October 30, 2000

Mr. Harold W. Keiser
President and Chief Nuclear Officer
PSEG Nuclear Limited Liability Company
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: NRC INSPECTION REPORT 05000272/2000-007, 05000311/2000-007

Dear Mr. Keiser:

On September 30, 2000, the NRC completed a routine seven week period of resident inspection at 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. J. Robertson in an exit meeting on October 13, 2000.

The NRC resident 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 selected reviews of procedures and records, observations of activities, and interviews with personnel. Each inspection issue was evaluated using the applicable Significance Determination Process (SDP). During this inspection no findings were identified.

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Sincerely,

**/RA/**

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

Enclosure: Inspection Report 05000272/2000-007, 05000311/2000-007

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REGION I

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|---|---|
| Docket Nos: | 50-272, 50-311 |
| License Nos: | DPR-70, DPR-75 |
| Report No: | 05000272/2000-007, 05000311/2000-007 |
| Licensee: | PSEG Nuclear LLC |
| Facility: | Salem Nuclear Generating Station, Units 1 & 2 |
| Location: | P.O. Box 236<br>Hancocks Bridge, NJ 08038 |
| Dates: | August 13 - September 30, 2000 |
| Inspectors: | Scott A. Morris, Senior Resident Inspector<br>F. Jeff Laughlin, Resident Inspector<br>Joseph G. Schoppy, Senior Resident Inspector (Hope Creek) |
| Approved By: | Glenn W. Meyer, Chief,<br>Projects Branch 3<br>Division of Reactor Projects |

## Summary of Findings

IR 05000272-00-07, IR 05000311-00-07; on 08/13 - 09/30/2000; Public Service Electric Gas Nuclear LLC; Units 1 and 2; Resident Operations Report.

This report covers a seven week period of resident inspection 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 80% power during power ascension after an August 9, 2000 reactor trip. Operators returned the unit to full power on August 14, 2000. On September 6, 2000, operators reduced power to 40% when the unit experienced a loss of all circulating water traveling screens. They restored the unit to full power on September 7, 2000. On September 23, 2000, operators removed the unit from the off-site power grid to repair the main turbine generator voltage generator. Operators re-synchronized the unit to the grid on September 24, 2000, and returned it to full power operation on September 26, where it remained for the rest of the report period.

Unit 2 began the period at 100% power where it remained until September 18, 2000, when operators commenced an end of operating cycle coastdown prior to refueling outage 11. The unit was operating at 89% power when the report period ended.

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

R04 Equipment Alignment

a. Inspection Scope

The inspectors completed partial walkdowns of redundant trains during pre-planned on-line maintenance of the following equipment:

- Unit 1 emergency diesel generators
- Unit 1 & 2 auxiliary feedwater pumps
- 12 chemical and volume control system charging pump
- 12 chiller unit
- 12 component cooling water pump

The inspectors verified that there were no outstanding tagouts on the redundant equipment, that major components were operational, and that protected equipment had the appropriate administrative controls.

b. Issues and Findings

There were no findings identified.

R05 Fire Protection

a. Inspection Scope

The inspectors toured plant areas important to reactor safety, including the Unit 1 emergency diesel generator rooms and emergency core cooling system areas in the auxiliary building for both units to assess PSEG's control of transient combustible materials and ignition sources, the material condition and readiness of fire protection

systems, and the operational status of fire barriers. The inspectors also discussed minor deficiencies with fire protection personnel and verified that these deficiencies were tracked in PSEG's corrective action program.

b. Issues and Findings

There were no findings identified.

R11 Licensed Operator Requalification Training

a. Inspection Scope

The inspectors observed a September 6, 2000, simulator training session for one crew during licensed operator training in preparation for the upcoming Unit 2 refueling outage. The inspectors assessed the adequacy of the training scenario, operator performance in carrying out routine outage evolutions and mitigating the consequences of shutdown events, and PSEG's use of operating experience in the training. The inspectors also discussed their observations with the training staff.

b. Issues and Findings

There were no findings identified.

R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed of several Unit 1 and Unit 2 equipment performance deficiencies which arose since January 2000. Maintenance rule (Mrule) program records were examined to determine whether the various issues had been appropriately documented, corrected, coded and trended so as to meet the requirements of 10 CFR 50.65 and PSEG's internal Mrule guidance. The inspectors also reviewed applicable PSEG System Health Reports and discussed specific issues with cognizant system engineers.

b. Issues and Findings

There were no findings identified.

