January 25, 2002

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

SUBJECT: SALEM NUCLEAR GENERATING STATION - NRC INSPECTION REPORT 50-272/01-11, 50-311/01-11

Dear Mr. Keiser:

On December 29, 2001, the NRC completed an inspection of your Salem 1 & 2 reactor facilities. The enclosed report documents the inspection findings which were discussed on January 9, 2001, with Mr. Dave Garchow 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.

No findings of significance were identified.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design basis threat (DBT). From these audits, the NRC has concluded that your security program is adequate at this time.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Glenn W. Meyer, Chief
Projects Branch 3
Division of Reactor Projects

Enclosure: Inspection Report 50-272/01-11, 50-311/01-11
Attachment: Supplemental Information

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

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos:	50-272, 50-311
License Nos:	DPR-70, DPR-75
Report No:	50-272/01-11, 50-311/01-11
Licensee:	PSEG Nuclear LLC
Facility:	Salem Nuclear Generating Station, Units 1 & 2
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Dates:	November 11 - December 29, 2001
Inspectors:	Raymond K. Lorson, Senior Resident Inspector Fred L. Bower, Resident Inspector Richard S. Barkley, Senior Project Engineer Jason C. Jang, Senior Health Physicist Joseph T. Furia, Senior Health Physicist Nancy T. McNamara, Emergency Preparedness Specialist Keith A. Young, Reactor Inspector John G. Caruso, Senior Operations Engineer
Approved By:	Glenn W. Meyer, Chief Projects Branch 3 Division of Reactor Projects

Summary of Findings

IR 05000272-01-11, IR 05000311-01-11, on 11/11 - 12/29/01, Public Service Electric Gas Nuclear LLC, Salem Units 1 and 2. Resident Inspector report.

The inspection was performed by resident and region-based inspectors. The inspection identified no findings of significance. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Violations

Violations of very low significance which were identified by PSEG Nuclear have been reviewed by the inspectors. Corrective actions, taken or planned by PSEG Nuclear, appeared reasonable and appropriate. These violations are listed in section 40A7 of this report.

TABLE OF CONTENTS

Report Details

SUMMARY OF PLANT STATUS

Unit 1 began the period at approximately 82 percent power to support maintenance on an offsite power line and the secondary plant. The operators subsequently adjusted the reactor power levels in support of multiple maintenance activities before returning the plant to full power on November 17. Operators reduced Unit 1 power to approximately 78 percent on November 24 in response to a solar magnetic disturbance (SMD). The unit was subsequently restored to and remained at essentially full power for the duration of the period.

Unit 2 began the period at full power. Operators reduced Unit 2 power to approximately 78 percent on November 24 in response to an SMD. The unit was subsequently restored to and remained at essentially full power for the duration of the period.

1. REACTOR SAFETY

Initiating Events, Mitigating Systems, and Barrier Integrity [Reactor - R]

R01 Adverse Weather Protection

a. Inspection Scope

On November 30 PSEG Nuclear identified water percolating up through the ground that created a sinkhole adjacent to the service water (SW) intake structure and above the 12 SW header. PSEG Nuclear performed testing and determined that the 12 SW header was leaking. The leak had begun to saturate the adjacent soil. PSEG Nuclear inserted a vertical drain pipe in the ground above the leak to create a well and directed the leakage to a nearby storm drain through the use of a pump and flexible hose.

PSEG Nuclear installed a shed over the well pipe and pump to protect the area from adverse environmental conditions. The inspectors reviewed the installation and observed that the shed was secured against wind loading through the use of concrete blocks. The inspectors noted that heating elements were not installed to protect the area from a low temperature condition. Additionally, security lighting was not installed inside the shed. The inspectors discussed these concerns with PSEG Nuclear security and operations management, and heating and lighting elements were subsequently installed.

b. Findings

No findings of significance were identified.

R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

On December 12, the inspectors performed an equipment alignment partial walkdown to evaluate the operability of the 11 SW header, while PSEG Nuclear considered the 12 SW header in a degraded but operable condition (Section 1R13 provides additional information). The walkdown included a review of system drawings to determine the correct system lineup and observation of critical components to identify any discrepancies that could affect operability of the redundant train or backup system. Minor discrepancies were identified to PSEG Nuclear personnel.

b. Findings

No findings of significance were identified.

R05 Fire Protection

a. Inspection Scope

The inspectors toured the following risk-significant plant areas to assess PSEG Nuclear's control of combustible materials and ignition sources, the material condition of fire detection and suppression equipment, and the operational status of fire barriers. They verified on a sampling basis that fire impairments were documented and that adequate compensatory measures were in place. The following areas were reviewed:

- 13 and 23 Auxiliary Feedwater Pump Rooms
- #3 Service Water Bay Room

b. Findings

No findings of significance were identified.

R11 Licensed Operator Requalification

.1 Licensed Operator Requalification Training

a. Inspection Scope

The inspectors reviewed a December 2001, crew simulator training exercise that involved multiple events, including an anticipated transient without scram and a steam generator tube rupture. The inspector reviewed the training scenario, observed the crew's response and and attended the post-drill critique.

b. Findings

No findings of significance were identified.

.2 Requalification Exam Review

a. Inspection Scope

A in-office review was performed of operator requalification exam results for the biennial testing cycle. The inspection assessed whether pass rates were consistent with the guidance of NUREG-1021, Revision 8, "Operator Licensing Examination Standards for Power Reactors" and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)".

