U. S. NUCLEAR REGULATORY COMMISSION

REGION I

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Report Nos. 50-272/86-04
50-311/86-04

Docket Nos. 50-272
50-311

License Nos. DPR-70
DPR-75

Licensee: Public Service Electric and Gas Company

80 Park Plaza

Newark, New Jersey 07101

Facility Name: Salem Nuclear Generating Station - Units 1 and 2

Inspection At: Hancocks Bridge, New Jersey

Inspection Conducted: February 1, 1986 - February 28, 1986

Inspectors: T. J. Kenny, Senior Resident Inspector
B. M. Hillman, Reactor Engineer

Reviewed by: _____ 3.17.86
D. F. Limroth, Project Engineer date
Reactor Projects Section No. 2B, DRP

Approved by: _____ 3/17/86
L. J. Norrholm, Chief, Reactor Projects date
Section No. 2B, Projects Branch No. 2, DRP

Inspection Summary:
Inspections on February 1, 1986 - February 28, 1986 (Combined Report Numbers 50-272/86-04 and 50-311/86-04)

Areas Inspected: Routine inspections of plant operations including: followup on outstanding inspection items, operational safety verification, maintenance, surveillance, review of special reports, licensee event followup, and manual reactor trip switch circuit location. The inspection involved 80 inspector hours by the resident NRC inspector and 21 hours by region based inspectors.

Results: No violations are identified in this report.

DETAILS

1. Persons Contacted

Within this report period, interviews and discussions were conducted with members of licensee management and staff as necessary to support inspection activity.

2. Followup on Outstanding Inspection Items

(Closed) Inspector Follow Item (272/83-25-04; 311/83-26-04). This item was opened following the failure of a reactor trip breaker (RTB) to close remotely. The licensee determined the failure was due to improper cell interlock contact with the RTB trip bar. New rail/latch assemblies have been installed in all RTB and applicable surveillance and maintenance procedures have been revised. No incident of this nature has occurred since the addition of the new assemblies. This item is closed.

(Open) Unresolved Item (50-272/83-37-11). In a letter from the licensee to Region I dated April 4, 1984, the licensee proposed a solution to an unresolved item which was generated in Inspection Report 50-272/83-37. The item was: "The emergency equipment operating procedures for connecting a T hot and T cold instrument requires running wire to containment penetrations and splicing into the RTD cables at the penetrations. The NRC considers these instruments necessary for hot shutdown. The team concluded that the procedures are unacceptable since they require repairs. The licensee proposed modifications to the shutdown panel to include direct readings for T hot and T cold without the need for repairs. This item is unresolved pending licensee actions to implement such modification."

The proposed solution was: "The reactor T hot and T cold indications will be modified to assure availability without repairs from the remote shutdown panel. This modification will be installed during the sixth refueling outage."

Region I has recently received a letter dated February 4, 1986 which states: "Due to resources not now being available, this modification will be installed during the seventh refueling outage for Unit 1. This same modification will also be installed during the fourth refueling outage for Unit 2. In the meantime, we will continue to use the emergency equipment operating procedures for achieving hot shutdown." This item remains open pending installation of the T hot and T cold wiring.

(Closed) Inspector Follow Item (272/84-04-02). This item was opened following concerns raised by licensee operators with regard to their liability when directions issued by their management appear to be in conflict with Technical Specifications. The licensee has included a lecture on the topic in its operator training and retraining program. The lecture now clearly gives the operator the proper guidance when dealing with

orders from management which appear to be in conflict with Technical Specifications. This item is considered closed.

(Closed) Inspector Follow Item (272/84-13-08). This item was opened as a result of the licensee's failure to include provisions for second verification of temporary jumpers and lifted leads in Administrative Procedure #13 as required by item I.C.6 of NUREG-0737. The licensee has revised Administrative Procedure #13 to include the second person verification for temporary jumpers and lifted leads. This item is considered closed.

