increased the likelihood of a loss of control air. The inspectors determined that the finding was of very low safety significance using the Salem plant-specific Phase 2 pre-solved worksheets in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations."

  This performance deficiency has a cross-cutting aspect in the area of human performance because PSEG personnel did not effectively communicate human error prevention techniques, such as holding pre-job briefings, self checking, and peer checking, and these techniques were not used commensurate with the risk of the assigned task [H.4(a)]. Specifically, PSEG personnel did not verify the proper operation of the 23 chiller before removing the 21 and 22 chillers from service. (Section 1R15)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a self-revealing non-cited violation of Technical Specification 6.8.1.a, "Procedures and Programs." The inspectors determined that maintenance procedures for the 25 service water strainer (SWS) blow down valve (25SW24) were inadequate because they did not ensure proper alignment of the valve and actuator. This resulted in the 25 service water pump (SWP) being inoperable for approximately 35 hours. PSEG returned the 25 SW train to service following completion of corrective maintenance on the blow down valve and verification of proper alignment of the valve and actuator. PSEG also revised the applicable maintenance procedures for future maintenance activities.

  The finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. 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 was of very low safety significance.

  The finding has a cross-cutting aspect in the area of problem identification and resolution because PSEG did not implement and institutionalize operating experience, including internally generated lessons learned, through changes to station processes, procedures, equipment, and training programs [P.2(b)]. Specifically, PSEG procedures did not incorporate internal operating experience to ensure proper alignment between the service water strainer blow down valve actuator and valve stem. (Section 1R12)

B. Licensee Identified Violations

Violations of very low safety significance, which were identified by PSEG have been reviewed by the inspectors. Corrective actions taken or planned by PSEG have been entered into PSEG's corrective action program. These violations and corrective action tracking numbers are listed in Section 40A7 of this report.

REPORT DETAILS

Summary of Plant Status

Salem Nuclear Generating Station Unit 1(Unit 1) began the period in Mode 3 (hot standby) following a trip on December 28, 2007. Operators returned Unit 1 to full power on January 3, 2008. On March 20, operators lowered Unit 1 to 50% power in response to circulating water system degradation. Operators raised Unit 1 to 90% power on March 22 and returned Unit 1 to full power on March 23. On March 29, operators lowered Unit 1 to 83% power to support emergent maintenance in the Salem switchyard. Operators raised Unit 1 power to 93% on March 30. Operators kept Unit 1 at 93% power for the remainder of the inspection period to support offsite transmission line maintenance.

Salem Nuclear Generating Station Unit 2 (Unit 2) began the period at full power. End of cycle coast down commenced on February 21, 2008, when operators began reducing power to maintain reactor coolant temperature on program. Operators shut down Unit 2 on March 11 to start the sixteenth refueling outage of Unit 2 (S2R16). Mode 5 (cold shutdown) was reached on March 12; Mode 6 (refueling) was reached on March 13; and Unit 2 was defueled on March 17. The reactor coolant system (RCS) piping was subsequently drained to support replacement of all four steam generators. Unit 2 was defueled and drained for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 1 sample)

a. Inspection Scope

The inspectors completed one impending adverse weather inspection sample for the onset of high levels of river detritus. The inspectors reviewed PSEG's weather preparation activities related to the potential for river grass intrusion conditions. Inspectors assessed implementation of PSEG's grassing readiness plan through plant walk downs, corrective action program review, and discussions with cognizant managers and engineers. Documents reviewed by inspectors are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04 - 3 samples, 71111.04S – 1 sample)

.1 Partial Walkdown

a. Inspection Scope

The inspectors completed three partial walk down inspection samples. The inspectors completed walk downs of portions of the systems listed below to verify the operability of redundant or diverse trains and components when safety equipment was unavailable. 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 properly utilized its corrective action program to identify and resolve equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers. Documents reviewed are listed in the Attachment.

- 1A & 1C emergency diesel generators (EDG) and 11 diesel fuel oil transfer pump (DFOTP) during planned unavailability of the 1B EDG on February 5, 2008;
- Unit 1 control air (CA) during planned unavailability of the 1 emergency control air compressor (ECAC) on February 14, 2008; and
- 1B & 1C EDGs and 12 DFOTP during planned unavailability of the 1A EDG on February 26, 2008.

.2 Complete Walkdown

a. Inspection Scope

The inspectors conducted one complete walk down of the Unit 2 chemical and volume control system (CVCS). The inspectors used PSEG procedures and other documents to verify proper system alignment and functional capability. The inspectors independently verified the alignment and status of CVCS pump and valve electrical power, labeling, operator workarounds, hangers and supports, and associated support systems. The walkdowns also included evaluation of system piping and equipment to verify pipe hangers were in satisfactory condition, oil reservoir levels were normal, pump rooms and pipe chasers were adequately ventilated, radiation and containment areas were properly marked, system parameters were within established ranges, and equipment deficiencies were appropriately identified. The inspectors reviewed corrective action evaluations associated with the system to determine whether equipment alignment problems were identified and appropriately resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05 - 6 samples)

Fire Protection - Tours

a. Inspection Scope

The inspectors completed six fire protection quarterly inspection samples. The inspectors conducted tours of the 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 inspectors evaluated the fire protection areas listed below.

- Unit 1 and Unit 2 CVCS Hold-up Tank Area;
- Unit 1 and Unit 2 4160 V Switchgear and Battery Rooms; and
- Unit 1 and Unit 2 Charging Pump, Spray Additive Tank Area.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors completed one flood protection measures inspection sample. The inspectors evaluated flood protection measures for the Unit 1 and Unit 2 relay rooms and electrical penetration rooms. 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 also reviewed the results of flood barrier penetration seal inspections, flooding evaluations, preventive maintenance history, and corrective action notifications associated with flood protection measures. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11 - 1 sample)

a. Inspection Scope

The inspectors completed one licensed operator requalification program sample. The inspectors observed a simulator training scenerio administered on February 4, 2008, to assess operator performance and training effectiveness. The scenario involved a failed open turbine bypass valve, a main turbine lube oil leak and a faulted steam generator. An abnormal transient without trip on the opposite unit was also included to evaluate the crew's Emergency Action Level declarations and associated notifications. The inspectors verified operator actions were consistent with operating, alarm response, abnormal, and emergency procedures. The inspectors assessed simulator fidelity and verified that the evaluators identified deficient operator performance where appropriate. The inspectors also 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 - 2 samples)

a. Inspection Scope

The inspectors completed two maintenance effectiveness inspection samples for the items listed below. The inspectors reviewed PSEG's process for monitoring equipment performance and assessing preventive maintenance effectiveness. The inspectors verified that systems and 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 (NOTFs), and preventive maintenance tasks. The documents reviewed are listed in the Attachment.

