U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-272/89-10
50-311/89-09

Docket Nos. 50-272
50-311

License Nos. DPR-70
DPR-75 Priority - Category C

Licensee: Public Service Electric and Gas Company
P.O. Box 236
Hancocks Bridge, New Jersey 08038

Facility Name: Salem Generating Station

Inspection At: Hancocks Bridge, New Jersey

Inspection Conducted: May 1-5, 1989

Inspector: _____ 5-18-89
J. Furia, Radiation Specialist date

Inspector: _____ 5-18-89
J. Jang, Senior Radiation Specialist date

Approved by: _____ 5-18-89
J. Kottan, Act. Chief, Effluents Radiation Protection Section date

Inspection Summary: Inspection on May 1-5, 1989 (Combined Inspection Report Nos. 50-272/89-10; 50-311/89-09)

Areas Inspected: Routine unannounced inspection of the effluent, environmental monitoring, transportation and solid radioactive waste programs including: management controls; audits; quality assurance; and implementation of the above programs.

Results: Within the areas inspected, one violation (Radwaste/Quality Assurance) and one unresolved item (Air Cleaning Systems) were identified.

DETAILS

1. Personnel Contacted:

1.1 Licensee Personnel:

* L. Miller, General Manager, Salem
* D. Schultz, Licensing Engineer
  J. Balletto, Environmental Licensing
  J. Russell, Engineer, Nuclear Services
  P. McNulty, Effluent Engineer, Nuclear Services
* J. Wray, Radiation Protection Engineer
  D. Perkins, Manager, Station Quality Assurance
  B. Preston, Manager, Licensing & Regulation
  J. Gomeringer, Radiation Protection
  N. Allman, Research and Testing Laboratory
  R. Farrington, Research and Testing Laboratory
  K. Harris, Research and Testing Laboratory
  W. Schultz, Manager, QA Programs and Audits
  P. Benini, Principle Engineer, QA Audits
  R. Yewdall, Radiation Protection Services
  J. Trejo, Manager, Radiation Protection Services
* E. Galbraith, Chemistry Services
* G. Roggio, Station Licensing Engineer
* D. Mohler, Manager, Radiation Protection/Chemistry
* J. Korsch, Radiation Protection Services
* M. LeFevre, Radiation Protection Tech Supervisor
* M. Pollack, LER Coordinator
* D. Lyons, Technical Engineer
* J. Curham, Lead Engineer
  L. Rajkowski, System Engineer
  W. Lowry, System Engineer

1.2 NRC Personnel:

* S. Pindale, Resident Inspector
* K. Gibson, Senior Resident Inspector

* Denotes personnel who attended the exit interview on May 5, 1989.

2. Scope:

This routine safety inspection reviewed the licensee's program for the areas of liquid and gaseous effluents, radiological environmental monitoring, transportation and solid radioactive waste.

3. Licensee Actions on Previously Identified Items:

(Closed) Inspector Follow-Up (50-272/84-26-02; 50-311/84-26-02) Procedure incorrectly identifies supplier of Thermoluminescent Dosimeters for use in the Environmental Monitoring Program (REMP). The licensee has written a new procedure RTL No. 1.2.1, which properly identifies the source of the dosimeters. This item is closed.

(Closed) Inspector Follow-Up (50-272/87-20-01; 50-311/87-22-01) Revise procedure to include volume of sample to be shipped. Licensee procedure RP 909, Revision 1 incorporates the revisions needed for proper transportation of radioactive materials. This item is closed.

4. Transportation and Solid Radioactive Waste:

Responsibility for the processing and transportation of radioactive materials is conducted by the licensee's radwaste personnel who report through the Radiation Protection Engineer to the Radiation/Chemistry Manager. Waste is collected, processed, packaged and prepared for transportation by the Radwaste staff. Transportation and waste classification is determined by the use of a vendor supplied computer code. In addition, the licensee also provides transportation services and manifesting of shipments of radwaste originating from the Hope Creek Nuclear Generating station which is located adjacent to the Salem facility.