(Closed) Inspector Follow Item (272/84-23-02; 311/84-23-01). This item was opened due to the failure of three throttle valves in the safety injection systems as reported in Licensee Event Report 84-012-00. The licensee's safety analysis has determined the valve design was incapable of sustaining the high differential pressure resulting from extreme throttling action. The licensee has replaced the valves with a valve of acceptable design. This item is considered closed.

(Closed) Inspector Follow Item (272/84-23-04). This item was opened to review the disposition of loss of radiological controls report 84-116. This report involved an incident where a health physics technician improperly entered the source locker room without dosimetry and without signing the appropriate radiation exposure permit. The licensee disciplined the worker. Management has stressed, to all employees, through the training program the necessity for verbatim compliance with procedures. The inspector considers this item closed.

(Closed) Inspector Follow Item (272/84-36-05; 311/84-35-02). This item was opened to follow the licensee's efforts to correct boric acid leaks. The licensee now assigns a priority "B" to all work orders associated with boric acid leakage. Priority "B" work orders, under the current maintenance program, must be addressed within 48 hours. This item is closed.

(Closed) Inspector Follow Item (272/84-42-07). This item was opened to follow licensee's actions to identify the root cause of an EHC problem that resulted in reactor trips on November 6 and 9, 1984. Various suspected EHC system circuit cards were replaced and the system was placed back in service. Since the replacement of the circuit cards, the unit has operated without EHC problems. The inspector considers this item closed.

(Closed) Inspector Follow Item (272/84-47-02). This item was opened due to concerns over debris from maintenance activities in areas of safety related equipment. Since this incident, the licensee has implemented an aggressive housekeeping policy with increased management involvement and employee training. Based upon recent resident inspector observations, the licensee's program has been effective in preventing a recurrence of this type of incident. This item is closed.

(Closed) Violation (272/84-47-03; 311/84-47-03). Failure to follow administrative procedure for control of maintenance activities. As a result of this violation the licensee conducts daily department meetings to

formalize a list of maintenance activities for the day. This list is then furnished to the shift supervisor to insure shift personnel are aware of maintenance activities. The inspector has not identified any incidents of this nature since and considers this item closed.

(Closed) Unresolved Item (311/82-19-02). This item was unresolved pending the licensee's issuance of a supplemental LER report determining the cause of the premature actuation of main steam safety valve 23MS15. The inspector reviewed the licensee's supplemental report (reference: LER 82-059/03X-1, dated January 15, 1986) which stated that the cause of the actuation was the failure of the spindle nut cotter pin. The failure permitted the spindle nut to move up the spindle, thus lowering the lift setting of the valve. The licensee removed the spindle nut cotter pin, spindle nut, forked lever and manual lifting lever from the safety valves to prevent the problem from recurring. The inspector verified that this modification had been performed on the safety valves of the main steam line for #24 steam generator. This item is closed.

(Closed) Unresolved Item (311/83-37-02). This item was opened to review a supplemental report on LER 83-63/03L which described the failure of 2C emergency diesel generator to accelerate to full speed during a surveillance test. The inspector reviewed the report, dated January 15, 1983, which stated that the cause of the failure could not be determined. Further testing of the diesel generator failed to duplicate the sequence of events that led to the failure. No similar failures could be identified since that incident. As a result of the failure the licensee increased the frequency of diesel generator testing to once every 7 days in accordance with Regulatory Guide 1.108 and Technical Specification 4.8.1.1.2. The inspector considers this item closed.

(Closed) Inspector Follow Item (311/84-13-02). This item was opened to follow the development and implementation of a valve position tracking system. The system, now in operation, tracks the position of all valves out of their normal position. Using the system, central control room operators can ascertain the current system valve lineup, with a concurrent report for the reasons when out-of-normal position are required for the off normal valves. The inspector considers this item closed.