- 12 Station Power Transformer (SPT) and 1B Auxiliary Power Transformer (APT); and
- Unit 1 and 2 service water strainer blow down valves (SW24s).

b. Findings

Introduction: A self-revealing non-cited violation of Technical Specification 6.8.1.a, "Procedures and Programs." The inspectors determined that maintenance procedures for the 25 service water strainer (SWS) blow down valve (25SW24) were inadequate. This resulted in the 25 service water pump (SWP) being inoperable for approximately 35 hours. This finding was determined to be of very low safety significance (Green).

Description: On January 14, 2008, PSEG performed preventive maintenance on the 25 service water strainer blow down valve under work order 30142021. The work consisted of removing the service water strainer blow down valve pneumatic actuator from the valve, removing the valve from the service water (SW) system, and performing internal inspections and maintenance on both the valve and actuator. The valve was then reinstalled and the actuator was reattached. On January 21, 2008, the 25 SW strainer was found clogged and the 25 SW pump was declared inoperable as a result of the service water strainer blow down valve not opening fully to backwash the strainer. Maintenance technicians subsequently found that valve pneumatic actuator was not correctly aligned to the valve stem. This misalignment caused the valve to bind, preventing it from fully opening.

The preventive maintenance was controlled by two PSEG procedures. Mechanical maintenance (MM) technicians used SC.MD-PM.ZZ-0210, "Disassembly, Inspection, and Reassembly of BNL Ball Valve Mark # AA-303, BA-154, and AA-319". Instrumentation and Controls (I&C) technicians used SC.IC-PM.ZZ-0008, "Maintenance of Bettis Actuator (Model CB)." The inspectors determined that these procedures did not provide adequate guidance to ensure that technicians properly aligned the valve and actuator. Previous operating experience at Salem with similar air-operated ball valves, SW 39 and SW 102, demonstrated that proper alignment between the actuator and the valve was necessary to ensure proper valve function, but procedures were not revised to reflect this experience. PSEG returned the 25 SW train to service following completion of corrective maintenance on the blow down valve and verification of proper alignment of the valve and actuator. PSEG also revised the applicable maintenance procedures for future maintenance activities.

Analysis: The inspectors determined that inadequate maintenance procedures for the 25 SW strainer blow down valve is a performance deficiency. The performance deficiency is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and is adversely affected the 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 availability of the 25 SW pump. 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 was of very low safety significance because the finding was not a design or qualification deficiency, did not represent a loss of safety function for system or a single train of a system, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The performance deficiency has a cross-cutting aspect in the area of problem identification and resolution because PSEG did not implement and institutionalize operating experience, including internally generated lessons learned, through changes to station processes, procedures, equipment, and training programs. Specifically, PSEG procedure "Maintenance of Bettis Actuator (Model CB)" did not incorporate internal operating experience to ensure proper alignment between the service water strainer blow down valve actuator and valve stem. [P.2(b)].

Enforcement: Technical Specification 6.8.1.a requires establishment, implementation and maintenance of written procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Section 9 requires that maintenance affecting the performance of safety-related equipment be performed per written procedures, documented instructions or drawings appropriate to the circumstances. Contrary to the above, procedures used to perform maintenance on the service water strainer blow down valves were not adequately maintained because they did not incorporate relevant internally generated lessons learned. The service water strainer blow down valve failed to open fully, rendering the 25 SW pump unavailable for 35 hours, starting on January 21, 2008. Because this finding is of very low safety significance, and has been entered into the corrective action program in notifications 20353264 and 20354329, this violation is being treated as a NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000311/2008002-01, 25SW24 Failure Caused 25 Service Water Pump Unavailability)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 5 samples)

a. Inspection Scope

The inspectors completed five maintenance effectiveness and emergent work control inspection samples. The inspectors reviewed the maintenance activities to verify that the appropriate risk assessments were performed as specified 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. PSEG's risk management actions were reviewed during shift turnover meetings, control room tours, and plant walk downs. The inspectors also used PSEG's on-line risk monitor (EOOS, Equipment Out-Of-Service workstation) to gain insights into the risk associated with these plant configurations. The inspectors reviewed NOTFs documenting problems associated with risk assessments and emergent work evaluations. Documents reviewed are listed in the Attachment. The inspectors assessed the plant configurations listed below.

- Emergent unavailability of the station gas turbine generator and 12 chiller concurrent with planned unavailability of the 11 station power transformer, 11 and 12 containment fan coil units (CFCU), and 13 auxiliary building exhaust fan.
- Planned unavailability of the unit 1 spent fuel pool heat exchanger for preventive maintenance.
- Planned unavailability of the 1C emergency diesel generator (EDG), 11 station power transformer (SPT), 13 chiller, 12 penetration exhaust fan, and 11 service water (SW) accumulator concurrent with performance of SSPS train A testing.
- Planned unavailability of the 1A EDG concurrent with transmission system maintenance on the 5021 East Windsor 500 kV line.
- Emergent unavailability of the 23 chiller and 25 service water pump concurrent with planned unavailability of the 21 chiller, 22 chiller, 23 service water pump, and gas turbine generator.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 6 samples)

a. Inspection Scope

The inspectors completed six operability evaluation inspection samples. 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 screenings. Documents reviewed are listed in the Attachment. The inspectors evaluated the issues listed below.

- Operability of the 2C emergency diesel generator given failure of one of two turbo boost air control valves (21DA23C);
- Operability of axial flux difference (AFD) and containment sump inventory monitoring on Unit 1 given repeated failures of the auxiliary alarm annunciator system;
- Operability of the Unit 2 chilled water system given emergent failure of the 23 chiller while the 21 and 22 chillers were out of service for planned maintenance;
- Operability of the 3 service water (SW) bay with the service water ventilation system for the #3 bay control room degraded;
- Operability of the 16 SW pump (SWP) following failure of the in-service flow test; and
- Operability of the Unit 2 emergency core cooling system (ECCS) given degradation of accumulator fill valve 2SJ19.

b. Findings

Introduction: A self-revealing non-cited violation of Technical Specification 6.8.1.a, "Procedures and Programs " was identified when the 23 chiller failed to start on January 22, 2008. The procedure for chiller operation was inadequate because it did not provide guidance for the removal of two chillers from service. This finding was determined to be of very low safety significance (Green).

Description: On January 22, 2008, at 4:20 a.m., PSEG removed the 21 and 22 chillers from service to support isolation and repair of chiller service water vent valve, 22SW386. At 8:20 a.m., PSEG determined that Unit 2 chilled water temperature was 78°F and that the 23 chiller was not removing the associated heat load. The 23 chiller should have started and loaded as chilled water temperature rose above 55 degrees Fahrenheit. Consequently, PSEG entered Technical Specification 3.0.3, which requires initiation of a plant shutdown within one hour, and initiated activities to return all three chillers to service. At 9:16 a.m., the 23 chiller was returned to an operable, but degraded status.

At 10:15 a.m., PSEG declared the 22 chiller operable, exited Technical Specification 3.0.3 and terminated preparations to shutdown Unit 2.

