

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report Nos. 50-272/79-18
50-311/79-31

Docket Nos. 50-272
50-311

License Nos. DPR-70
CPPR-53

Priority: --

Categories: C, B1

Licensee: Public Service Electric and Gas Company
80 Park Place
Newark, New Jersey 07101

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

Inspection at: Hancocks Bridge, New Jersey

Inspection conducted: May 26 - June 30, 1979

Inspectors:

L. J. Norrholm for
L. J. Norrholm, Resident Inspector

8/24/79
date signed

J. C. Higgins for
J. C. Higgins, Reactor Inspector

8/23/79
date signed

Approved by:

R. R. Keinig
R. R. Keinig, Chief, Reactor Projects
Section No. 1, RO&NS Branch

8/23/79
date signed

Inspection Summary:

Inspections on May 26 - June 23, 1979 (Combined Inspection Report Nos. 50-272/79-18 and 50-311/79-31)

Unit 1 Areas Inspected: Routine inspections of plant operations including: tours of the facility; log and record reviews; review of licensee events; organization and administration; on-site and off-site review committees; IE Bulletins and Circulars; and followup on previous inspection items. The inspection involved 53 inspector-hours by the resident inspector and 25 inspector-hours by one regional based inspector.
Unit 2 Areas Inspected: Routine inspections of plant preoperational testing including: Tours of the facility; followup on previous inspection

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items; and, preparedness for an operating license. The inspection involved 9 inspector-hours by the NRC resident inspector and 7 inspector-hours by one regional based inspector.

Results: One item of noncompliance was identified in one area (Infraction Unit 1 - Failure to maintain operable spray/sprinkler system for No. 13 RCP - Paragraph 4d).

DETAILS

1. Persons Contacted

PSE&G

C. Johnson, Startup Engineer
S. LaBruna, Maintenance Engineer
E. Meyer, Project QA Engineer
H. Midura, Manager - Salem Generating Station
L. Miller - Performance Engineer
W. Reuther, Site QAD
F. Schnarr, Station Operating Engineer
R. Silverio, Assistant to the Manager
J. Stillman, Station QA Engineer
J. Zupko, Chief Engineer

The inspector also interviewed other licensee personnel during the course of the inspections including management, clerical, maintenance, operations, performance, quality assurance, testing, and construction personnel.

2. Status of Previous Inspection Items

(Closed) Follow Item (272/78-03-03) Duplicate storage of design change records. The inspector reviewed completed documentation relating to six completed design changes and verified that duplicate records existed at the station and in the corporate offices. The inspector had no further questions on this item.

(Closed) Unresolved Item (311/79-30-02) SORC review of refueling procedure I-2 and issue of Fire Protection Manual, Revision 3. Procedure I-2 was reviewed and approved by SORC on May 7, 1979. The Fire Protection Manual revision was approved and issued on June 1, 1979. The inspector had no further questions on this item.

(Closed) Unresolved Item (311/79-30-04) SORC review of Operating Instruction III-1.3.3, Turbine Valve Test. The procedure was reviewed and approved by SORC on May 8, 1979. The inspector had no further questions.

Unit 1

3. Plant Tour

a. During the course of the inspections, including backshifts, the inspector made observations and conducted tours of:

- Control Room;
- Relay Room;
- Auxiliary Building;
- Vital Switchgear Room;
- Containment;
- Fuel Handling Building;
- Yard Areas;
- Rad Waste Building;
- Site Perimeter;
- Penetration Areas;
- Control Point; and,
- Turbine Building.

b. The following determinations were made:

- Logs. A sampling review of station operating logs was made to verify compliance with procedures and to verify that operating parameters were within Technical Specification limits.
- Monitoring instrumentation. The inspector frequently verified that selected instruments were functional and that demonstrated parameters were within Technical Specification limits.
- Valve Positions. The inspector verified that selected valves were in the position or condition required by the Technical Specifications for the applicable plant mode.
- Radiation Controls. The inspector verified by observation that control point procedures and posting requirements were being followed. The inspector identified no failures to properly post radiation and high radiation areas.
- Plant housekeeping conditions. Observations relative to plant housekeeping and fire hazards identified no unsatisfactory conditions.

- Fluid leaks. No fluid leaks were observed which had not been identified by station personnel and for which corrective action had not been initiated, as necessary.
 - Piping vibration. No excessive piping vibrations were observed and no adverse conditions were noted.
 - Selected pipe hangers and seismic restraints were observed and no adverse conditions were noted.
 - Control Room annunciators. Selected lit annunciators were discussed with control room operators to verify that the reasons for the alarmed conditions were understood and corrective action, if required, was being taken.
 - By frequent observations during the inspections, the inspector verified that the control room manning requirements of 10 CFR 50.54(k) and the Technical Specifications were being met. In addition, the inspector observed that frequent tours were made by shift supervision.
- c. The following acceptance criteria were used for the above items.
- Technical Specifications
 - Operations Directives Manual
 - Inspector Judgment

4. Shift Logs and Operating Records

- a. The inspector reviewed the following plant procedures to determine the licensee established requirements in this area in preparation for a review of selected logs and records.
- AP-5, Operating Practices, Revision 9, April 23, 1979
 - Operations Directive Manual
 - AP-13, Control of Lifted Leads and Jumpers, February 22, 1979
 - AP-15, Tagging Rules, Revision 0, April 13, 1976

The inspector had no questions in this area.