(Closed) Unresolved Item (311/84-15-03). This item involved the failure of the licensee to enter Technical Specification action statement 3.5.4.1 on the Boron Injection Tank (BIT) when the BIT recirculation inlet valve, 2SJ108, was temporarily isolated to permit repairs on a leaking valve downstream. The inspector reviewed the licensee's incident report 84-061 as well as an engineering analysis of the occurrence. No violations or unresolved safety issues were noted. The inspector considers this item closed.

(Closed) Inspector Follow Item (311/84-23-06). This item was opened following concerns over the licensee's fuel position verification process. The licensee was relying on video tapes taken of the core for this task. However, video tape quality and water clarity conditions sometimes

prevents clear identification of fuel assembly numbers, thereby requiring engineers to refer to the core map to assist in the identification. Since the resolution on the fuel handling video screen is better than the video tape, the licensee's fuel position procedure now requires engineers to perform position verification from the fuel handling bridge. This item is considered closed.

(Closed) Unresolved Item (311/84-32-02). This item was unresolved pending a review of changes to Operating Instruction (O.I.) II-8.3.2 (Spent Fuel Pit Cooling System Operation) and Surveillance Procedure SP(O)4.7.3.1 (Component Cooling System Thirty-One Day Surveillance) which were corrective actions for LER 84-20. The LER described a missed surveillance test on a normally locked component cooling system valve due to a procedure discrepancy. The inspector verified that the noted procedures were changed to correct the discrepancy. This item is closed.

(Closed) IE Bulletin (84-03). The inspector has reviewed the following correspondence with regard to the reactor cavity seal;

- Bulletin 84-03 Refueling Cavity Water Seal dated August 24, 1984
- Licensee's Response to the Bulletin dated November 15, 1984
- Region I letter for information dated December 12, 1984
- Licensee's Response dated December 17, 1984
- Licensee's Submittals dated December 19, 1984, December 11, 1985 and January 30, 1986
- Independent Evaluations and Testing performed by an independent laboratory
- Temporary Instruction 2515/66

The inspector concluded that the licensee has complied with the above bulletin and has answered the questions presented in the Region I letter. The licensee has a program in place which includes procedures, precautions within existing procedures, and measures to ensure the integrity of the type of reactor cavity seal used at Salem Units 1 and 2. The inspector has no further questions at this time.

3. Operational Safety Verification

3.1 Documents Reviewed

- Selected Operators' Logs
- Senior Shift Supervisor's (SSS) Log
- Jumper Log
- Radioactive Waste Release Permits (liquid & gaseous)

- Selected Radiation Exposure Permits (REP)
- Selected Chemistry Logs
- Selected Tagouts
- Health Physics Watch Log

3.2 The inspector conducted routine entries into the protected areas of the plants, including the control rooms, Auxiliary Building, fuel buildings, and containments (when access is possible). During the inspection activities, discussions were held with operators, technicians (HP & I&C), mechanics, supervisors, and plant management. The purpose of the inspection was to affirm the licensee's commitments and compliance with 10 CFR, Technical Specifications, and Administrative Procedures.

(1) On a daily basis, particular attention was directed to the following areas:

- Instrumentation and recorder traces for abnormalities;
- Adherence to LCO's directly observable from the control room;
- Proper control room shift manning and access control;
- Verification of the status of control room annunciators that are in alarm;
- Proper use of procedures;
- Review of logs to obtain plant conditions; and,
- Verification of surveillance testing for timely completion.

(2) On a weekly basis, the inspector confirmed the operability of selected ESF trains by:

- Verifying that accessible valves in the flow path were in the correct positions;
- Verifying that power supplies and breakers were in the correct positions;
- Verifying that de-energized portions of these systems were de-energized as identified by Technical Specifications;
- Visually inspecting major components for leakage, lubrication, vibration, cooling water supply, and general operating conditions; and,
- Visually inspecting instrumentation, where possible, for proper operability.