The inspectors identified that PSEG personnel had not consistently adhered to their guidance governing Mrule implementation. Specifically:

- Some corrective action program notifications documenting "in-scope" system performance problems were coded as "not applicable" for Mrule purposes.

- Some equipment deficiencies coded as "system functional failures" did not receive a subsequent evaluation to determine whether the failures were "maintenance preventable."

The inspectors referred these issues to PSEG's Mrule program manager and the applicable system engineers for further review and corrective action.

R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the August 18, 2000 bypass line installation around the service water (SW) discharge pressure control valve (2ST901) for the Unit 2 main turbine and main feed water pump turbine lube oil coolers. This work had the potential to cause an interruption in cooling water flow to these major balance-of-plant components, which could have led to a main turbine and reactor trip, PSEG completed this emergent work with the unit on-line and controlled it as an infrequently performed test or evolution (IPTE). The inspectors evaluated PSEG's risk assessment for this activity, attended the pre-evolution brief, and reviewed pre-planned contingency actions. The inspectors also observed portions of the bypass line installation.

The inspectors closely monitored several emergent work activities on the Unit 2 containment fan cooler units (CFCUs) during the week of August 20, 2000. Three CFCUs were inoperable at various times during the week, which kept the unit in a technical specification action statement for six and one half days of a seven day allowed outage time. The inspectors assessed PSEG's oversight of these activities and verified that other Unit 2 maintenance was appropriately scheduled or controlled to minimize risk.

The inspectors also observed and evaluated PSEG's efforts to resolve emergent equipment failures associated with the Unit 1 circulating water system and the Unit 2 control rod drive mechanism ventilation fans.

b. Issues and Findings

There were no findings identified.

R14 Personnel Performance During Nonroutine Plant Evolutions

a. Inspection Scope

The inspectors observed PSEG's response to a September 6, 2000 loss of all Unit 1 circulating water traveling screens caused by the rupture of the 13A screen wash line. High pressure water from this ruptured line resulted in an electrical ground in a nearby 460V power distribution panel causing a loss of all traveling screens. The inspectors verified that operators implemented appropriate actions per abnormal procedure S1.OP-AB.CW-0001, *Circulating Water System Malfunction,* to maintain adequate circulating water flow to the main condensers and minimize the likelihood and potential consequences of a plant transient. These actions included a unit power reduction from 100% to 40% power.

b. Issues and Findings

There were no findings identified.

R15 Operability Evaluations

a. Inspection Scope

The inspectors performed a detailed review of the August 24, 2000 failure of the 22 CFCU which placed Unit 2 in a seven day technical specification shutdown action statement. The failure was due to abnormal oscillations of flow control valve (22SW223). This valve had exhibited lesser flow oscillations on August 19, 2000, but was not declared inoperable at that time. The inspectors reviewed operating logs and interviewed cognizant operations and engineering personnel to verify that the 22 CFCU in fact remained in an operable condition between the period August 19-22, 2000. Had this CFCU been inoperable, the technical specification allowed outage time would have been only 72 hours versus seven days.

b. Issues and Findings

There were no findings identified.

R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed active Unit 1 & 2 operator workarounds (OWA) to determine whether there were any potential adverse effects on the function of risk significant mitigating systems. The inspectors also independently examined several other known plant system deficiencies to determine whether there were any issues which met the definition of an OWA but were not tracked as such.

b. Issues and Findings

There were no findings identified.

R19 Post Maintenance Testing

a. Inspection Scope

The inspectors observed portions of the post-maintenance testing (PMT) activities and reviewed PMT data following planned and emergent work on the following equipment:

- 12 component cooling water pump
- 22, 24, and 25 containment fan cooler unit service water control valves (SW 223)
- 12 safety-related ventilation chiller unit

The inspectors verified that test activities were properly controlled, adequate to assure system operability, and met the appropriate acceptance criteria. They also discussed test procedures with control room and equipment operators and the cognizant system managers.

b. Issues and Findings

There were no findings identified.

R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors attended 2R11 refueling outage training provided to licensed operators. Additionally, the inspectors reviewed the overall outage plan including the independently-performed outage risk assessment. The inspectors attended the station operations review committee meeting at which this risk assessment was evaluated and verified that PSEG outage planners had established contingency measures for identified high-risk (i.e., minimal defense-in-depth) periods during the outage.