PSEG procedure S2.OP-ST.CH-0004, "Chilled Water System – Chillers," did not specifically address the removal of two chillers from service. PSEG personnel did not start the 23 chiller and verify proper operation before removing the 21 and 22 chillers from service. In the existing plant configuration, the 23 chiller should have automatically started and operated continuously with the 21 and 22 chillers removed from service. However, the chiller did not start because the chiller service water inlet valve 23SW92, failed to open when the 23 chiller reached the starting temperature set point of 55° F. All three chillers were inoperable for a period of approximately five hours.

PSEG's corrective actions included revising the chiller operating procedure and replacement of the solenoid valve that caused the chiller not to start.

Analysis: The inspectors determined that the inadequacy of PSEG procedure S2.OP-ST.CH-0004, "Chilled Water System – Chillers," was a performance deficiency. This procedure did not specifically address the removal of two chillers from service. The performance deficiency is more than minor because it is associated with the configuration control attribute of the Initiating Events cornerstone, and it adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, unavailability of all three chillers increased the likelihood of a loss of control air. Per Inspection Manual Chapter (IMC) 0609, Attachment 0609.04, "Initial Screening and Characterization of Findings," the inspectors conducted a Phase 1 screen and determined that this finding required a Phase 2 analysis because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available.

The inspector determined that the finding was of very low safety significance (Green) using the Salem plant-specific Phase 2 pre-solved worksheets in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The estimated increase in core damage frequency was approximately 1 in 100,000,000 (actual was E-8) assuming the reactor was operating at full power and all three chillers were out-of-service for five hours which resulted in an increase in the loss of control air (LCA) initiating event frequency. An evaluation of the Salem plant-specific Phase 2 pre-solved worksheets showed that two sequences were dominant. The first involved an LCA with a failure of the following components/functions: station blackout compressor, auxiliary feedwater, and high pressure recirculation. The second involved an LCA with a failure of the following components/functions: station blackout compressor, auxiliary feedwater, and feed and bleed. Service water has the ability to be manually aligned to the Unit 2 control air compressor through a spool piece and was available throughout the event and could have provided some mitigation capability.

This performance deficiency has a cross-cutting aspect in the area of human performance because PSEG personnel did not effectively communicate human error prevention techniques, such as holding pre-job briefings, self checking, and peer

checking. These techniques were not used commensurate with the risk of the assigned task. [H.4(a)] Specifically, PSEG personnel did not verify the proper operation of the 23 chiller before removing the 21 and 22 chillers from service.

Enforcement: Technical Specification 6.8.1.a requires establishment, implementation and maintenance of written procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Section 3 requires that start-up, operation, and shut down of safety-related equipment be performed per written procedures. Contrary to the above, PSEG procedure S2.OP-ST.CH-0004, "Chilled Water System – Chillers," did not specifically address the removal of two of the three installed chillers from service. The 23 chiller was not started prior to removal of the 21 and 22 chillers from service. When the 23 chiller did not start automatically, there were no operable chillers on Unit 2 for a period of five hours on January 22, 2008. Technical Specification 3.0.3 was entered upon discovery of this condition. Because this finding is of very low safety significance and has been entered into the corrective action program in notification 20353297, this violation is being treated as an NCV, consistent with section VI.A of the NRC Enforcement Policy. **(NCV 05000311/2008002-02, Salem Unit 2 Loss of All Three Chillers)**

1R18 Plant Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors completed one plant modifications inspection sample by reviewing one temporary modification. The inspectors reviewed field change 1EC-3595 for the 13 auxiliary feedwater (AFW) high energy line break panel. This field change installed a seal for a gap between the panel and its frame pending a permanent repair. The inspectors review included system walk downs, interviews with plant engineers, and functional comparison of the temporarily modified configuration to the UFSAR description. Inspectors reviewed the 10 CFR 50.59 screening against the system design basis documentation. The inspectors verified that the modifications did not affect system operability.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 6 samples)

a. Inspection Scope

The inspectors completed six post-maintenance testing inspection samples. The inspectors observed portions of and/or reviewed the results of the post-maintenance test activities for the maintenance items listed below. The inspectors verified that the effect of testing on the plant was adequately addressed by control room and engineering personnel; testing was adequate for the maintenance performed; acceptance criteria were clear, demonstrated operational readiness and were consistent with design and licensing basis documentation; test instrumentation was calibrated, and the appropriate

range and accuracy for the application; tests were performed, as written, with applicable prerequisites satisfied; and equipment was returned to an operational status and ready to perform its safety function. Documents reviewed are listed in the Attachment.

- Work order (WO) 30097691, Unit 1 spent fuel pool (SFP) heat exchanger eddy current testing
- WO 60074110, 1C emergency diesel generator K1C relay replacement;
- WO 20350143, 12 station power transformer tap changer component replacement
- WO 30142021, 25 service water strainer (SWS) blow down valve corrective maintenance (25SW24)
- WO 60074787, 11 SWS motor replacement
- WO 60074019, 1B EDG voltage regulator (VR) card repairs

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 6 samples)

a. Inspection Scope

The inspectors completed six surveillance testing inspection samples. The inspectors observed portions of and/or reviewed results for the 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 inspectors evaluated the surveillance tests listed below:

- S2.OP-ST.RC-0008, Unit 2 reactor coolant system (RCS) water inventory balance including a review of troubleshooting to identify the cause of erratic, unusually high unidentified RCS leakage;
- S2.OP-ST.CVC-0003, 21 charging pump in-service testing (IST);
- S1.OP-ST.RC-0007, seal injection flow verification;
- S1.OP-ST.500-0001, electrical power systems AC sources alignment with one of two technical specification required off-site electrical power sources unavailable;
- S2.OP-ST.SJ-0001, 21 safety injection (SI) pump IST; and
- S1.OP-ST.CS-0001, 11 containment spray (CS) pump IST.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 1 sample)

a. Inspection Scope

The inspectors completed one drill evaluation inspection sample. On February 20, 2008, the inspectors observed the drill from the control room simulator and the technical support center. The inspectors attended the drill debrief to ensure that PSEG captured drill deficiencies in their critique. The inspectors evaluated the drill performance relative to developing event classifications and notifications. The inspectors reviewed the Salem Event Classification Guides and Emergency Plans. The inspectors referenced Nuclear Energy Institute 99-02, "Regulatory Assessment PI Guideline," Revision 5, and verified that PSEG correctly counted the drill's contribution to the NRC PI for drill and exercise performance.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment & Monitoring Systems (71122.01 - 11 samples)

a. Inspection Scope

The inspectors reviewed all radiological effluent release reports issued since the previous inspection of this area to verify that the program was implemented as described in the radiological effluent technical specification/off-site dose calculation manual (RETS/ODCM). The inspectors reviewed the reports for significant changes to the ODCM and to radioactive waste system design and operation. The inspectors determined whether the changes to the ODCM were made in accordance with Regulatory Guide 1.109 and NUREG-0133 and were technically justified and documented. The inspectors determined whether the modifications made to radioactive waste system design and operation changed the dose consequence to the public. The inspectors evaluated PSEG's analysis for any additional discharge pathways as a result of a spill, leak, routine, normal, abnormal, or unexpected liquid discharge or gaseous discharges that may have developed since the previous inspection. The inspectors verified that PSEG has records for sampling locations, the type of monitoring and the frequency of sampling. The inspectors verified that technical and/or 10 CFR 50.59 reviews were performed when required. The inspectors also determined whether radioactive liquid and gaseous effluent radiation monitor set point calculation methodology changed since completion of the modifications.