(3) On a biweekly basis, the inspector:

- Verified the correct application of a tagout to a safety-related system;
- Observed a shift turnover;
- Reviewed the sampling program including the liquid and gaseous effluents;
- Verified that radiation protection and controls were properly established;
- Verified that the physical security plan was being implemented;
- Reviewed licensee-identified problem areas; and,
- Verified selected portions of containment isolation lineup.

3.3 Inspector Comments/Findings:

The inspector selected phases of the units' operation to determine compliance with the NRC's regulations. The inspector determined that the areas inspected and the licensee's actions did not constitute a health and safety hazard to the public or plant personnel. The following are noteworthy areas the inspector researched in depth:

1. Unit 1

a. Unit 1 began this report period in Mode 3 with the licensee performing selected work orders.

- After repairs were made, including the replacement of the faulty solenoid valves in the control circuits of #11 feed regulation valve, at 9:54 p.m. on February 2, 1986, the unit returned to service.
- At approximately 3:00 p.m. on February 4, 1986, the licensee identified a leak on the lube oil regulating valve to #4 bearing of the main turbine. (The oil leak was being contained in the turbine building.) Following unsuccessful attempts to repair the leak while operating, the licensee took the turbine off line at 8:19 p.m. The plant was maintained in Mode 2 while the leak was repaired. The turbine was relatched at 7:50 a.m. on February 5. The reduction in power necessitated by the lube oil leak was reported to State of New Jersey as required.

About the same time, the licensee reported an oil sheen on the river to the state. This oil apparently came from the truck unloading station for diesel fuel oil. It is suspected that a bucket of oil catchings which overflowed from rainwater plus other residual fuel oil on the pad, aided by heavy rainfall, was the source of the oil slick on the river.

The two reports were apparently linked by the State of New Jersey into the mistaken belief that the turbine lube oil leak (about 3000 gallons) was the source of the oil in the river.

The licensee cleaned up the fuel oil spill. The lube oil contained in the turbine building sump was subsequently removed by tanker truck from the site.

- At 1:42 a.m. on February 20, 1986, the reactor tripped from 100% power due to #14 Steam Generator feed flow and level low. The cause of the trip was a broken lead at the "stak-on" connection to the "B" train solenoid valve, which resulted in the loss of air to 14BF19 (feed regulation valve). The licensee replaced the "stak-on" connections to the solenoid valves of all four feed regulation valves because it was suspected that failure was due to work hardening of the connection from heat and vibration.

  The unit was returned to power at 5:18 p.m. on February 21, 1986, following the feed regulation valve repairs. The unit is currently restricted in power to approximately 95% because of #3 governor valve being tagged closed. During testing of the turbine during startup, the licensee identified that #3 and 4 turbine stop valves would not fully close. Subsequent tests identified that #4 stop valve would not close due to hydraulic problems in the EHC system which have been repaired. However, mechanical binding was the cause of #3 stop valve not going fully closed. Although not required by Unit 1 Technical Specifications, the licensee nevertheless recognized the need for overspeed protection on the turbine and exercised an option from Unit 2 Technical Specifications which allows the closure of #3 governor valve thus isolating that steam supply to the turbine. This method of operation still incorporates the overspeed protection to the turbine. This report period ended with the unit at 97% power.

2. Unit 2

a. Unit 2 operated at 100% power throughout this period except for minor power alterations for testing.

- At 4:45 p.m. on February 10, 1986, a pre-lube heater oil leak on 2B diesel generator rendered the unit inoperable. Since #23 and 24 service water pumps are supplied by the affected "B" vital bus, they were declared inoperable. No. 22 and 26 service water pump were already inoperable at the time, resulting in a Technical Specification required shutdown within 6 hours. The shutdown action statement was terminated at 5:15 p.m. on February 10, 1986 when #22 service water pump was returned to service. Repairs to the diesel generator continued under the applicable 72 hour action statement. At 4:00 p.m. on February 11, 1986, the 2B diesel completed testing and was returned to service.