The inspector verified that:

- Crew pass rate was greater than 80%. (Pass rate was 100%)
- Individual pass rate on the written exam was greater than 80%. (Not applicable - not administered in 2001)
- Individual pass rate on the walk-through (job performance measures) was greater than 80%. (Pass rate was 100%)
- More than 75% of the individuals passed all portions of the exam. (100% of the individuals passed all portions of the exam)

b. Findings

No findings of significance were identified.

R12 Maintenance Rule Implementation

.1 Units 1 and 2 Chemical and Volume Control System

a. Inspection Scope

The inspectors reviewed the Unit 1 and Unit 2 chemical and volume control (CVC) systems to assess the effectiveness and implementation of the maintenance rule program. The reviews focused on: (1) proper maintenance rule scoping, in accordance with 10 CFR 50.65; (2) safety significance classifications; (3) 10 CFR 50.6 (a)(1) and (a)(2) classifications; and, (4) recent performance trends. The inspectors reviewed the most the two most recent CVC system health reports for each unit. The review included the Unit 1 report that covered the period of April 1 to June 30, 2001 and the Unit 2 report that covered the period of January 1 to March 31, 2001. The inspector also reviewed the Units 1 and 2 CVC system health reports for the period of July 1 to August 31, 2001. The inspectors verified that the CVC system is a high risk significant and safety-related system that is in the scope of the maintenance rule. The inspectors also confirmed that both the Unit 1 and Unit 2 CVC systems were in (a)(1) status as a result of exceeding the unavailability hours performance criteria for correcting biofouling of the charging pump lube oil and gear oil heat exchangers. The inspectors also reviewed the (a)(1) evaluations [CR990521170, and orders 70015164 and 70017761].

b. Findings

No findings of significance were identified.

.2 Units 1 and 2 Containment Building Ventilation System

a. Inspection Scope

The inspectors reviewed the Unit 1 and Unit 2 containment building ventilation (CBV) systems to assess the effectiveness and implementation of the maintenance rule program. The reviews focused on: (1) proper maintenance rule scoping, in accordance with 10 CFR 50.65; (2) safety significance classifications; (3) 10 CFR 50.6 (a)(1) and (a)(2) classifications; and, (4) recent performance trends. The inspectors reviewed the two most recent Units 1 and 2 CBV system health reports. The first covered the period of January 1 to June 30, 2001. The inspector also reviewed the Units 1 and 2 CBV system health reports for the period of July 1 to September 30, 2001. The inspectors verified that the CBV system is a safety-related system with high risk significant functions. The CBV system is in the scope of the maintenance rule. The inspectors also confirmed that both the Unit 1 and Unit 2 CBV systems were in (a)(1) status due to exceeding the unavailability hours and/or reliability performance criteria. Containment fan coil unit (CFCU) electrical breaker and service water valve problems have been the major contributors to exceeding the performance criteria. The inspectors noted that (a)(1) corrective action plans have been placed on hold while engineering personnel evaluate alternative corrective actions and study the feasibility of providing a closed loop cooling system for the containment fan coolers. The inspectors also reviewed the (a)(1) evaluations (Order 70001085) and Action Plan S-01-001.

b. Findings

No findings of significance were identified.

.3 Common (Units 1 and 2) 500 kV AC System and Main/Auxiliary Transformers

a. Inspection Scope

The inspectors reviewed the 500 kV AC System and Main/Auxiliary Transformers (500kV) systems, common to Salem Units 1 and 2, to assess the effectiveness and implementation of the maintenance rule program. The reviews focused on: (1) proper maintenance rule scoping, in accordance with 10 CFR 50.65; (2) safety significance classifications; (3) 10 CFR 50.6 (a)(1) and (a)(2) classifications; and, (4) recent performance trends. The inspectors reviewed the two most recent 500kV system health reports. The first covered the period of April 1 to June 30, 2001. The inspector also reviewed the 500kV system health reports for the period of July 1 to September 30, 2001. The inspectors verified that the 500kV system is a safety-related system with high risk significant functions. The 500kV system is in the scope of the maintenance rule. The inspectors noted that the 500kV systems had exceeded the reliability performance criteria and were expected to be placed in an (a)(1) goal monitoring status for a repeat preventable system functional failure of gap-type lightning arresters due to an internal short. The inspectors also reviewed open Orders 70018322

and 70019935 that were initiated to evaluate these failures and determine corrective actions.

b. Findings

No findings of significance were identified.

R13 Maintenance Risk Assessments and Emergent Work Control

.1 Maintenance Risk Assessments

a. Inspection Scope

For the maintenance activities listed below, the inspectors observed selected work activities and/or reviewed work plans to verify that: risk assessments were performed in accordance with SH.OP-AP.ZZ-0027(Q), "On-Line Risk Assessment"; risk assessment reviews for unscheduled availability were entered into the control room narrative logs; the risk associated with scheduled work activities was properly managed; and appropriate contingency plans were identified in the integrated work schedule.

- Planned maintenance outage to replace cell number 35 in the 125-volt direct current (DC) bus 2A battery (Order 60022523) within a two hour outage time allowed per Technical Specification (TS) 3.8.2.3.a on December 13.

- Planned maintenance outage on the 12 residual heat removal pump (RHR) on December 17 and 18 to perform instrument calibrations, valve testing and maintenance, in-service testing, and component inspections.

b. Findings

No findings of significance were identified.