The inspectors verified that any anomalous results reported in the current radiological effluent release report were entered in PSEG's corrective action program, and adequately resolved.

The inspectors reviewed RETS/ODCM to identify the effluent radiation monitoring systems and flow measurement devices. The inspectors reviewed any effluent radiological occurrence performance indicator incidents for onsite follow-up. The inspectors reviewed PSEG self assessments, audits, and licensee event reports that involved unanticipated offsite releases of radioactive material.

The inspectors reviewed the UFSAR description of all radioactive waste systems.

The inspectors reviewed PSEG's RETS/ODCM to identify PSEG's program for identifying potential contaminated spills and leakage and PSEG's process for control and assessment.

The inspectors walked-down the major components of the gaseous and liquid release systems to observe current system configuration with respect to the description in the UFSAR, ongoing activities, and equipment material condition.

The inspectors observed the routine processing 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 reviewed several radioactive liquid waste release permits, including the projected doses to members of the public.

The inspectors observed the routine processing (including sample collection and analysis) and release of radioactive gaseous effluent to verify 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 several radioactive gaseous effluent release permits, including the projected doses to members of the public.

The inspectors reviewed the records of any abnormal releases or releases made with inoperable effluent radiation monitors. The inspectors 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. For unmonitored releases, the inspectors reviewed PSEG's evaluation of the type and amount of radioactive material that was released and the associated projected doses to members of the public. Additionally, for any areas where spills, leaks, or other unusual occurrences had occurred, the inspectors verified that these areas were properly documented in the site's decommissioning file, per 10 CFR 50.75(g), as required.

The inspectors assessed PSEG's understanding of the location and construction of underground pipes and tanks, and storage pools (spent fuel pool) that contain radioactive contaminated liquids. The inspectors evaluated if PSEG may have potential unmonitored leakage of contaminated fluids to the groundwater as a result of degrading

material conditions or aging of facilities. The inspectors evaluated PSEG's capabilities for detecting spills or leaks and for identifying groundwater radiological contamination both on site and beyond the owner controlled area. The inspectors reviewed PSEG's technical bases for its onsite groundwater monitoring program due to undetected leakage. The inspectors discussed with PSEG its understanding of groundwater flow patterns for the site, and in the event of a spill or leak of radioactive material, if PSEG's staff can estimate the pathway of a plume of contaminated fluid both on site and beyond the owner controlled area.

The inspectors reviewed changes made by PSEG to the ODCM as well as to the liquid or gaseous radioactive waste system design, procedures, and 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 affect PSEG's ability to maintain effluents ALARA and whether changes made to monitoring instrumentation resulted in a non-representative monitoring of effluents. For significant changes (factor of 5) to dose values reported in the radiological effluent release report from the previous report, the inspectors evaluated the factors that may have resulted in the change. If the change was not influenced by an operational issue, the inspectors reviewed the verification and validation records for PSEG's dose calculation.

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 TS/ODCM values were exceeded and, if appropriate, issued a PI report if any quarterly values were exceeded. The inspectors evaluated the source term used by PSEG to ensure all applicable radionuclides discharged, within detectability standards, were included.

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

The inspectors reviewed records of instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device. The inspectors reviewed any completed system modifications and the current effluent radiation monitor alarm set point value for agreement with RETS/ODCM requirements.

The inspectors reviewed calibration records of radiation measurement instrumentation 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 to verify the quality of radioactive effluent sample analyses performed by PSEG. The inspectors reviewed PSEG's quality control evaluation of the interlaboratory comparison test and associated corrective actions for any deficiencies identified.

The inspectors reviewed the results from PSEG's quality assurance audits to determine whether PSEG met the requirements of the RETS/ODCM.

The inspectors reviewed PSEG's self assessments, audits, Licensee Event Reports, and Special Reports related to the radioactive effluent treatment and monitoring program since the last inspection. The inspectors determined if identified problems were entered into the corrective action program for resolution.

The inspectors reviewed corrective action reports related to the radioactive effluent treatment and monitoring program. The inspectors interviewed staff and review documents to determine if follow-up activities conducted in an effective and timely manner commensurate with their importance to safety and risk, including: initial problem identification, characterization, and tracking; disposition of operability/reportability issues; evaluation of safety significance/risk and priority for resolution; identification of repetitive problems; identification of contributing causes; identification and implementation of effective corrective actions; resolution of non-cited violations tracked in the corrective action system; and, implementation/consideration of risk significant operational experience feedback.

For repetitive deficiencies or significant individual deficiencies in problem identification and resolution issues identified above, the inspectors verified that PSEG's self-assessment activities were also identifying and addressing these deficiencies.

The inspectors evaluated PSEG's performance against the requirements contained in: Technical Specifications 6.8.1(h), 6.8.1(i), 6.8.4.g, 6.9.1.8, 6.10.2.d, 6.10.2.p, 6.14, and 6.15; and 10 CFR 50.36a and 10 CFR 50, Appendix B, section IV.B.1.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151 - 6 samples)

a. Inspection Scope

The inspectors reviewed PSEG submittals for the Unit 1 and Unit 2 Mitigating Systems cornerstone performance indicators (PIs) and the Unit 1 and Unit 2 Barrier Integrity cornerstone PIs discussed below. For these PIs, the inspectors verified the data for the four calendar quarters of 2007. To verify the accuracy of the PI data reported during this period the data was compared to the PI definition and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 5.

Cornerstone: Mitigating Systems

- Unit 1 and 2 Safety System Functional Failures.

Cornerstone: Barrier Integrity

- Unit 1 and 2 Reactor Coolant System (RCS) Unidentified Leak Rate (UILR); and
- Unit 1 and 2 RCS Specific Activity.

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

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 - 1 sample)

.1 Review of Items Entered into the Corrective Action Program:

As specified 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 NOTF and attending daily management review committee meetings. Documents reviewed are listed in the Attachment.