4.1 Radwaste:

The licensee currently dewaters resins in High Integrity Containers (HIC), compacts low level dry active waste, and infrequently solidifies certain wastes. Plant liquid wastes are processed and dewatered using a vendor supplied process. As part of this inspection, the following licensee procedures related to the radwaste program were reviewed:

RP 902, Rev 0, "Radioactive Waste Sampling and Classification"

RP 903, Rev 0, "Use of RADMAN"

RP 904, Rev 1, "Dose Curie Conversion Calculations"

RP 905, Rev 1, "Transfer of Radioactive Waste to SNGS"

RP 906, Rev 0, "Shipment of Radioactive Waste for Burial"

RP 907, Rev 0, "Use of CNSI 8-120A Radioactive Material Shipping Package"

RP 908, Rev 0, "Use, Dewatering and Handling of CNSI 8-120 or Larger Liners"

RP 911, Rev 0, "Use of the NUPAC 14/210 or CNSI 14/215 Radioactive Materials Shipping Package"

At the present time the licensee rents one NUPAC 14/210H Type A shipping container for use in the radwaste program. Documentation was available which demonstrated that the licensee has followed procedures as outlined in the Certificate of Compliance for this cask. As part of this inspection, the records of 4 waste shipments were reviewed to ensure compliance with NRC and Department of Transportation requirements. One of these shipments, #89-01, was

one of five shipments of burnable poison rod assemblies made by the licensee in January and February 1989. Activities in these packages ranged from 8000 to 19000 Curies, and involved the loading of a shipping cask in the spent fuel pool. These documents demonstrated the careful planning and execution of this packaging and shipping campaign conducted by the licensee.

The licensee currently composites samples of resins and filters for the purposes of determining appropriate scaling factors. Isotopic analysis is performed by a vendor laboratory.

4.2 Transportation:

The licensee utilizes a vendor supplied computer code for the purposes of classification of radioactive materials shipments. The licensee also uses this program for the shipment of radioactive wastes generated at the Hope Creek Nuclear Generating Station. Shipments of contaminated laundry are made in conjunction with the Hope Creek Station, and are coordinated by the Radiation Protection Services Manager. As part of this inspection, the following procedures were reviewed:

RP 901, Rev 0, "Receipt and Inspection of Radioactive Material"

RP 909, Rev 1, "Shipment of Radioactive Material Excluding Waste for Burial"

RP 913, Rev 1, "Shipment and Receipt of Laundry"

4.3 Training:

In response to NRC IE Bulletin 79-19, the licensee has developed a comprehensive training program for personnel who perform tasks in the processing and shipment of radwaste. Initial training of employees in Radwaste is contained in training lesson plan No. 45004-LES002-00, which is presented over a three day period, and a series of qualification cards signed by supervisory personnel upon satisfactory completion of assigned tasks. Retraining is conducted annually, utilizing lesson plan No. 49988-LES010-00, and consists of an eight hour classroom presentation.

4.4 Quality Assurance:

The licensee's QA program includes surveillances of selected waste shipments and audits of the waste program. Audit NM-88-005 conducted July 25, 1988 through August 22, 1988 was reviewed and found to be comprehensive in scope and technically accurate, with all identified items promptly addressed and resolved. The licensee has elected to apply its 10 CFR 50, Appendix B Quality Assurance program to the area of transport packages. Quality Assurance Procedure 6-1 requires that contractors supplying transport packages be evaluated on an annual basis. Contrary to this, the licensee has utilized an NRC approved transport package, rented from NUPAC, since 1987, but has only evaluated NUPAC once, in March 1987. This is an apparent violation (50-272/89-10-01; 50-311/89-09-01).