3. The inspector conducted several walkdowns of the Control Board Annunciators within the control rooms. The inspector quizzed the operators as to the validity of each lighted annunciator. In every case the operators could identify the reason for the alarm, what corrective actions were currently being processed to correct the cause of the alarm and, in several cases, identified design change requests that had been submitted. The inspector determined that the licensee is taking appropriate actions to correct the cause of annunciator alarms.

No violations were identified.

4. Maintenance Observations

The inspector reviewed the following safety related maintenance activities to verify that repairs were made in accordance with approved procedures and in compliance with NRC regulations and recognized codes and standards. The inspector also verified that the replacement parts and quality control utilized on the repairs were in compliance with the licensee's QA program.

Work Order Number	Maintenance Procedure	Description
86-01-30-001-4	SP.405P (Retest) A11-1 (MGE) "Charging Pump Repair"	Replacement of plunger and repacking of cylinder of Charging Pump #13.

86-01-09-041-9	A11-1 (MP 7.2) "ITT Grinnell diaphragm valve preventative maintenance"	Replacement of diaphragm and "O" rings in 13SW014 valve.
86-01-23-057-1	A11-1 (M3M) "Surveillance Testing and Preventative Maintenance of Station Batteries"	Perform weekly inspection and Preventative Maintenance on Station Batteries, including addition of water and Battery gravities.
86-02-04-020-2 86-01-28-090-1 86-01-28-092-2	A11-1 (M3Q5) "230/460V ITE K225 and K600 Circuit Breaker Periodic Maintenance"	Perform 460V Breaker Maintenance Check as per Technical Specification 3.8.3.1.
85-09-13-061-2 85-09-13-058-2 85-09-13-045-7 85-09-13-036-1 85-08-10-053-5 85-09-10-055-1 85-09-10-059-4 85-09-10-062-4 85-09-11-030-1 85-09-10-064-1 85-09-10-051-9 85-09-10-048-9		Replace HFA relay IAW Field Directive S-C-E000-EFD-0317

The licensee's field directive S-C-E000-EFD-0317 directed the alteration of General Electric HFA Relays containing nylon or lexan spools, by replacement, with Tefzel spools, as per Bulletin 84-02. The above work orders replace the spools in various switchboards throughout the units.

No violations were identified.

5. Surveillance Observations

During this inspection period, the inspector reviewed in-progress surveillance testing as well as completed surveillance packages. The inspector verified that the surveillances were performed in accordance with licensee approved procedures and NRC regulations. The inspector also verified that the instruments used were within calibration tolerances and that qualified technicians performed the surveillances.

The following surveillances were reviewed:

Unit 1

SP(0)4.8.1.1.1a	"Electrical Power System - Alignment", which verifies the correct alignment of offsite and onsite power systems including vital busses.
SP(0)4.9.12a	"Fuel Building Ventilation", which verifies the ventilation in the fuel building in accordance with Technical Specification.
SP(0)Special-1	"Special tests conducted on valves listed in LER 86-002

Unit 2

SP(0)4.2.1.1	"Power Distribution Axial Flux Differential", which records Axial Flux Differential at 100% power.
SP(0)4.4.7.2d	"Reactor Coolant System - Water Inventory Balance"
SP(0)4.8.1.1.2	"Electrical Power Distribution Systems - Emergency Diesels", which verifies operability of three diesel generators for 60 minutes.
SP(0)Special-1	"Special tests conducted on valves listed in LER 86-002

No violations were identified.

6. Review of Periodic and Special Reports

Upon receipt, the inspector reviewed periodic and special reports. The review included the following: inclusion of information required by the NRC; test results and/or supporting information consistent with design predictions and performance specifications; planned corrective action for resolution of problems, and reportability and validity of report information. The following periodic reports were reviewed:

- Unit 1 Monthly Operating Report - January 1986
- Unit 2 Monthly Operating Report - January 1986

In addition, the inspector reviewed Special Report 86-02 and 86-03.