.2 Annual Sample: Flooding Unresolved Item

a. Inspection Scope

In March 2007, the inspectors identified several potential vulnerabilities to internal flooding. The inspectors treated these issues as an unresolved item (URI) pending completion of a technical evaluation by PSEG. NRC Inspection Report 05000272, 05000311/2007002 Section 1R06 documented the initial URI and NRC Inspection Report 05000272, 05000311/2007005 Section 1R06 provided a status update. During the week of March 3, 2008, inspectors independently assessed PSEG's technical evaluation of five original issues relative to PSEG's design and licensing bases for internal flooding at Salem Units 1 and 2. Specifically, the inspectors evaluated whether PSEG adequately implemented measures or provided adequate evaluation of existing plant design to ensure or demonstrate that the capability of safety-related equipment would not be affected by internal flooding from non-safety-related and non-seismic-qualified water sources. The inspectors also walked down the vital switch gear rooms, diesel fuel oil transfer pump rooms, and other safety-related areas in the auxiliary building to assess operational readiness of drains and flood barriers to protect safety-related structures, systems, or components from internal flooding.

b. Findings

Based on plant walkdowns, interviews with design and system engineers, and documentation review, the inspectors concluded that three of the five original potential internal flood vulnerability issues could be closed. The inspectors concluded that PSEG adequately evaluated: high energy line break events in the auxiliary building 84' corridor; non-seismic piping systems potential impact on safety-related equipment in the auxiliary building; and any potential for fire protection piping water hammer in the diesel fuel oil transfer pump area. However, the URI remains open pending inspector review of additional PSEG corrective actions for two original issues: drain system condition and adequacy evaluation (now captured in PSEG evaluation 70077852, previously 70066205-380) and internal flooding design reconciliation analysis (now captured in PSEG evaluation 70068045, previously 70066205-390). To date, no findings of significance were identified with this URI.

4OA3 Event Followup (71153 - 1 sample)

.1 (Closed) LER 050002722008003-00, Salem Unit 1 Automatic Reactor Trip Due to the Failure of 12 Station Power Transformer Load Tap Changer

On December 28, 2007, Salem Unit 1 experienced an automatic reactor trip due to low reactor coolant system loop flow when the 12 station power transformer (SPT) failed. The loss of the 12 SPT resulted in a loss of power to the 1F and 1G group busses and associated 13 and 14 reactor coolant pumps (RCP) causing a subsequent reactor trip on low reactor coolant system loop flow. PSEG's investigation identified that the cause of the failure was inadequate scope of maintenance procedures performed on 12 SPT load tap changer (LTC) internal components. Insufficient performance monitoring of degrading LTC conditions resulted in the failure of the collector rings and stationary and moving contacts on the LTC. There were no complications associated with the unit trip. The failed components were replaced, the transformer was tested satisfactorily and Unit 1 was returned to service on December 31, 2007. This LER was reviewed by the inspectors, no findings of significance were identified and no violation of NRC requirements occurred. The cause and corrective actions are documented in technical evaluation 70078697. This LER is closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 4, 2008, the inspectors presented the inspection results to Mr. Robert Braun. PSEG acknowledged that none of the information reviewed by the inspectors was proprietary.

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by PSEG and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- TS 6.8.h, "Radiological Environmental Monitoring Program," requires that PSEG participate in an inter-laboratory comparison program to verify the quality of radioactive effluent sampling analysis performed. Contrary to this, since early 2006, PSEG has failed to participate in an inter-laboratory comparison program. This was identified in PSEG's CAP as CR 20350812. This finding is of very low safety significance because while it impaired PSEG's ability to assess dose, there was no dose impact to a member of the public.

- Section 9.1 of the Salem Hope Creek Physical Security Plan states that "the Access Authorization Program implements regulatory requirements utilizing the provisions in NEI 03-01 (Revision 1)." Section 6.5, Item 4, of NEI 03-01 (Revision 1) states, "If the individual has not been covered by a licensee BOP (Behavior Observation Program) and random drug and alcohol testing program from 6 – 30 days following the individuals last period of UAA (Unescorted Access Authorization), the licensee shall subject the individual to random selection for pre-access drug and alcohol testing." Contrary to this requirement, PSEG identified that between August 2007 and January 2008, seven individuals were not covered by a licensee BOP and random drug and alcohol testing program for the 6 to 30 day period following their last UAA. These individuals subsequently had their UAA reinstated without being subjected to random selection for pre-access drug and alcohol testing prior to granting them UAA. This was identified in PSEG's corrective action program in notification 20352044.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

M. Bruecks, Director Security
D. Burgin, Manager Emergency Preparedness
F. Carey, Maintenance Supervisor
J. Carlin, Fire Department Superintendant
S. Crampton, System Engineer
S. Davies, Engineering Response Team
R. DeSanctis, Maintenance Director
R. Fisher, In-processing Supervisor
M. Gwirtz, Director Operations
H. Hanson, Manager Nuclear Oversight
J. Higgins, System Engineer
A. Johnson, Design Engineer
D. Johnson, Program Engineer
D. Kolasinski, System Engineer
S. Mannon, Manager Regulatory Affairs
D. McCollum, Component Maintenance Organization
R. Moore, Electrical Systems Manager
B. Neufeld, Nuclear Technical Supervisor, Chemistry
L. Oberembt, NSSS Systems Manager
R. Olson, Director Maintenance
P. Quick, Salem EP Manager
L. Rajkowski, Senior Design Engineering Manager
R. Settle, Manager Engineering Response
G. Sosson, Site Engineering Director
E. Villar, Licensing Engineer
J. Wood, System Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

050003112008002-01	NCV	25SW24 Failure Caused 25 Service Water Pump Unavailability (Section 1R12)
050003112008002-02	NCV	Salem Unit 2 Loss of All Three Chillers (Section 1R15)

05000272/2008003-00	LER	Salem Unit 1 Automatic Reactor Trip Due to the Failure of 12 Station Power Transformer Load Tap Changer (Section 4OA3)

Discussed

05000272&311/2007002-01	URI	Potential vulnerabilities to internal flooding (Section 4OA2.2)

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

Notifications
20356964 20357508 20352061 20354293

Orders
70079089 70079850 70068848

Other Documents
WC-AA-1, Seasonal Readiness, Revision 7

Section 1R04: Equipment Alignment

Procedures
S2.OP-SO.CVC-0001, Charging, Letdown, and Seal Injection, Revision 31
S2.OP-SO.CVC-0008, Rapid Boration, Revision 4
S2.OP-SO.CVC-0023, CVCS Cross-connect Alignment to Unit 1, Revision 7
S2.OP-AB.CVC-0001, Loss of Charging, Revision 6
S2.OP-PT.SW-0004, Service Water Fouling Monitoring Safety Injection and Charging Pumps, Revision 8

Drawings
205328 205334

Notifications
20350331 20349434 20349306 20348464 20346764 20346029
20338808 20338232 20335877

Orders
80029150 30154949

Other Documents
PSA System Notebook, Chemical and Volume Control System (CVCS), Revision 3

DE-CB.CVC-0037, Configuration Baseline Documentation for Chemical & Volume Control System, Revision 4

Section 1R05: Fire Protection

Procedures

OP-AA-201-009, Control of Transient Combustible Material, Revision 1
SC.FP-SV.FBR-0026(Q), Flood and Fire Barrier Penetration Seal Inspection, Revision 3
SA-AA-501-1027, Hot Work Precautions and Safety Practices, Revision 0
CC-AA-211, Fire Protection Program, Revision 3
OP-AA-201-004, Fire Prevention for Hot Work, Revision 0