.2 Emergent Work Control

a. Inspection Scope

On November 30 PSEG Nuclear identified water percolating up through the ground and creating a sinkhole adjacent to the SW intake structure and above the 12 SW header. PSEG Nuclear determined that the 12 SW header was leaking. Order 60024361 was initiated to develop repair plans, contingency plans and schedules to repair the leak. The inspectors observed selected planning and scheduling meetings, and reviewed selected portions of Order 60024361 to ensure that risk and safety were appropriately considered. Additionally, the inspectors reviewed the activities implemented to minimize the plant risk while the 12 SW header was removed from service for repair.

On December 26 PSEG Nuclear identified an approximately 1 gpm service water leak from the drain line of the 12 chiller condenser. At the time that the leak was discovered, the 13 chiller was out of service for a planned maintenance outage. The inspectors performed a field walkdown to assess the operational impact of the leakage and also

reviewed PSEG Nuclear's initial actions, which included: entry into TS 3.7.10.b for having two inoperable chillers, installation of a housekeeping patch over the degraded section of piping and development of operability determination (OD) 01-011 that performed a qualitative assessment of the pipe integrity. PSEG Nuclear subsequently determined that the 12 chiller remained operable with the pipe leak and exited TS 3.7.10.b.

b. Findings

No findings of significance were identified.

R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed OD 01-011 that reviewed the operability of the 12 chiller subsequent to the identification of a through wall service water pipe leak (discussed in Section R13). The OD performed a qualitative assessment that attributed the leak to a localized corrosion mechanism and determined that the pipe integrity was not compromised by the leak.

b. Findings

No findings of significance were identified.

R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed procedure SH.OP-AP.ZZ-0030(Q), "Operator Burden Program", governing the process of identifying, tracking and managing plant deficiencies that constitute operator burdens. These burdens include control room indicators, computer points, overhead annunciators, operator workarounds and operator concerns. The inspectors reviewed status and tracking records for operator burdens covering February to November 2001 as well as reviewed the open notifications for each of the operator burdens, particularly operator workarounds, open as of October 26, 2001. The majority of the open operator burdens consisted of operator concerns, which are equipment deficiencies that the operations department feels have not been corrected through normal corrective action programs and need to be identified and tracked under this program. The February and August 2001 assessments of the cumulative impact of the operator workarounds were also reviewed. The inspectors interviewed an instrument and controls supervisor, Work it Now Team Senior Reactor Operator (SRO) and a system engineer to determine what efforts were ongoing to improve equipment reliability such that the operator burden backlog reduction that occurred in the first three quarters of 2001 can be sustained in the future.

b. Findings

No findings of significance were identified.

R17 Permanent Plant Modifications

.1 22 CFCU Discharge Flow Transmitter

a. Inspection Scope

In August 2000 the Unit 2 CFCUs experienced several failures that resulted in an unplanned entry into a 7-day TS action statement (Notification 20038104). PSEG Nuclear performed a root cause analysis (Order 70009562). One contributing cause was the potential for air entrapment in sensing lines to flow control instruments. The associated corrective action included the development of design changes to improve the flow controls and sensing lines. The inspectors reviewed Engineering Change 80028593, "Relocate Taps for 22 CFCU Discharge Flow Transmitter," and selected portions of procedure NC.CC-AP.ZZ-0080(Q), "Engineering Change Process." The inspectors also discussed the modification with the responsible engineering supervisor.

The objective of the reviews were to verify that: (1) the design bases, licensing bases, and performance capability of risk significant structures, systems or components would not be degraded through the modification; (2) the configuration of the plant would be controlled to manage the risk-significance of the modification; and, (3) the modification would not place the plant in an unsafe condition.

The inspectors reviewed the work week package, and the weekly risk evaluation associated with the week of December 17, the scheduled installation of the modification. The inspectors also walked down the location of the proposed modification. After discussion with work coordination personnel, the inspectors noted that the installation of the modification was not installed and was postponed since some of the required parts were not available.

b. Findings

No findings of significance were identified.

R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the test plan and observed selected portions of the post-maintenance pressure testing for the repair of the 12 SW header leak (discussed in R13).

b. Findings

No findings of significance were identified.

R22 Surveillance Testing

a. Inspection Scope

The inspectors observed the performance of surveillance test procedures or reviewed test data of selected risk-significant systems, structures, and components (SSCs) to assess whether the SSCs satisfied TS, Updated Final Safety Analysis Report, and procedure requirements. The inspectors assessed whether the testing appropriately demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions. The following tests were reviewed:

- Monthly surveillance testing of the Unit 2 waste gas analyzer in accordance with S2.IC-FT.WG-0001(Q) (Order 50044528).
- In-service testing of component cooling valves in accordance with S2.OP-ST.CC-0004(Q).

The inspectors also reviewed PSEG Nuclear's response to an apparent stroke time test failure of CFCU service water valve 24SW58 per S2.OP-ST.SW-0010(Q). Following completion of subsequent review and testing, PSEG Nuclear attributed the apparent test failure to a data recording error and not to the actual valve performance.

b. Findings

A PSEG Nuclear-identified finding for a missed surveillance for the Unit 2 waste gas analyzer was reviewed and is discussed in Section OA7. No additional findings of significance were identified.