5. Environmental Monitoring:

The Radiological Environmental Monitoring Program (REMP) at the licensee's facility is conducted in cooperation with the Hope Creek Nuclear Generating Station, located immediately north of the Salem Nuclear Generating Station. Program administration is by the Public Service Electric and Gas (PSE&G) Radiation Protection Services Department (RPS). RPS contracts with the PSE&G Research and Testing Laboratory (RTL) for the sampling and analysis of environmental media. In addition, Thermoluminescent Dosimeters are placed by the RTL staff, but are procured from and analyzed by a vendor laboratory.

As part of this inspection, the licensee's 1987 and 1988 REMP reports were reviewed and found to be comprehensive in scope and to properly address any anomalous data. In addition, the following RTL procedures were reviewed:

RTL 1.2.1, Rev 2, "Installation of Thermoluminescent Dosimeters in the Field"

RTL 1.3.3.2, Rev 3, "Radiochemical Analysis in Raw Milk"

RTL 3.2.2, Rev 1, "Quality Control Check for Gamma Counting Systems"

RTL 3.0.1, Rev 0, "Development of Alpha, Beta, and Tritium Control Charts"

The licensee's QA department conducts annual audits of the REMP as part of its Appendix B Technical Specifications audit. In addition, the licensee has conducted an audit of the vendor laboratory, which performs TLD services in support of the REMP. These audits were found to be comprehensive in scope, with all findings addressed in a timely manner.

The RTL laboratory participates in the EPA crosscheck program, splits samples with a second vendor laboratory, and analyzes duplicate samples within the laboratory. Results of these Quality Control analyses performed by the RTL demonstrated that the licensee is capable of making accurate measurements.

Calibration of the meteorological tower instrumentation is the responsibility of the Radiation Protection Services Department. A contractor is utilized for surveillance and calibration of the tower instrumentation, and a second contractor evaluates the meteorological data. At the present time, the licensee performs full channel calibration of the meteorological tower instrumentation every three months, conducts brief monthly calibration verifications, and performs "meteorological parameter behavior checks" every three days.

6. Liquid and Gaseous Effluent Control

6.1 Liquid Effluents Controls

The inspector reviewed the licensee's procedures to determine implementation of the following technical specification (TS) requirements for both units:

o TS 3/4.11.1, "Liquid Effluents"
o TS 6.14, "Offsite Dose Calculation Manual (ODCM)"

The inspector reviewed selected liquid discharge permits to determine compliance with the above requirements. The inspector determined that the licensee was meeting the requirements for sampling and analysis at the frequencies and lower limit of detections established in Table 4.11-1 of the Technical Specification. All reviewed discharge permits required met the above requirements.

The licensee uses a computer program to perform offsite dose assessment in order to demonstrate compliance with TS requirements using ODCM methodology. The inspector performed hand calculations in order to verify the dose assessment using liquid effluent discharge permit number LL-2037. The results are:

		DOSE(mrem)		
Isotope	Activity(uCi/ml)	Total Body	Organ	Performed by
Co-58	1.97E-5	4.95E-5	4.43E-4(GI-LLI)	Licensee
		4.92E-5	4.45E-4(GI-LLI)	NRC
Co-60	4.19E-6	2.95E-5	2.51E-5(GI-LLI)	Licensee
		2.96E-5	2.52E-5(GI-LLI)	NRC
Cs-137	2.79E-6	4.04E-5	6.17E-5(Liver)	Licensee
		4.01E-5	6.20E-5(Liver)	NRC

The comparisons indicate good agreement.