Other Documents

FRS-II-424, Salem - Unit 1, Unit 2 - CVCS Hold-up Tank Area, Elevation: 64' - 0", Revision 2
FRS-II-421, Salem - Unit 1, Unit 2 - 4160 V Switchgear Rooms & Battery Rooms, Elevation: 64' - 0", Revision 5
FRS-II-434, Salem- Unit 1, Unit 2- Pre-Fire Plan, Charging Pump, Spray Additive Tank Area, Revision 2

Section 1R06: Flood Protection Measures

Procedures

EAL-9.7.1, Flooding, Revision 3
S1.OP-AB.ZZ-0002(Q), Flooding, Revision 3

Notifications

20287502 20287412 20312851 20273398 20273400 20167048

Other Documents

Salem UFSAR sections 3.6.5.2.4, 3.6.5.10, 3.6.5.12.4
Salem IPE 3.3.8, Internal Flooding

Section 1R11: Licensed Operator Requalification Program

Procedures

OP-SA-106-101-2001, Operating with an Emergency on Opposite Unit, Revision 1
NC.EP-EP.ZZ-0102, Emergency Coordinator Response, Revision 13
S2.OP-AB.STM-0001, Excessive Steam Flow, Revision 9
S2.OP-SO.MS-0002, Steam Dump System Operation, Revision 12
S2.OP-SO.TL-0002, Main Turbine Lube Oil Purification and Transfer System, Revision 14
S2.OP-AB.TL-0001, Loss of Main Turbine Lube Oil, Revision 4
S2.OP-AB.LOAD-0001, Rapid Load Reduction, Revision 15
2-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 26
2-EOP-LOSC-1, Loss of Secondary Coolant, Revision 23
2-EOP-LOCA-1, Loss of Reactor Coolant, Revision 27
2-EOP-TRIP-3, Safety Injection Termination, Revision 25
Salem Event Classification Guide, Revision 71

Notifications
20357422

Section 1R12: Maintenance Effectiveness

Procedures
1-EOP-TRIP-1, Reactor Trip or Safety Injection, Revision 26
1-EOP-TRIP-2, Reactor Trip Response, Revision 24
S1.OP-SO.RCS-0001, Rod Control System Operation, Revision 28
S1.OP-SO.CN-0002, Steam Generator Feed Pump Operation, Revision 21
S1.OP-AR.ZZ-0004, Overhead Annunciators Window D, Revision 21
S1.OP-SO.ANN-0001, Overhead Annunciators Operation, Revision 19
SC.MD-PM.25-0001, Main Generator 25kV Auxiliary Power Transformers Preventive Maintenance, Revision 1
SC.MD-PM.13-0003, Westinghouse 13/4kV Station Power Transformers 11, 12 & 21 Preventive Maintenance, Revision 1
ER-AA-2003, System Performance Monitoring and Analysis, Revision 5
SC.MD-PM.ZZ-0210, Disassembly, Inspection, and Reassembly of BNL Ball Valve Mark # AA-303, BA-154 and AA-319, Revision 9
SC.IC-PM.ZZ-2021, Maintenance of Bettis Actuator (Model CB), Revision 10
S2.OP-SO.SW-0001, Service Water Pump Operation, Revision 23

Notifications

20350143	20329260	20329260	20328645	20329405	20329619
20330305	20350137	20350140	20350143	20350146	20350162
20350164	20350165	20350167	20350168	20350171	20350173
20350245	20350327	20350355	20350522	20350562	20350565
20350272	20351081	20351082	20351083	20351084	20351086
20351087	20351088	20351051	20351102	20351192	20351397
20351459	20353264	20354329	20352126	990327096	20353264
20297270	20289788	20284189	20208106	20355206	

Orders

70071266	70071266	70071445	70073075	60071150	70069803
70062353	70041279	70046216	70078569	30131870	30031629
60074665	70079811	30142021	60074665	70078697	

Other Documents
Post Trip Data report for Unit 1 trip on December 28, 2007
Historical Dissolved Gas Analysis Results for Salem Generating Station Transformers
Maplewood Testing Services, Doble Testing Results for 12 Station Power Transformer dated February 1, 2005; December 29, 2007; and December 30, 2007
VTD 325605, BNL Industries, Inc. Ball Valve Operating and Maintenance Instructions, Revision 2
LR-N08-0044, LER 272/2007-003, Salem Unit 1 Automatic Reactor Trip due to the Failure of 12 Station Power Transformer Load Tap Changer, dated February 25, 2008
12 Station power Transformer Load Tap Changer Failure Root Cause Analysis, February 2008

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
OP-AA-101-112-1002, On-Line Risk Assessment, Revision 2
S1.OP-SO.SF-0002, Spent Fuel Cooling System Operation, Revision 19
S1.OP-SO.SF-0006, Spent Fuel Pool Emergency Fill, Revision 6

Notifications
20354080 20352606 20351256 20353311 20355293 20355256
20355243

Other Documents
SGS Unit 1 PRA Risk Evaluation Form for Work Week 803 (13 to 19 January 2008), Revision 2
SGS Unit 2 PRA Risk Evaluation Form for Work Week 804 (20 to 26 January 2008), Revision 0
SGS Unit 1 PRA Risk Evaluation Form for Work Week 805 (27 January to 2 February 2008), Revision 0
SGS Unit 2 PRA Risk Evaluation Form for Work Week 805 (27 January to 2 February 2008), Revision 0
S-C-SF-MDC-1780, Capability of Salem Spent Fuel Pool Heat Exchangers to Maintain 149°F Pool Temperature, Revision 0
S-C-SF-MEE-1302, Evaluation to Determine the Equilibrium Temperature for the SFP Without Forced Cooling, Revision 0
S-C-SF-MDC-1810, Decay Heat-up Rates and Curves, Revision 7
Salem Inservice Testing Program Basis Data Sheet – Valves, for 23SW92, Revision 8
Engineering White Paper Analysis of Relay & Rack Rooms Temperature Rise given complete loss of Unit 2 Chillers
SO 08-03, Operations Standing Order re: Health of Redundant Equipment Prior to Removing Equipment to Support Scheduled Work

Section 1R15: Operability Evaluations

Procedures
OP-AA-108-115, Operability Determinations, Revision 1
OP-SA-108-115-1001, Operability Assessment and Equipment Control Program, Revision 1
S1.OP-AR.ZZ-0001, Overhead Annunciators Window A, Revision 45
S1.OP-AB.ANN-0001, Loss of Overhead Annunciator System, Revision 22
S1.OP-AR.ZZ-0014, Auxiliary Annunciator – Alarm List, Revision 25
S1.OP-DL.ZZ-0003, Control Room Log – Modes 1-4, Revision 53
S2.OP-SO.CH-0001, Chilled Water System Operation, Revision 26
SW.OP-ST.CH-0004, Chilled Water System – Chillers, Revision 15

Drawings
205334

Notifications
20351409 20355945 20355282 20355285 20353945 20270776
20354764 20354058 20353952 20353945 20351121 20350176
20349012 20353343 20353344 20353311 20353297 20353392