R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed temporary modifications that were installed during the period to assess: (1) the adequacy of the 10 CFR 50.59 evaluation; (2) that the installations were consistent with the modification documentation; (3) that the drawings and procedures were updated as applicable; and, (4) the adequacy of post-installation testing. The following temporary modifications were reviewed:

- Continuous backwash for the 16 service water pump strainer (01-039)
- Continuous backwash for the 12 service water pump strainer (01-042)
- Blind Flange for 14SW5 and 1-SW-P-6905 Spool Removal (01-043)

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness [EP]

EP2 Alert and Notification System (ANS)

a. Inspection Scope

An onsite review of PSEG Nuclear's ANS was performed to ensure prompt notification to the public to take protective actions. The inspector reviewed: (1) PSEG Nuclear's design basis document submitted to the Federal Emergency Management Agency in 1986; (2) siren testing data; and (3) maintenance records for correcting siren failures. In addition, the inspector interviewed the ANS program manager and reviewed the following procedures: (1) "NRD Productions, Alert and Notification System Daily Operational Guidelines"; (2) NC.EP-DG.ZZ-0001(Z), "Maintenance of EP Performance Indicator Data," Rev. 01; and (3) ND-EP-AP-ZZ-0002(Q), "Alert Notification System," Rev. 01. The review was performed in accordance with NRC Inspection Procedure 71114, Attachment 02, and the applicable planning standard, 10 CFR 50.47(b)(5) and the related 10 CFR 50, Appendix E requirements were used as reference criteria.

Order (80038006) was reviewed that was generated and entered into the corrective action program to address inspector observations during the ANS portion of this inspection.

b. Findings

No findings of significance were identified.

EP3 Emergency Response Organization (ERO) Augmentation

a. Inspection Scope

The inspector performed an onsite review of PSEG Nuclear's ERO augmentation staffing requirements and the process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The inspector reviewed the Emergency Plan qualification records for key ERO positions, monthly communication pager test records, associated trending charts and 13 Notifications regarding ERO qualification lapses. Also, two unannounced off-hours augmentation call-in drill reports (2001) were reviewed to determine if PSEG Nuclear identified ERO augmentation deficiencies. The inspector reviewed Emergency Plan Administrative Procedure, No. 1014, "Training Program"; (2) NC.EP-DG.ZZ-0005(Z), "ERO Callout Tests," Rev. 0; (3) EPIP 204S/H, Emergency Response/Personnel Callout," Rev. 50;

and (4) Self-Assessment NEP-PER-01-003A, "Performance Based Training," dated 8/01. The review was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, and the applicable planning standard, 10 CFR 50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

Three notifications were reviewed that were generated and entered into the corrective action program to address concerns regarding ERO qualification lapses and are identified in the supplemental information attached to this report.

b. Findings

No findings of significance were identified.

EP4 Emergency Action Level (EAL) Revision Review

a. Inspection Scope

A regional in-office review of revisions to the Emergency Plan, implementing procedures and EAL changes was performed to determine that changes did not decrease the effectiveness of the plan. The revisions covered the period from July through December 2001. Onsite, the inspector reviewed the associated 10 CFR 50.54(q) reviews and Procedure No. NC.EP-AP.ZZ-1003(Q), "10 CFR 50.54(q) Effectiveness Review Guide," Rev. 0. The review was performed in accordance with NRC Inspection Procedure 71114, Attachment 04, and the applicable requirements in 10 CFR 50.54(q) were used as reference criteria.

Two notifications were reviewed that were generated and entered into the corrective action program to address inspector observations, and are identified in the supplemental information attached to this report.

b. Findings

No findings of significance were identified.

EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector reviewed corrective actions identified by PSEG Nuclear pertaining to findings from drill/exercise reports for 2000 and 2001, self-assessment reports for 2001 and from problems resulting from surveillances and actual events. Notifications assigned to the EP Department were also reviewed to determine the significance of the issues and to determine if repeat problems were occurring. In addition, the inspector reviewed the 2001 quarterly Quality Assessment audit reports and the associated audit checklists to determine if PSEG Nuclear had met the 10 CFR 50.54(t) requirements and if any repeat issues were identified. This review was performed according to NRC Inspection Procedure 71114, Attachment 05, and the applicable planning standard, 10CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Public Radiation Safety [PS]

PS1 Gaseous and Liquid Effluent

a. Inspection Scope

The inspector reviewed the following documents to evaluate the effectiveness of PSEG Nuclear's radioactive gaseous and liquid effluent control programs. The requirements of the radioactive effluent controls were specified in PSEG Nuclear's Technical Specifications/Offsite Dose Calculation Manual (TS/ODCM).

- 2000 Radiological Annual Effluent Release Reports including projected public dose assessments;
- Most recent Offsite Dose Calculation Manual (ODCM, Revision 14, December 13, 2000) and technical justifications for ODCM changes;
- PSEG Nuclear's response to LRN-00-0146, Supplemental Information for Radioactive effluent Technical Specification Change Request, Salem Generating Station Unit Nos. 1 and 2 dated May 31, 2000;
- Selected 2001analytical results for radioactive liquid, charcoal cartridge, particulate filter, and noble gas samples;
- Selected 2001 radioactive liquid and gaseous release permits;
- Implementation of the compensatory sampling and analysis program when the effluent radiation monitoring system (RMS) is out of service;
- Unit 1 Special Report 00-001 (LRN-00-0326), "Radiation Monitoring System Channel 1R46A through E (Main Steamline Discharge) were inoperable greater than seven (7) days," August 21, 2000;
- Unit 2 Special Report 01-005 (LRN-01-0303), "RMS 2R15 was inoperable greater than seven (7) days," September 19, 2001;
- Unavailability tracking for radioactive liquid and gaseous effluent monitors;
- Notifications 20057418, 20051215, 20067998, 20068000, 20045098, 20066982, 20045416, 20064873, and 20052120;
- Calibration records for chemistry laboratory measurements equipment (gamma and liquid scintillation counters);
- Implementation of the measurement laboratory quality control program, including control charts;
- Implementation of the interlaboratory comparisons by PSEG Nuclear and the contractor laboratory;
- 1999 and 2001QA Audits and corrective actions (Audit Numbers 2001-0204, Radiological Effluent Monitoring Instrumentation, Audit Number 2001-0325, Effluent Control, and Audit Number 99-0195, REMP/RETS Instrumentation and Effluent Control);

