July 13, 2000

Mr. Harold W. Keiser
President and Chief Nuclear Officer
Public Service Electric & Gas Company
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: NRC INSPECTION REPORT 05000272/2000-005, 05000311/2000-005

Dear Mr. Keiser:

On July 1, 2000, the NRC completed an inspection of your Salem 1 & 2 reactor facilities. The enclosed report presents the results of that inspection. The preliminary findings were presented to PSEG Nuclear management led by Mr. Tim O'Connor in an exit meeting on July 7, 2000.

NRC inspectors examined numerous activities as they related to reactor safety and compliance with the Commission's rules and regulations, and with the conditions of your operating license. The inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, it involved six weeks of resident inspection and region-based inspections of occupational radiation health, maintenance rule and plant security. There were no inspection findings.

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Sincerely,

/RA/

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

Enclosure: Inspection Report 05000272/2000-005, 05000311/2000-005

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos:	50-272, 50-311
License Nos:	DPR-70, DPR-75
Report No:	05000272/2000-005, 05000311/2000-005
Licensee:	Public Service Electric and Gas Company (PSEG)
Facility:	Salem Nuclear Generating Station, Units 1 & 2
Location:	P.O. Box 236 Hancocks Bridge, NJ 08038
Dates:	May 21 - July 1, 2000
Inspectors:	Scott A. Morris, Senior Resident Inspector F. Jeff Laughlin, Resident Inspector Todd H. Fish, Operations Engineer Joseph T. Furia, Senior Health Physicist Steven Dennis, Operations Engineer John G. Caruso, Operations Engineer Gregory C. Smith, Safeguards Specialist Julian Williams, Senior Operations Engineer Suresh Chaudhary, Reactor Inspector
Approved By:	Glenn W. Meyer, Chief, Projects Branch 3 Division of Reactor Projects

SUMMARY OF FINDINGS

Salem Generating Station, Units 1 & 2
NRC Inspection Report 05000272/2000-005, 05000311/2000-005

The report covers a six-week period of resident inspection and region-based inspections of occupational radiation health, maintenance rule, and plant security using the guidance contained in NRC Inspection Manual Chapter 2515*. The significance of issues is indicated by their color (green, white, yellow, or red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609 (see Attachment 1).

- There were no findings.

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Report Details

SUMMARY OF PLANT STATUS

Unit 1 began the period at 100% and remained there until June 3, 2000 when operators reduced power to 20% and took the main turbine off line to repair an electro-hydraulic control system oil leak. Operators restored the unit to full power on June 4, 2000. On June 12, 2000 operators reduced power to 72% due to transmission line limitations with the 500 KV Dean's line out of service. They returned the unit to full power on June 13, 2000 after restoration of the Dean's line. Operators again reduced power on June 23, 2000 to 90% to perform plant maintenance and restored the unit to full power on June 27, 2000, where it remained for the rest of the period.

Unit 2 began the period at 100% and remained there until June 18, 2000 when operators reduced power to 46% for main turbine valve testing, and subsequently to 27% to repair a main turbine stop valve. Operators restored the unit to full power on June 19, 2000 where it generally remained for the rest of the period.

1. REACTOR SAFETY
(Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)

1R04 Equipment Alignment

a. Inspection Scope

The inspectors completed partial walkdowns of the redundant emergency diesel generators (EDGs) during planned maintenance and post-maintenance testing of the 1B (week of June 5) and 2C (week of June 12) EDGs. The inspectors verified that no maintenance was being performed on the redundant trains and that major components were aligned and ready for operation. The inspectors concluded that the redundant trains were operable and properly aligned in accordance with plant procedures and drawings to support normal and emergency operations.

b. Issues and Findings

There were no findings identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors toured Unit 1 and 2 areas important to reactor safety, including the relay rooms, service water bays, and emergency diesel generator rooms, to assess PSEG's control of transient combustible materials, the readiness of fire detection and suppression systems, and the working condition of fire barriers in these areas. The inspectors also interviewed a fire protection supervisor concerning the status of equipment impairments.

b. Issues and Findings

There were no findings identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed simulator training sessions during licensed operator training for two operating crews to assess the adequacy of the training scenarios utilized, operator performance in mitigating the consequences of events, and the effectiveness of the evaluators' critiques.

b. Issues and Finding

There were no findings identified.