20353384	20353364	20353340	20353339	20353609	20353608
20353501	20353538	20346010	20346826	20357539	

Orders
70080856

Other Documents
DE-CB.DG-0024, Emergency Diesel Generator Design Basis Document, Revision 4
S-C-ANN-ECS-0197, MPR's Critical Digital Review for Salem's Aux Annunciator Systems, Revision 0
SO 08-03, Operations Standing Order re: Health of Redundant Equipment Prior to Removing Equipment to Support Scheduled Work

Section 1R18: Plant Modifications

Notifications
20339338

Orders
60072620 70058607 60072370

Other Documents
Field Change 1EC-3595, Relief Panel Support Frame, Revision 1

Section 1R19: Post-Maintenance Testing

Procedures
MA-AA-716-012, Post Maintenance Testing, Revision 10
NC.MD-AP.ZZ-0050, Maintenance Testing Program Matrix, Revision 10
SH.MD-GP.ZZ-0240, System Pressure Test at Normal Operating Pressure and Temperature, Revision 8
MA-AA-716-008, Foreign Material Exclusion Program, Revision 2
SC.MD-PM.SF-0002, Spent Pool Cooling Heat Exchanger Inspection and Repair, Revision 2
S1.OP-ST.DG-0003, 1C Diesel Generator Surveillance Test, Revision 42
SC.MD-PM.13-0003, Westinghouse 13/4kV Station Power Transformers 11, 12 & 21 Preventive Maintenance, Revision 1
SC.MD-PM.ZZ-0210, Disassembly, Inspection, and Reassembly of BNL Ball Valve Mark # AA-303, BA-154 and AA-319, Revision 9
SC.IC-PM.ZZ-2021, Maintenance of Bettis Actuator (Model CB), Revision 10
S2.OP-SO.SW-0001, Service Water Pump Operation, Revision 23
SC.MD-PM.SW-0003, Service Water Auto Strainer Adjustment, Inspection, Repair and Replacement, Revision 27
SC.MD-PT.230-0001, Thermal Overload Relay Overcurrent Trip Testing, Revision 5
SH.MD-GP.ZZ-0008, Installation and Removal of Motors, Revision 10
SC.MD-PM.SW-0003, Service Water Auto Strainer Adjustment, Inspection, Repair and Replacement, Revision 27
S1.OP-ST.DG-0002, 1B Diesel Generator Surveillance Test, Revision 41

Notifications
20353264 20354329 20352126 990327096

Orders
30097691 60071150 70079811 30142021 60074787 60074019

Other Documents
PSEG Maplewood Testing Services Eddy Current Inspection Results for 1SFE12 under WO 30097691
DCP 1EC-3697, K1C Relay Replacement
Maplewood Testing Services, Doble Testing Results for 12 Station Power Transformer dated December 29 and December 30, 2007
VTD 325605, BNL Industries, Inc. Ball Valve Operating and Maintenance Instructions, Revision 2

Section 1R22: Surveillance Testing

Procedures
S2.OP-ST.RC-0008, Reactor Coolant System Water Inventory Balance, Revision 28
S2.OP-ST.CVC-0003, Inservice Testing – 21 Charging Pump, Revision 19
S2.RA-ST.CVC-0003, Inservice Testing 21 Charging Pump Acceptance Criteria, Revision 11
S1.OP-ST.RC-0007, Seal Injection Flow, Revision 5
S1.OP-ST.500-0001, Electrical Power Systems AC Sources Alignment, Revision 10
S1.OP-ST.CS-0001, Inservice Testing – 11 Containment Spray Pump, Revision 15
SW.OP-ST.SW-0006, 16 SW Pump Surveillance Data, Revision 25
S1.OP-ST.SW-0006, Inservice Testing – 16 Service Water pump, Revision 26
S2.OP-ST.SJ-0001, Inservice Testing – 21 Safety Injection Pump, Revision 17

Notifications
20351343 20353528 20353472 20350882 20350173 20353056
20352287 20352308 20352784 20358208 20358187

Orders
50108798 50110767

Other Documents
WCAP-16465-NP, Pressurized Water Reactor Owners Group Standard RCS Leakage Action Levels and Response Guidelines for Pressurized Water Reactors, Revision 0

Section 1EP6: Drill Evaluation

Other Documents

Salem Generating Station Event Classification Guide
NC.EP-EP.ZZ-0201, TSC – Integrated Engineering Response, Rev. 10

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

Procedures/Calibration Results:

S1.IC-CC.RM-0014(Q), 1R11 Containment Air Particulate Process Radiation Monitor, Revision 10
S1.IC-CC.RM-0016(Q), 1R12 Containment Atmosphere Noble Gas Process Radiation Monitor
S1.IC-CC.RM-0018(Q), Revision 8, 1R13A & 1R13F Containment #11 Fan Coil Unit Process Radiation Monitor, Revision 16
S1.IC-CC.RM-0019(Q), 1R13B & 1R13G Containment #12 Fan Coil Unit Cooling Water Process Radiation Monitor, Revision 11
S1.IC-CC.RM-0020(Q), 1R13C Containment #13 Fan Coil Unit Process Radiation Monitor, Revision 13
S1.IC-CC.RM-0021(Q), 1R13D Containment #14 Fan Coil Unit Process Radiation Monitor, Revision 9
S1.IC-CC.RM-0022(Q), 1R13e Containment #15 Fan Coil Unit Process Radiation Monitor, Revision 14
S1.IC-CC.RM-0028(Q), 1R18 Liquid Waste Disposal Process Radiation Monitor, Revision 11
S1.IC-CC.RM-0029(Q), 1R19A Steam Generator 11 Blowdown Process Radiation Monitor, Revision 15
S1.IC-CC.RM-0030(Q), 1R19B Steam Generator 12 Blowdown Process Radiation Monitor, Revision 20
S1.IC-CC.RM-0031(Q), 1R19C Steam Generator 13 Blowdown Process Radiation Monitor, Revision 15
S1.IC-CC.RM-0032(Q), 1R19D Steam Generator 14 Blowdown Process Radiation Monitor, Revision 17
S1.IC-CC.RM-0064(Q), 1R41A Low Range/1R41D Composite Plant Vent Noble Gas Process Radiation Monitor, Revision 17
S1.IC-CC.RM-0065(Q), 1R41B Intermediate Range Noble Gas Process Radiation Monitor, Revision 16
S1.IC-CC.RM-0066(Q), 1R41C Plant Vent High Range Noble Gas Process Radiation Monitor, Revision 13
S1.IC-CC.RM-0074(Q), R45A Plant Vent Noble Gas Background Radiation Monitor, Revision 1
S1.IC-CC.RM-0075(Q), R45B Plant Vent Noble Gas Intermediate Range Process Radiation Monitor, Revision 16
S1.IC-CC.RM-0076(Q), R45C Plant Vent Noble Gas High Range Process Radiation Monitor, Revision 16
S1.IC-CC.RM-0077(Q), R45D Plant Vent Particulate Process Radiation Monitor, Revision 2
S1.IC-CC.RM-0088(Q), 1R41 Plant Vent Noble Gas Sample and Process Flow Calibration, Revision 10
S1.IC-FT.RM-0014(Q), 1R11A Containment Air Process Radiation Monitor, Revision 15
S1.IC-FT.RM-0016(Q), 1R12A Containment Atmosphere Noble Gas Process Radiation Monitor, Revision 20
S1.IC-FT.RM-0018(Q), 1R13A & 1R13F #11 Containment Fan Coil Unit Cooling Water Process Radiation Monitor, Revision 7
S1.IC-FT.RM-0019(Q), 1R13B & 1R13G Containment #12 Fan Coil Unit Cooling Water Process Radiation Monitor, Revision 8