- Most recent Channel Calibration and Channel Functional Test results for the radioactive liquid and gaseous effluent RMS and its flow measurement devices listed in the ODCM Tables 4.3-12 and 4.3-13, including:

  RMS (Units 1 and 2)

  - Liquid Radwaste Effluent Line Monitors (1R18 and 2R18);
  - Steam Generator Blowdown Line Monitors (1R19A-D and 2R19A-D);
  - Containment Fan Coolers-Service Water Line Discharge Monitors (1R13A-E and 2R13A-C);
  - Chemical Waste Basin Monitor, Common for both units (R37);
  - Waste Gas Holdup System Noble Gas Monitors (1R41 A&D and 2R41 A&D);
  - Containment Purge and Pressure-Vacuum Relief Noble Gas Monitors (1R12A, 1R41A&D, 2R12A, and 2R41A&D);
  - Plant Vent Noble Gas Monitors (1R16, 1R41A&D, 2R16, and 2R41A&D); and
  - Plant Vent Intermediate and High Range Noble Gas Monitors (1R41B, 1R41C, 2R41B and 2R41C).

  Flow Rate Measuring Device (Units 1 and 2)

  - Liquid Radwaste Effluent Line (1FR1064 and 2FR1064);
  - Steam Generator Blowdown Effluent Line (1FA-3178,-3180, -3182, and 3184: 2FA-3178, -3180, -3182, and -3184);
  - Plant Vent Flow Rate Monitors (1RM-1FA8603 and 2RM-2FA17079)

- Most recent surveillance testing results (visual inspection, delta P, in-place testings for HEPA and charcoal filters, air capacity test, and the laboratory test for iodine collection efficiency) for the following air treatment systems for Units 1 and 2:

  - TS 3/4.7.6 Control Room Emergency Filtration Systems;
  - TS 3/4.7.7 Auxiliary Building Exhaust Air Filtration Systems; and
  - TS 3/4.9.12 Fuel Handling Area Ventilation Systems;

- Review of the Response Letter to the NRC Generic Letter 99-02, “Laboratory Testing of Nuclear-Grade Activated Charcoal.”, including follow-up of PSEG Nuclear’s revised submittal as per a meeting held between NRC staff and PSEG Nuclear on Wednesday, May 10, 2000;

The inspector also toured and observed the following activities to evaluate the effectiveness of PSEG Nuclear’s radioactive gaseous and liquid effluent control programs.

- Walkdowns to determine the availability of radioactive liquid/gaseous effluent RMS and for determining the equipment material condition;
- Walkdowns for determine the operability of air cleaning systems and for determining the equipment material condition; and

- Observation of the training process for the gamma spectrometry measurements techniques.

b. Findings

No findings of significance were identified.

PS2 Radioactive Material Processing and Shipping

a. Inspection Scope

The inspector reviewed PSEG Nuclear's facilities, processes and programs for the collection, processing, treatment, shipping, storage and disposal of radioactive materials and radwaste. The inspector reviewed the following: in-plant liquid and solid waste systems; waste processing and sampling program; shipment activities and records; assurance of quality, including corrective action reports; and training.

The inspector performed system reviews, which included system descriptions, control panel review, facilities tours, and a review of system changes in accordance with 10 CFR 50.59. Systems/subsystems reviewed included: chemistry & volume control; spent fuel pool clean-up; floor drain; equipment drain; miscellaneous waste; and, solid waste processing. The inspector also toured current and abandoned in-place radwaste equipment and facilities, and interim storage locations used for processed radwaste. Areas toured are listed in the supplemental information attached.

The inspector reviewed PSEG Nuclear's Process Control Program (PCP), including: PCP procedure (NC.RP-AP.ZZ-0900[Q], rev. 0, "Process Control Program Administration"); process documentation; scaling factor derivation, sampling type, sampling frequency, and effect of changing plant conditions (NC.RP-RW.ZZ-0902[Q], rev. 0, "Radioactive Waste Sampling and Classification"); and, determination of waste characteristics and waste classification.

The inspector selected five solid radwaste shipping records for detailed review against the requirements contained in 10 CFR Parts 20, 61 and 71, and 49 CFR Parts 100-177. The shipments selected included spent resin, laundry, and dry active waste, and were nos. SA-01-66; SA-01-75; SA-01-80; SA-01-81; and, SA-01-82 .

The inspector reviewed PSEG Nuclear's program for assurance of quality in the radwaste processing and radioactive materials transportation program by reviewing: quality assurance assessment reports (2000-0155; 2000-0247; 2000-0153; 2001-0003); quality assurance assessment monitoring feedbacks (2001-0067; 2001-0113); audits of vendors providing waste processing services and/or certified shipping containers (Nuclear Utilities Procurement Issues Council [NUPIC] Audit Nos. 16587 and 17038); departmental self-assessments (80033665-0040; 80030976; and, RP4Q-01-002); and, event reports involving the radwaste and transportation program in 2001.