The inspectors also discussed a planned change in PSEG's commitment to the NRC regarding containment equipment hatch operation for the upcoming Unit 2 refueling outage. Specifically, this change involved a plan to allow the containment equipment hatch to remain open (but capable of being closed) with reactor vessel at reduced inventory. Previously the hatch would have to have been closed during such an evolution.

b. Issues and Findings

There were no findings identified.

R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions and reviewed the results of several routine inservice (IST) and surveillance tests (ST) on selected risk-significant systems including:

- 1B emergency diesel generator (EDG) (monthly ST)
- 1SJ12/13 (quarterly back-leakage test)
- 2B EDG (24-hour run and hot restart ST)
- 23 turbine-drive auxiliary feedwater pump (quarterly IST)
- 21 component cooling water pump (quarterly IST)

The inspectors verified that test activities satisfied technical specification and procedural requirements, and that all tested components were demonstrated to be capable of performing their intended safety functions.

b. Issues and Findings

There were no findings identified.

The inspectors identified that operators routinely lubricated and "barred over" the EDGs before monthly surveillance runs. Following extensive discussions with operations and

engineering department personnel, PSEG acknowledged that this practice may be unacceptable pre-conditioning and initiated corrective action notification 20041070 to evaluate the issue. The inspectors will review PSEG's followup to this notification when it has been completed. Until then, this issue will remain unresolved. **(URI 05000272 & 311/2000-007-01)**

R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors conducted a detailed review of the following three temporary (TMOD) packages:

- 99-016/017 *CFCU High Speed/High Flow Operation*
- 99-026 *Temporary Hose Installation for Waste Processing*
- 00-016 *Installation of Bypass Piping Around Valve 2ST901*

The inspectors verified that these TMODs did not affect the design function(s) of any safety systems. They also independently reviewed the associated 10CFR50.59 safety evaluations using design basis documentation, including the Updated Final Safety Analysis Report and technical specifications, to ensure that the TMODs did not affect system operability or invalidate the affected systems' design bases.

b. Issues and Findings

There were no findings identified.

## 4. OTHER ACTIVITIES

OA2 Identification and Resolution of Problems

The following sections of this report describe deficiencies or potential issues with regard to PSEG's problem identification process:

- 1R12 - deficiencies in PSEG maintenance rule implementation
- 1R22 - potential preconditioning of emergency diesel generators

OA5 (Closed) LER 05000272/2000-003-00: *Reactor Trip Caused by a Failed Voltage Regulation Circuit Card in the Rod Control System*. This event was documented in Section 4OA3 of NRC Inspection Report 05000272&311/2000-006. This LER provided no new information and was closed.

OA6 Exit Meeting Summary

On October 13, 2000, the inspectors presented their overall findings to members of PSEG Nuclear management led by Mr. John Robertson of Salem Operations. PSEG Nuclear 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.

## ITEMS OPENED AND CLOSED

**Opened**

| | | |
|---|---|---|
| 05000272 & 311/2000-007-01 | URI | Potential pre-conditioning of emergency diesel generators prior to monthly surveillance tests. (Section R22) |

**Closed**

| | | |
|---|---|---|
| 0500272/2000-003-00 | LER | Reactor Trip Caused by a Failed Voltage Regulation Circuit Card in the Rod Control System. (Section OA5) |

## LIST OF ACRONYMS USED

| | |
|---|---|
| CFCU | Containment Fan Cooler Unit |
| CFR | Code of Federal Regulations |
| EDG | Emergency Diesel Generator |
| IPTE | Infrequently Performed Test or Evolution |
| IST | Inservice Test |
| LER | Licensee Event Report |
| LRW | Liquid Radioactive Waste |
| Mrule | Maintenance Rule |
| NRC | Nuclear Regulatory Commission |
| OWA | Operator Workaround |
| PARS | Publicly Available Records |
| PDR | Public Document Room |
| PMT | Post-maintenance Test |
| PSEG | Public Service Enterprise Group - Nuclear LLC |
| SDP | Significance Determination Process |
| ST | Surveillance Test |
| SW | Service Water |
| TMOD | Temporary Modification |
| URI | Unresolved Item |

# 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.