1R12 Maintenance Rule Implementation

.1 Quarterly Inspection

a. Inspection Scope

The inspectors reviewed maintenance rule documentation including system performance criteria, the maintenance rule scoping document which includes examples of system functional failures, and the coding of system failures in the corrective action program to independently verify adequate maintenance rule implementation for the following risk-significant systems: chemical and volume control, component cooling water, chilled water, service water, gas turbine generator, and containment building ventilation. The inspectors also reviewed system health reports and PSEG's action plans to improve system reliability as well as interviewed system managers and maintenance rule personnel. The inspectors assessed the appropriateness of goals and corrective actions for maintenance rule (a)(1) systems and the effectiveness of maintenance efforts for these systems.

b. Issues and Findings

There were no findings identified. The inspector noted one instance where PSEG did not properly code a failure of the 13 component cooling pump as a preventable system functional failure. This was documented in notification 20032259 and corrected.

.2 Biennial Inspection

a. Inspection Scope

The inspectors reviewed the periodic evaluations required by 10 CFR50.65 (a)(3) for Salem to verify that all structures, systems and components (SSCs) were included in the evaluations and the balancing of reliability and unavailability was given adequate consideration.

The inspectors reviewed the following (a)(1) high safety significant systems to verify that; (1) goals and performance criteria were appropriate, (2) industry operating experience was considered, (3) corrective action plans were effective, and (4) performance was being effectively monitored:

Unit 1 chemical volume control
Units 1 & 2 nuclear instrumentation
Unit 1 chilled water
Units 1 & 2 containment building ventilation
Station air/control air

The inspectors reviewed the following (a)(2) high safety significant systems to verify that performance was acceptable:

Unit 2 chemical volume control
Units 1 & 2 residual heat removal
Units 1 & 2 auxiliary feedwater
Units 1 & 2 safety injection

b. Issues and Findings

There were no findings identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed PSEG's risk assessment for numerous online maintenance plans and performed a detailed review of maintenance on the 1B emergency diesel generator (EDG) (week of June 5), 2C EDG (week of June 12), 1A EDG (week of June 26), Unit 1 main turbine voltage regulator (week of June 5), and the 22 containment fan cooler unit (week of June 26) to verify that these activities were adequately controlled to minimize risk. The inspectors also assessed contingency plans and actions taken to minimize time spent in higher risk configurations.

The inspectors reviewed emergent maintenance on the 1B EDG involving an engine cylinder fuel leak, the 1A EDG involving a service water leak on the lube oil cooler outlet valve, and a boric acid addition to the 11 ECCS accumulator due to decreasing acid concentration from check valve back-leakage. For the 11 accumulator work, the inspectors reviewed the data from the last surveillance performed on the leaking check valves, the temporary procedure for boric acid addition to address the back-leakage issue, and the 10 CFR 50.59 safety evaluation to perform the procedure. The inspectors also verified that probabilistic risk assessment personnel performed updated risk assessments for emergent work on safety systems.

b. Issues and Findings

There were no findings identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

The inspectors reviewed the June 12, 2000 loss of the 5021 (500KV) Dean's line, which required the arming of the Trip-a-unit circuitry in accordance with procedure SC.OP-SO.500-0001, *Trip-A-Unit Scheme Operation*, and the subsequent power reduction to 72% due to thunderstorms near the plant. This event was complicated by the previous erratic operation of the automatic voltage regulator, which required operator actions to stabilize main generator output voltage. The inspectors also reviewed the June 13, 2000 erratic operation of the automatic voltage regulator during the performance of procedure S1.OP-PT.GEN-0001, *Main Generator and Exciter Field Ground Circuit Tests,* which caused operators to shift the voltage regulator to manual control. The inspectors verified that operators took appropriate actions in accordance with operating and alarm response procedures to stabilize main generator output voltage.