The inspector reviewed PSEG Nuclear's program of training for personnel involved in the radwaste and radioactive materials transportation program with regard to the requirements contained in NRC IE Bulletin 79-19 and 49 CFR, Subpart H. Records

reviewed included training requirements, course outlines/training modules (Lesson plan #0499-98B.01B-LES001-00, “Radioactive Materials Shipping”), test questions, examinations and examination scores. Reviewed records were for licensee personnel in materials handling, radiation protection and radwaste.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

OA1 Performance Indicator Verification

.1 Emergency Planning Performance Indicators (PIs)

a. Inspection Scope

The inspector reviewed PSEG Nuclear’s procedure for developing the data for the EP PIs which are: (1) Drill and Exercise Performance (DEP); (2) ERO Drill Participation; and (3) ANS Reliability. The inspector also reviewed PSEG Nuclear’s drill/exercise reports, training records and ANS testing data for 2001 to verify the accuracy of the reported data. The review was performed in accordance with NRC Inspection Procedure 71151. The acceptance criteria are 10 CFR 50.9 and Nuclear Energy Instiute (NEI) 99-02, Rev. 1, Regulation Assessment Performance Indicator Guideline.

A notification (listed in the supplement to this report) was reviewed that was generated to address an inspector observation.

b. Findings

No findings of significance were identified.

.2 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope

The inspector reviewed the following documents to ensure PSEG Nuclear met all guidance on the PI from the third quarter 2000 to the third quarter 2001 for all units:

- Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- Associated procedures.

The information contained in these records was compared against the criteria contained in NEI 99-02, Rev. 1, to verify that conditions that met the NEI criteria were recognized, identified, and reported as a PI occurrence.

b. Findings

No findings of significance were identified.

.3 Occupational Radiation Safety Performance Indicator

a. Inspection Scope

The inspector reviewed a listing of licensee event reports (LERs) for the period April 1, 2001, through November 30, 2001, for issues related to the occupational radiation safety performance indicator. The information contained in these records was compared against the criteria contained in NEI 99-02, Revision 1, to verify that all conditions that met the NEI criteria were recognized, identified, and reported as a PI.

b. Findings

No findings of significance were identified.

.4 Safety System Functional Failure and Safety System Unavailability Performance Indicators - Units 1 and 2

a. Inspection Scope

The inspectors reviewed the safety system unavailability and safety system functional failure data reported by PSEG Nuclear for Salem Units 1 and 2. The review encompassed the last four quarters of reported data (September 2000 - September 2001), and included a review of selected operator logs, LERs, and corrective action program documents.

b. Findings

No findings of significance were identified.

OA2 Identification and Resolution of Problems

.1 (Closed) EA 50-272; 311/1997-257 Fire Barriers Systems Violation

In May 1993 NRC inspectors found that the fire resistive capability of three types of Electrical Raceway Fire Barrier Systems (ERFBSs) at Salem Nuclear Generation Station were in question. These conclusions were based on the fact that the installed configurations of the ERFBSs were not representative of the tested configurations approved by the NRC. During a fire protection program inspection in April 1997, inspectors found that the qualification status of each fire barrier type remained unchanged since the 1993 inspection. On October 8, 1997, the NRC issued violations associated with the questionable fire barrier systems. PSEG Nuclear responded to these violations by placing the issues in the corrective action program and initiating a cable raceway fire wrap resolution plan. The plan was composed of three phases to achieve final resolution of the ERFBS issues at the site. PSEG Nuclear expected to complete the program by the end of 2002. Additionally, Inspection Report 50-272; 311/1999-010 identified a White finding regarding the failure of Salem's, Unit 2, 4160 VAC Switchgear Room CO_2 fire suppression system to meet CO_2 concentration requirements.

A meeting between PSEG and the NRC staff was held on April 5, 2001, to discuss the results of PSEG's engineering evaluation for the ERFBS project. PSEG Nuclear discussed an option involving the installation of mechanical (piping) crossties between the boric acid storage tanks (BATs), volume control tanks (VCTs) and refueling water storage tanks (RWSTs), and a power supply crosstie between the Unit No. 1 and the Unit No. 2 hot shutdown panels. The mechanical ties would provide an additional source of reactor coolant system make-up, reactor coolant pump seal injection and reactor coolant system boration. The hot shutdown panel crosstie would provide an additional redundant power source for each unit's hot shutdown panel.

This item has been entered into PSEG Nuclear's corrective action program (AR 0970412077) for resolution and therefore this unresolved item is closed.

OA3 Event Follow-up

.1 (Closed) LER 50-311/1999-008 Fire Program Deficiency - Limit Switch Cables Subject to Multiple Hot Shorts in Same Fire Area: During review of the fire protection program and post fire safe shutdown analysis, PSEG Nuclear determined that cables associated with the limit switches for both of the service water header valves (SW22) were routed through the same fire area (1(2)FA-MP-78I - mechanical penetration area). In the event of a fire in this fire area, hot shorts could cause closure of both header valves causing the loss of service water to safety related equipment. Loss of service water could result in the loss of some equipment necessary to maintain post fire safe shutdown. The fire area in question had been subject to compensatory actions (hourly fire watch) due to fire wrap issues identified during a previous NRC inspection. The original post fire safe

shutdown analysis did not consider external hot shorts for the limit switch cables associated with motor operated valves per the guidance provided in Generic Letter (GL) 86-10.

Upon subsequent review PSEG Nuclear determined that the cable routing of the limit switch cables, cable construction and the proximity of these cables to power cables would prevent them from being susceptible to an external hot short event.

The inspector reviewed documentation associated with this issue and found that PSEG Nuclear's evaluation of the susceptibility of the service water limit switch cables to external hot shorts was reasonable. The evaluation identified no energized cables in the cable trays with the service water limit switch cables that could cause an external hot short. With no energized cables routed with the service water limit switch cables, a fire in the fire area of concern would not cause the loss of service water. The inspector identified no findings of significance. No violations of NRC requirements were identified. This issue was evaluated and tracked in PSEG Nuclear's corrective action program (Notification 80037103). LER 50-311/1999-008 is closed.