6.2 Gaseous Effluents Controls

The inspector reviewed the licensee's procedures to determine the implementation of the following technical specification (TS) requirements for both units:

o TS 3/4.11.2, "Gaseous Effluents"
o TS 6.14, "Offsite Dose Calculation Manual"

The inspector also reviewed selected gaseous discharge permits to determine compliance with the above TS requirements. The inspector also performed hand calculations in order to verify the licensee's dose assessment using the gaseous discharge permit number DT-2065. The results are:

Isotope	Activity(uCi/ml)	Gamma Dose(mrad)	Beta Dose(mrad)	Performed by
Kr-85	1.45E-4	1.98E-8	2.24E-6	Licensee
		1.97E-8	2.24E-6	NRC
Xe-133	8.73E-4	2.44E-6	7.27E-6	Licensee
		2.44E-6	7.26E-6	NRC

The comparisons indicate good agreement.

The inspector reviewed semiannual radioactive effluent release reports for 1988. These reports provided total released radioactivity for liquid and gaseous effluents including radiation dose to the public.

No violations were identified in the areas of liquid and gaseous effluents control program during this inspection.

6.3 Calibration of Liquid and Gaseous Effluent Monitors

The inspector reviewed the licensee's procedures to determine the implementation of the following technical specification requirements for both units:

o TS 3/4.3.3.8, "Radioactive Liquid Effluent Monitoring Instrumentation"
o TS 3/4.3.3.9, "Radioactive Gaseous Effluent Monitoring Instrumentation"

The inspector reviewed the most recent calibration records for the following monitors for both units:

o Liquid Radwaste Effluent Line Monitor (1,2-R18)
o Steam Generator Blowdown Line Monitors (1,2-R19)
o Containment Fan Coolers-Service Water Line Discharge Monitors (1,2-R13)
o Waste Gas Holdup System Monitors (1,2-R41)
o Containment Purge Gas Monitors (1,2-R12)
o Plant Vent Header System Monitors (1,2-R16)
o Main Steam Line Radiation Monitors (1,2-R46)

Based on the review of the above monitor calibration records, the inspector determined that the calibrations were performed as required by the appropriate procedures and technical specifications.

6.4 Review of Special Reports and Licensee Event Reports

The inspector reviewed three Special Reports (SRs) and eleven Licensee Event Reports (LERs) regarding the radiation monitoring system during this inspection. These fourteen (14) reports were submitted to the NRC in the period of January, 1988 to April, 1989 to meet Section 6.9.2 of Technical Specifications and 10 CFR 50.73 requirements, respectively.

Reviewing the above LERs, the inspector noted that the licensee identified three technical specification violations due to personnel errors and an inadequate administrative control. The inspector reviewed root cause analyses and corrective actions. The corrective actions were additional training, revised procedures, and improved interdepartmental communication. The inspector

verified these corrective actions through discussion with the licensee. These are licensee self-identified Severity Level IV or V violations and in accordance with 10 CFR 2, Appendix C, subparagraph G (Exercise of Discretion) the NRC is not issuing a Notice of Violation due to the corrective actions taken by the licensee.

The inspector also noted that the major root cause of SRs and LERs was equipment failure. The inspector discussed with the licensee the maintenance of the radiation monitoring system. The licensee stated that they established the following short and long term projects for the system:

o Short Term Project; (1) installation of voltage regulators to prevent channel spiking in 1989
(2) installation of a central process unit in 1990

o Long Term Project; (1) replacement of Emergency Safety Feature radiation monitoring systems in 1991

The progress of the projects will be reviewed during subsequent inspections. The inspector also noted that there was no dose impact to the public due to these LERs.

6.5 Air Cleaning System

The inspector reviewed the licensee's technical specification (TS) requirements in the area of air cleaning systems for both units:

o TS 3/4.7.6 "Control Room Emergency Filtration System"
o TS 3/4.7.7 "Auxiliary Building Exhaust Air Filtration System"
O TS 3/4.9.12 "Fuel Handling Area Ventilation System"