- 86-02 dated February 14, 1986, is a 30-day report required by Technical Specification Action Statement 3.3.3.6.b which states:

  "Restore the inoperable instrument(s) to operable status within fourteen (14) days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next thirty (30) days

outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the instrument(s) to operable status."

This report was submitted because fire detection instruments on #22 reactor coolant pump were inoperable for more than 14 days. (January 5 - January 19) These instruments are not accessible during power operation and the licensee used alternate means to monitor the area for overheating and fire. The instruments were restored to service after the contacts were cleaned and tested. One of the detectors has been scheduled for replacement during the next outage of sufficient duration.

- 86-03 dated February 28, 1986, is a 30-day report required by Technical Specification Action Statement 3.4.10.3.c which states:

  "In the event that either the POP's or the RCS vents are used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within thirty (30) days. The report shall describe the circumstances initiating the transient, the effect of the POPS's or vents on the transient and any corrective action necessary to prevent recurrence."

  While Unit 2 was in cold shutdown (Mode 5) with reactor coolant system filling and venting in progress, the pressure was being raised to 325 psig utilizing #21 and 23 Charging Pumps when one of the pressurizer relief valves lifted for three seconds at 355 psig. This event was attributed to operator error. The operator did not shut down the centrifugal pump (#21) soon enough after starting the positive displacement pump (#23). The operator has been counseled and the incident is being reviewed by the Training Department to determine the need for additional training in the operator retraining program.

No violations were identified.

7. Licensee Event Report Followup

The inspector reviewed the following LERs to determine that reportability requirements were fulfilled, immediate corrective action was taken, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

Unit 1

86-01 Reactor Trip

This event was discussed in Combined Inspection Report 50-272/86-01, 50-311/86-01. The inspector has no further questions at this time.

86-02 Failure to Implement Portions of the Inservice Testing Program

This report delineates the failure of licensee management to maintain the inservice testing program (IST) in accordance with their submittals to the NRC and Section XI of the ASME Boiler and Pressure Vessel Code. As a result of the review by the licensee, testing was conducted and additional testing has been scheduled for the upcoming outage on Unit 1 and the next time Unit 2 is in Mode 3 and Mode 5. The licensee has also committed to follow up and modify the procedure, programmatic, training, and Quality Assurance deficiencies noted within the LER. The inspector will follow this program to its completion (50-272/84-04-01).

The inspector reviewed the results of the testing and x-raying performed to date. The findings are as stated in the LER.

86-03 Reactor Trip

This event was discussed in Combined Inspection Report 50-272/86-01, 50-311/86-01. The inspector has no further questions at this time.

No violations were identified.

8. Manual Reactor Trip Switch Circuit Location

Information Notice No. 85-18 identified that, in the design of Westinghouse Solid State Protection System, a failure (short circuit) of the output transistors 03 and 04 would prevent an automatic reactor trip. Also, drawings existed at some facilities that delineated the location of the manual trip to be upstream of these transistors. In these cases, if the transistors short circuited the manual trip would have been ineffective.

An inspection was conducted to determine if the licensee's drawings depicted the actual location of the manual trip circuit. The inspector determined that the manual trip circuits are located downstream of the output transistors 03 and 04 in the undervoltage (UV) output circuit. The licensee has addressed the possible loss of the automatic reactor trip question by performing functional testing of the entire solid state protection system after performing individual circuit testing, within the solid state protection system, prior to returning the system to service. The inspector has no further questions on this issue at this time.

9. Exit Interview

At periodic intervals during the course of the inspection, meetings were held with senior facility management to discuss the inspection scope and findings. An exit interview was held with licensee management at the end of the reporting period. The licensee did not identify 2.790 material.