S1.IC-FT.RM-0020(Q), 1R13C Containment #13 Fan Coil Unit Process Radiation Monitor, Revision 9
S1.IC-FT.RM-0021(Q), 1R13D #14 Containment Fan Coil Unit Cooling Water Process Radiation Monitor, Revision 8
S1.IC-FT.RM-0022(Q), 1R13E Containment #15 Fan Coil Unit Process Radiation Monitor, Revision 9
S1.IC-FT.RM-0028(Q), 1R18 Liquid Waste Disposal Process Radiation Monitor, Revision 11
S1.IC-FT.RM-0129(Q), 1R19A-D Steam Generator Blowdown Process Radiation Monitor, Revision 3
S1.IC-FT.RM-0067(Q), 1R41D Plant Vent Noble Gas Release Rate Process Radiation Monitor, Revision 17
S1.IC-FT.RM-0077(Q), R45 Plant Vent Noble Gas Intermediate/High Range Process Radiation Monitor, Revision 23
S1.IC-LC.GBD-0001(Q), Steam Generator Blowdown Flow Instrument Loop Calibration, Revision 15
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S2.IC-CC.RM-0088(Q), 2R41 Plant Vent Noble Gas and Process Flow Calibration, Revision 12

S2.IC-FT.RM-0014(Q), 2R11A Containment Atmosphere Particulate and Process Radiation Monitors, Revision 11
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S2.IC-FT.RM-0077(Q), R35 Plant Vent Noble Gas Intermediate/High Range Process Radiation Monitor, Revision 23
S2.IC-LC.GBD-0001(Q), Steam Generator Blowdown Flow Instrument Loop Calibration, Revision 14
SC.MD-GP.ZZ-0016(Q), Configuration Control for Maintenance Activities, Revision 1
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S2.IC-CC.RM-0016(Q), 2R12A Containment Atmosphere Noble Gas Process Radiation Monitor, Revision 13
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S2.IC-CC.RM-0031(Q), 2R19C Steam Generator 23 Blowdown Process Radiation Monitor, Revision 14
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S2.IC-FT.RM-0018(Q), 2R13A #21 Fan Coil Unit Process Radiation Monitor, Revision 9
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S2.IC-FT.RM-0060(Q), R37 Chemical Waste Basin Process Radiation Monitor, Revision 6
S2.IC-FT.RM-0077(Q), R35 Plant Vent Noble Gas Intermediate/High Range Process Radiation Monitor, Revision 23
S2.IC-LC.GBD-0001(Q), Steam Generator Blowdown Flow Instrument Loop Calibration, Revision 14
SC.MD-GP.ZZ-0016(Q), Configuration Control for Maintenance Activities, Revision 1

Other Documents

Offsite Dose Calculation Manual for PSEG Nuclear LLC Salem Generating Station, Revision 20
2006 Annual Radioactive Effluent Release Report for the Salem and Hope Creek Generating Stations
2006 Annual Radiological Environmental Operating Report, January 1 to December 31, 2006, Appendix F, “Radiological Groundwater Protection Program”
Liquid Radioactive Waste Release Permits: 50842.143.156.L; 50840.242.158.L
Gaseous Radioactive Waste Release Permits: 54105.151.167.G; 54106.251.175.G
Check-in Self-assessment of RETS compliance with Reg. Guide 4.15
NUCON international Radioiodine Test Reports:
- Unit 1 Control Area Ventilation
- Unit 2 Control Area Ventilation
- Unit 1 Auxiliary Building Ventilation
- Unit 2 Auxiliary Building Ventilation
- Unit 1 Fuel Handling Ventilation
- Unit 2 Fuel Handling Ventilation

Section 4OA1: Performance Indicator Verification

RCS Specific Activity PI Data 1Q07, 2Q07, 3Q07, 4Q07
Safety System Functional Failures PI Data 1Q07, 2Q07, 3Q07, 4Q07

Reactor Coolant System (RCS) Unidentified Leak Rate (UILR) PI Data 1Q07, 2Q07, 3Q07, 4Q07

Section 4OA2: Identification and Resolution of Problems

Notifications
20231837, 20312851, 20318368, 20340767, 20345526, 20358186, 20361789, 20352044, 20354666

Evaluations
70046310, 70066205, 70068045, 70077852

Calculations
S-C-FP-MEE-1894, Salem Unit 1& 2 Fire Protection Piping Evaluation for Consequences of Potential Water Hammer, Rev. 0

Procedures
SY-AA-103-500, Access Authorization Program, Revision 9
SY-AA-103-514, Fabrication of Security Badges, Revision 14
SY-AA-103-511, Request for Unescorted Access, Revision 19
SY-AA-103-501, Access Authorization Categories and Requirements, Revision 8

Orders
80094711

Other Documents
NEI 03-01, Nuclear Power Plant Access Authorization Program, Revision 1
Audit NOSA-HPC-08-01, Hope Creek Security Plan, FFD and PADS Audit Report dated January 18, 2008
DE-PS.ZZ-0001-A6-GEN, Salem Fire Protection Report, Rev. 0

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
APT	Auxiliary Power Transformer
CA	Control air
CFCU	Containment Fan Coil Unit
CFR	Code of Federal Regulations
CS	Containment Spray
CVCS	Chemical and Volume Control System
DFOST	Diesel fuel oil storage tank
DFOTP	Diesel Fuel Oil Transfer Pump
ECAC	Emergency Control Air Compressor
EDG	Emergency Diesel Generator
EOOS	Equipment Out of Service
I&C	Instrumentation and Controls
IMC	Inspection Manual Chapter
IST	In-service Testing
LTC	Load Tap Changer
MM	Mechanical Maintenance
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NOTF	Notification
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PADS	Personnel Access Data System
PARS	Publicly Available Records
PI	Performance Indicator
PSEG	Public Service Enterprise Group Nuclear LLC
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specifications
RHR	Residual heat removal
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SJ	Safety Injection
SPAR	Standardized Plant Analysis Risk
SPT	Station Power Transformer
SRA	Senior Reactor Analyst
SSCs	Structures, systems, and components
SW	Service Water
SWP	Service Water Pump
SWS	Service Water Strainer
UAA	Unescorted Access Authorization
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved item
WNP-2	Washington Nuclear Project Unit 2
WO	Work Order