The inspector reviewed the following procedures and the most recent surveillance testing results to determine the implementation of the above TS requirements:

o RP 1131 Rev.1 "Ventilation System-Visual Inspection"
o RP 1132 Rev.1 "Ventilation System in-Place Filter Testing (Air Flow Capacity Test)"
o RP 1133 Rev.1 "Ventilation System Pressure Drop Test"
o RP 1134 Rev.1 "Ventilation System in-Place Filter Testing (HEPA Filter Banks)
o RP 1135 Rev.1 "Ventilation System in-Place Filter Testing (Adsorber)
o RP 1137 Rev.1 "Removal of Adsorbent Samples for Laboratory Testing"

During the previous inspection conducted during the week of September 19-23, 1983, a followup item was identified in this area (50-272/83-29-03; 50-311/83-31-03). This inspection report reads in part :

"The inspector examined the auxiliary building air cleaning system and noted that a heater was not a part of the ventilation system. Section 9.4.3.1 of the SGS-FSAR, Revision 0, July 22, 1983, "Design Bases of the Fuel Handling Area

Ventilation", reads in part, 'Although there is no direct control of the humidity in the building, and there can be instances of 100% relative humidity around the spent fuel pool when the outdoor air is damp, the relative humidity under design conditions is expected to be less than 70%'. The inspector noted that the licensee has not measured the relative humidity since the ventilation systems began operation. The inspector reviewed selected licensee Deficiency Reports regarding ventilation systems and LER 83-027/03L. The LER 83-027/03L described a problem in which the fuel handling area ventilation system was inoperable on June 3, 1983, due to the saturation of water vapor in the charcoal adsorber. The inspector stated that the measurement of the moisture content in the ventilation systems should be made periodically to ensure the system integrity for the normal and emergency operations. The actions taken by the licensee to control humidity will be reviewed in a subsequent inspection.

The licensee performed a Safety Evaluation (S-C-M941-MSE-234, Rev.0) to resolve the above followup item. A contractor (MSA Company) performed a charcoal canister test for the methyl iodide penetration at 95% relative humidity as required by Regulatory Guide 1.52. The test method used was as detailed in ASTM D-3803 except that the test sample was exposed to 80 C and to the high humidity condition for two hours (120 minutes) prior to testing. The ASTM D-3803 requires 300 minutes. The penetration results was less than 0.4% and the result was accepted (acceptance criteria = less than 1%). In this Safety Evaluation, the licensee did not measure the moisture content in the ventilation systems as stated in the followup item.

During this inspection, the inspector noted that the laboratory testing results for methyl iodide penetration did not meet the acceptance criteria in the following systems:

o Unit 1 Control Room, May 1986, Penetration ; 3.0%, Failed
Possible Cause ; Unknown

o Unit 2 Control Room, October, 1987, Penetration ; 1.88%, Failed
Possible Cause ; Painting

o Unit 2 Aux. Building, March-April 1989, Penetration ; 30.28%, Failed
Possible Cause ; Unknown

o Unit 2 Fuel Handling Bldg., March-April 1989, Penetration ; 11.8%, Failed
Possible Cause ; Unknown

The charcoal in the above systems were replaced as required by the Technical Specifications. On March 29, 1989, Unit 2 shutdown was required to replace the Auxiliary Building Ventilation System charcoal filter adsorber bank (LER 89-006). The visual inspections for the fuel handling building and the auxiliary building identified some problems such as: 1) minor corrosion problem, 2) dampers are not leak tight, and 3) no seal installed for fan-shaft seal.

The licensee stated that the air balance test for the systems will be performed in the near future as the short term project. Based on the air balance testing, the licensee will determine the long term project. The relative humidity in the systems will be measured to verify the SGS-UFAR commitments (70% relative humidity). The inspector requested to the licensee to send those test results to the NRC for review as soon as possible. Based on the above findings, this is an unresolved item pending results of above tests. (50-272/89-10-02; 50-311/89-09-01).

7. Exit Interview:

The inspector met with licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on April 7, 1989. The inspector summarized the purpose and scope of the inspection, and discussed the findings. At no time during this inspection was written material provided to the licensee by the inspector.