b. Issues and Findings

There were no findings identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors observed portions of post-maintenance testing (PMT) activities and reviewed PMT data for the following risk-significant systems: 1B EDG (June 8), 1A EDG (June 8), and the 11 residual heat removal pump (June 30). The inspectors verified that test activities and procedures were adequate to assure system operability and that the tests met the appropriate acceptance criteria at the completion of planned maintenance.

b. Issues and Findings

There were no findings identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions of surveillance tests and reviewed test results for the following risk-significant systems: 2B EDG (June 6)), Unit 2 auxiliary building ventilation system (weeks of 6/12, 6/19, and 6/26/2000), 11 auxiliary feed water pump (June 27), power range monitor channel #4 (June 27), and the 21 containment spray pump (June 28). The inspectors verified that test activities satisfied technical specification and procedural requirements, and that all components were capable of performing their intended safety functions. The inspectors also performed a visual inspection of each system to check for signs of degradation and verified that minor deficiencies were documented in the corrective action program.

b. Issues and Findings

There were no findings identified.

Cornerstone: Emergency Preparedness [EP]

1EP1 Drill, Exercise, and Actual Events

a. Inspection Scope

The inspectors observed portions of the June 1, 2000, Salem emergency preparedness drill in the training simulator and the emergency response facility. This drill also provided data for the NRC performance indicator concerning emergency response organization drill participation. The inspectors concluded that event classifications, event notifications, and protective action recommendations were appropriate and accurate.

b. Issues and Findings

There were no findings identified.

2. RADIATION SAFETY

Occupation Radiation Safety [OS]

OS1 Access Control

a. Inspection Scope

The inspector reviewed the access control program by examining the controls established for three areas where personnel could receive significant radiation exposure, including postings, markings, control of access, dosimetry, surveys and alarm set points. Areas selected were located throughout the radiologically controlled area (RCA) and included the Unit 1 volume control tank room (a locked high radiation area),

Unit 1 spent fuel filter skimmer area (a high radiation area) and the radwaste processing area (both high and locked high radiation areas). The inspector reviewed the following controls: key control for locked high radiation areas; use of radiation work permits to control access to radiologically significant areas; and, pre-job radiological briefings.

The inspector conducted job performance observations to evaluate radiation worker performance with respect to stated radiation protection work requirements. This also included verification of radiological controls, such as adequacy of surveys and radiation protection technician coverage. The inspector observed three Unit 2 containment entries during power operations on May 31, 2000. The inspector reviewed the radiation work permit utilized for these entries; attended the pre-job briefings presented to the workers by the radiation protection staff; observed controls present for access to this posted high radiation area; reviewed alarm set points; and reviewed calculations of potential internal exposures and neutron exposures.

The inspector reviewed PSEG's condition reports written for radiological issues related to radiological worker or radiation protection technician performance, for the period of April 1, 2000 through May 31, 2000. The review focused on observable patterns traceable to similar causes.

b. Issues and Findings

There were no findings identified.

OS2 ALARA Planning and Controls

a. Inspection Scope

The inspector reviewed work performance during the current operating cycle, including an evaluation of the use of engineering controls to achieve dose reductions; review of the use of low dose waiting areas; review of on-the-job supervision provided to workers; and a review of individual exposures from selected work groups. The inspector also evaluated engineering controls for dose reductions and an analysis of source term reduction plans.

The inspector observed radiation worker and radiation protection technician performance during high dose rate and/or high exposure jobs to determine if the training/skill level was sufficient with respect to the radiological hazards. Additionally, the inspector conducted reviews to examine the assumptions and basis for the various job exposure estimates, including the methodology utilized for estimating job-specific exposures. The inspector reviewed PSEG's job guides utilized for the ALARA program. The job guides examined included: reactor maintenance activities; steam generator activities; pressurizer activities; filter activities; reactor coolant pump activities; regen/excess letdown room activities; and shielding activities.

b. Issues and Findings

There were no findings identified.

OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspector reviewed PSEG's inventory of survey instruments and personnel contamination monitors and its program for daily source checking, maintenance and repair. This included walkdowns of the radiological instrumentation calibration and repair facility and instrumentation issue areas.

The inspector reviewed calibration records for portable survey instruments utilized by radiation protection technicians to ascertain and document radiological conditions. Instruments utilized could measure alpha, beta, gamma and neutron radiation, as appropriate. The inspector examined a statistically representative sampling of each type of instrument via a review of calibration and source check records; observed instrument calibrations; and reviewed documentation of calibration source traceability to the National Institute of Standards and Technology (NIST) and records of source usage.

b. Issues and Findings

There were no findings identified.

3. SAFEGUARDS

Physical Protection [PP]

PP1 Access Authorization

a. Inspection Scope

The inspectors conducted the following activities to determine the effectiveness of PSEG's behavior observation portion of the personnel screening and fitness-for-duty programs:

They interviewed five (5) supervisors representing the maintenance, procurement, radiation protection, fire protection, and electrical distribution departments on June 28 and 29, 2000, regarding their understanding of behavior observation responsibilities and the ability to recognize aberrant behavior traits. Additionally, the inspectors interviewed five (5) individuals who performed escort duties to establish their knowledge level of those duties. The inspectors reviewed two (2) access authorization/ fitness-for-duty self-assessments, an audit, event reports and loggable events for the four previous quarters, and behavior observation training procedures and records.

b. Issues and Findings

There were no findings identified.

PP2 Access Control

a. Inspection Scope

The inspectors conducted the following activities during the period June 26-30, 2000, to verify that PSEG had effective site access controls and equipment in place designed to detect and prevent the introduction of contraband (firearms, explosives, incendiary devices) into the protected area:

They checked a random sample of personnel granted unescorted access to the protected and vital areas to ensure that they were properly screened, identified and authorized. They observed site access control activities, including personnel and package processing through the search equipment at the access point during peak ingress periods on June 27 and 28, 2000, and vehicle searches on June 28, 2000. On June 29, 2000, the inspectors observed the testing of all access control equipment including metal detectors, explosive material detectors, and X-ray examination equipment. They also reviewed the Access Control event log, a security audit, and three (3) maintenance work requests.

b. Issues and Findings

There were no findings identified.

4. OTHER ACTIVITIES [OA]

OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed PSEG's program for gathering and submitting data for the Fitness-for-Duty, Personnel Screening, and Protected Area Security Equipment Performance Indicators (PIs). The review included PSEG's tracking and trending reports, personnel interviews and security event reports for the PI data submitted from the second quarter of 1997 through the first quarter of 2000.

b. Issues and Findings

There were no findings identified.

OA6 Management Meetings

a. Exit Meeting Summary

On July 7, 2000, the inspectors presented their overall findings to members of PSEG management led by Mr. Tim O'Connor, Vice President of Plant Support. PSEG management acknowledged the findings presented and did not contest any of the inspectors' conclusions. Additionally, they stated that none of the information reviewed by the inspectors was considered proprietary.

b. PSEG/NRC Management Meeting

On June 15, 2000, members of NRC Region I management led by Mr. Randy Blough, Director, Division of Reactor Projects, met with members of PSEG management led by Mr. Harry Keiser, President and Chief Nuclear Officer, at the Salem/Hope Creek Processing Center auditorium in Hancocks Bridge, New Jersey. NRC managers presented the Salem annual assessment based on the May 18, 2000 Annual Assessment Letter. The meeting was open for public observation.

ITEMS OPENED AND CLOSED

None

LIST OF ACRONYMS USED

ALARA	As low as is reasonably achievable
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PDR	Public Document Room
PI	Performance Indicator
PMT	Post-Maintenance Testing
PSEG	Public Service Electric and Gas
RCA	Radiologically controlled area
TSAS	Technical Specification Action Statement

ATTACHMENT 1

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be

taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.