.2 (Closed) LER 50-272/00-005-00: Salem Unit 1 Manual Reactor Trip. This LER described a reactor trip that occurred on December 5, 2001 due to a failed solid state protection system circuit card. This event was discussed in NRC Inspection reports 2000-10 and 2001-05. No new information was provided and this LER is closed.

.3 (Closed) LER 50-311/01-006-00: Emergency Core Cooling System (ECCS) Leakage Outside Containment Exceeded Dose Analysis Limits. This LER described an event involving excessive packing leakage from the 2CV49 valve that resulted in a condition where exposure to the control room operators could have exceeded the 10 CFR 50, Appendix A, General Design Criterion 19, limits following a postulated loss of coolant accident (LOCA). This event is described more fully in Section OA7 (Licensee Identified Violations) of this report and the LER is closed.

.4 (Closed) LER 50-311/01-007-00: Inadequate Verification Results in TS 3.6.3 not being met. This LER described an event where PSEG disabled two containment isolation valves but did not isolate the affected containment penetration as required by TS 3.6.3. This event is described more fully in Section OA7 (Licensee Identified Violations) of this report and the LER is closed.

.5 (Closed) LER 50-272/01-008: Salem Unit 1 Manual Reactor Trip. This LER described an event involving a manual reactor trip that was inserted due to a loss of condenser vacuum. The LER described the sequence of events, causal factors and corrective actions for the reactor trip. The inspector noted that the LER did not discuss a causal factor related to the adequacy of the abnormal operating procedures and operator knowledge to restore critical electrical loads subsequent to a loss of the #4 station power transformer. The inspector reviewed PSEG Nuclear Condition Report (CR) 70019935 and noted that appropriate corrective actions were identified for this causal factor. The inspector concluded that the corrective actions described in the LER along with those identified in CR 70019935 were reasonable and complete. This LER is closed.

.6 (Closed) LER 50-272/01-002-01 and LER 50-272/01-002: Past Non-Compliance With The Auxiliary Building Ventilation Technical Specification Flow Requirements. This LER and supplement described a historical event that involved a mis-positioned auxiliary building ventilation system fire damper. PSEG Nuclear identified this event during a root cause investigation into an event discussed in NRC Inspection Report 00-11. No new information was identified in these LERs. These LERs are closed.

OA6 Management Meetings

a. Exit Meeting Summary

On January 9, 2002, the inspectors presented their overall findings to members of PSEG Nuclear management led by Mr. Dave Garchow of Salem Operations. PSEG Nuclear management stated that none of the information reviewed by the inspectors was considered proprietary.

OA7 Licensee Identified Violations. The following findings of very low significance were identified by PSEG Nuclear and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as Non-Cited Violations (NCV).

.1 NCV 50-311/01-11-01: 10 CFR 50, Appendix B, Criterion V, requires that activities affecting quality shall prescribed by documented instructions that include appropriate acceptance criteria to determine that important activities have been satisfactorily accomplished. Contrary to the above, PSEG Nuclear determined on September 6, 2001, that the packing data sheet for the 2CV49 valve was incorrect. As a result, valve 2CV49 developed an excessive packing leak that could have resulted in an exposure to the control room operators in excess of the 10 CFR 50, Appendix A, General Design Criteria 19 limits following a postulated LOCA. This issue was entered into PSEG Nuclear's corrective action program as Notification 20076547.

NCV 50-311/01-11-02: TS 3.6.3, requires that inoperable containment penetration isolation valves be restored to an operable condition within four hours or the associated penetration shall be isolated. Contrary to the above, PSEG Nuclear disabled two containment isolation valves (22SW58 and 22SW72) on September 23, 2001, but did not isolate the associated penetration within four hours as required by TS 3.6.3. This issue was entered into PSEG Nuclear's corrective action program as Notification 20078047.

NCV 50-311/01-11-03: TS 4.3.3.9 and associated Table 4.3-13, item 1.b, require that a functional test of the radioactive waste gas holdup system effluent oxygen monitoring system be functionally tested monthly. TS 4.0.2 states, in part, that the surveillance requirement shall be performed within the specified surveillance interval with a maximum allowable not to exceed 25 percent of the specified surveillance interval. Contrary to the above, the Unit 2 waste gas analyzer surveillance was not completed until November 29, 2001. This was approximately four days past the maximum allowable overdue date of November 24, 2001. This missed surveillance test issue was entered into PSEG Nuclear's corrective action program as Notification 20084738.

NCV 50-272; 50-311/01-011-04: TS Section 6.10.d requires that records of surveillance activities, inspections, and calibrations, required by these TS, be retained for at least five years. The radiological calibration results for Chemical Waste Basin Monitor (R37) and Unit 1 Containment Fan Cooler-Service Water Line Discharge Monitor (1R13B) for the year 2000 were not retrievable. PSEG Nuclear placed this issue into its corrective action system as a Notification Report (Notification 20084063). The finding was determined to be of very low safety significance, because, the issue did not impair the ability to assess the public dose, and did not result in exceeding public dose limits listed in Appendix I of 10 CFR 50 or 10 CFR 20.1301(d). The issue was not reportable in the Annual Radiological Effluent Report. Further, PSEG Nuclear produced a work record indicating the calibrations had been properly performed.

ATTACHMENT
SUPPLEMENTAL INFORMATION

a. Key Points of Contact

C. Banner, E Emergency Preparedness Supervisor
D. Burgin, Emergency Preparedness Manager
K. Davison, Salem Operations Manager
D. Garchow, Vice-President - Operations
J. Gomeringer, Radiation Protection Specialist - Shipping
M. Hassler, Radiation Protection Operations Superintendent
R. Krupa, Training Instructor
M. Moser, Licensing
K. O'Hare, Acting Radiation Protection Manager
B. Thomas, Licensing
L. Waldinger, Director - Site Operations
R. Werline, Radiation Waste Operations

b. List of Items Opened, Closed, and Discussed

Opened/Closed

50-311/01-11-01	NCV	Failure to develop adequate instructions to repack the 2CV49 valve as required by 10 CFR 50, Appendix B, Criterion V. (Section 4OA7)
50-311/01-11-02	NCV	Failure to isolate the affected penetration as required by TS 3.6.3 subsequent to disabling service water valves 22SW58 and 22SW72. (Section 4OA7)
50-311/01-11-03	NCV	Failure to perform functional testing of the Unit 2 radioactive waste gas holdup system effluent oxygen monitoring system within the surveillance interval specified by TS 4.3.3.9 and TS 4.0.2. (Section 4OA7)
50-272; 311/01-11-04	NCV	Failure to maintain year 2000 calibration records for Chemical Waste Basin Monitor (R37) and Unit 1 Containment Fan Cooler-Service Water Line Discharge Monitor (1R13B) required by TS 6.10.d. (Section 4OA7)

Closed

50-311/99-008-00	LER	Fire Program Deficiency - Limit Switch Cables Subject to Multiple Hot Shorts in the Same Fire Area. (Section 40A3)

50-272/00-005-00	LER	Salem Unit 1 Manual Reactor Trip due to a failed circuit card. (Section 4OA3)
50-272/01-002-00 and 50-272/01-002-01	LERs	Past Non-Compliance With The Auxiliary Building Ventilation Technical Specification Flow Requirements. (Section 4OA3)
50-272/01-008-00	LER	Salem Unit 1Manual Reactor Trip. (Section 4OA3)
50-311/01-006-00	LER	ECCS Leakage Outside Containment Exceeded Dose Analysis Limits. (Section 4OA3)
50-311/01-007-00	LER	Inadequate Verification Results in TS 3.6.3 not being met. (Section 4OA3)
50-272; 50-311/02014 (EA# 1997-257)	VIO	Fire Barrier Systems Violation (Section 40A3)

c. List of Documents Reviewed

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

CR 80038006-0080	Revise siren testing/maintenance procedure to adequately describe current testing program and for consistency with design basis document and E-Plan.
CR 80038006-0020	Revise EPIP 204S/H to indicate it's a backup procedure and describe the initial callout process.
CR 80038006-0030	Create Media Training Package to media contacts for 2001
CR 80038006-0060	Create Monthly EP ERO qualification PI and correct NRC minor violation regarding ERO qualification lapses
CR 80038006-0070	Enhancement revisions to NC.EP-ZZ-1003(Q), Effectiveness Reviews
CR 80038006-0040	Revise E-Plan, Section 8, to reflect how annual media awareness training will be given.
CR 80038006-0090	Review ENC critiques and evaluate repeat findings for correction
CR 80038006-0050	Ensure DEP PI original data is maintained from LOR drills for NRC review.

d. List of Acronyms

ANS	Alert and Notification System
AR	Action Request
BAT	Boric Acid Tank
CBV	Containment Building Ventilation
CFCU	Containment Fan Coil Unit
CFR	Code of Federal Regulations

CO_2	Carbon Dioxide
CR	Condition Report
CVC	Chemical and Volume Control
DC	Direct Current
DEP	Drill and Exercise Performance
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
EP	Emergency Preparedness
ERFBS	Electrical Raceway Fire Barrier Systems
ERO	Emergency Response Organization
GL	Generic Letter
gpm	Gallons per Minute
HEPA	High Efficiency Particulate Air
LERs	Licensee Event Reports
LOCA	Loss of Coolant Accident
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NUPIC	Nuclear Utilities Procurement Issues Council
OD	Operability Determination
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PCP	Process Control Program
PI	Performance Indicator
PSEG	Public Service Electric Gas
QA	Quality Assurance
RHR	Residual Heat Removal
RMS	Radiaiton Monitoring System
RWST	Refueling Water Storage Tank
SDP	Significance Determination Process
SMD	Solar Magnetic Disturbance
SRO	Senior Reactor Operator
SSCs	Systems, Structures, and components
SW	Service Water
TS	Technical Specification
VAC	Volts Alternating Current
VCT	Volume Control Tank

e. <u>List of Areas Inspected</u>

Auxiliary Building elevation 64', cubicles containing:

Chemistry and volume control system monitor tanks # 11, 12, 21 & 22 and pumps
Waste holdup tanks # 11, 12, 13, 21, 22 & 23 and pumps
Chemistry and volume control system holdup tanks # 11, 12, 13, 21, 22 & 23 and pumps

Auxiliary Building elevation 84', cubicles containing:

Unit 2 spent resin tank and pumps

Auxiliary Building elevation 100', cubicles containing:

Boric acid evaporator unit #1
Waste evaporator unit #1
Unit 1 demineralizer ion exchanger room
Unit 2 demineralizer ion exchanger room
Storage and bailing area
Drumming stations 1 & 2
Drum storage vaults north & south
Evaporator bottoms transfer pump

Auxiliary Building elevation 111', cubicles containing:

Holdup tank