- b. Shift Logs and operating records were reviewed to verify that:
 - Control Room log sheet entries are filled out and initialed;
 - Auxiliary log sheets are filled out and initialed;
 - Log entries involving abnormal conditions provide sufficient detail to communicate equipment status, lockout status, correction, and restoration;
 - Log Book reviews are being conducted by the staff;
 - Operating orders do not conflict with Technical Specification requirements;
 - "Plant Information Records" confirm there are no violations of Technical Specification reporting or LCO requirements; and,
 - Logs and records were maintained in accordance with Technical Specifications and the procedures in 4.a above.

- c. The review included discussions with licensee personnel and the following plant shift logs and operating records for the intervals indicated:
 - Log No. 1 - Control Room Daily Log, May 30-31, June 3, 9, 13, 17, 23, 24, 27, 1979
 - Log No. 3 - Control Console Reading Sheet, May 30-31, June 3, 9, 13, 17, 23, 24, 27, 1979
 - Temporary Jumper and Lifted Lead Log - all active

- d. During the review of lifted lead and jumper controls, the inspector evaluated the adequacy of procedural controls, reviewed the current Jumper Sheets for completeness, noted that the required Shift Supervisor audits had been performed, observed that the actual jumper installed corresponded to the documentation, and reviewed selected jumpers to determine the reasons for, and the effects of, their installation. With the exception of the following item, the inspector had no further questions in this area.

The inspector noted that:

- (1) There was no indication on the sheet as to whether the jumper or system involved affected a Technical Specification Limiting Condition for Operation;
- (2) The jumper sheets did not always clearly state the reason for the installation of the jumper; and,
- (3) The jumper sheets did not indicate the conditions necessary for removal of the jumper or when the jumper must be removed.

The licensee stated that the above items will be resolved in a procedure revision to be made by October 1, 1979. These items are considered unresolved and are designated as 272/79-18-02.

During the review of installed jumpers, the inspector noted that the low air pressure alarm for the deluge valve (IFP 226) to No. 13 Reactor Coolant Pump (RCP) Lube Oil System had been jumpered since October 23, 1978. This was done to clear the alarm and allow any other alarms received to be annunciated. The alarm was received due to disassembly and maintenance in the area while replacing No. 13 RCP seal package. When the RCP seal replacement was completed, the fire system jumper was not removed. Subsequent power operation took place periodically between November 13, 1978 to April 3, 1979. The normal method of spray/sprinkler system operation for the Containment Building is with the header or containment isolation valve (IFP 147) shut. When a fire condition exists, the local deluge valve opens and a low air pressure alarm is received. The operator then manually opens IFP 147 to admit water to the sprinkler. With the alarm jumpered, the spray/sprinkler system for No. 13 RCP Lube Oil System was inoperable. This is contrary to Technical Specification 3.7.10.2 and is an apparent Item of Noncompliance at the infraction level (272/79-18-01).

5. Organization and Administration

- a. The licensee's organization and administration was reviewed to verify that:
 - The licensee's onsite organization structure is as described in the Technical Specifications.
 - Personnel qualification levels are in conformance with applicable codes and standards.

- Authorities and responsibilities of licensee personnel are as delineated in the Technical Specifications and applicable standards.
- Organizational changes are consistent with Technical Specification requirements.

The review included discussions with licensee personnel and review of Technical Specifications and the following standards, plant procedures and records:

- ANSI N18.1, 1971, "Selection and Training of Nuclear Power Plant Personnel."
- ANSI N18.7, 1976, "Administrative Controls for Nuclear Power Plants."
- AP-2, Station Organization, Rev. 2, April 18, 1979.
- AP-5, Operating Practices, Rev. 9, April 23, 1979.
- Resumes of Station Management and Supervisory Personnel.

b. Management changes were made at the station, effective June 25, 1979. Although not required by facility Technical Specifications, these changes were reported verbally to the inspector prior to implementation. The inspector evaluated qualification levels of the new selectees in the following positions:

- Station Operating Engineer
- Senior Performance Supervisor - I&C

c. The inspector noted that the newly designated Station Operating Engineer does not appear to meet the training and experience requirements of ANSI N18.1 for Operating Manager, however, the Chief Engineer does. Additionally, the incumbent Operating Engineer will continue to serve in a parallel capacity while the new appointee gains the requisite experience and license.

The new Senior Performance Supervisor - I&C - had not been named. The individual acting in this capacity meets the requirements for Instrumentation and Control Supervisor (not requiring a license) as stated in ANSI N18.1.

No other changes in station principal staff have been made since the previous inspection.

The inspector had no further questions in this area.

6. SORC and NRB Review Functions

a. The Station Operations Review Committee (SORC) and Nuclear Review Board (NRB) review functions were reviewed to verify that:

- All SORC and NRB meetings convened during the period reviewed were held at the frequency required by the Technical Specifications.
- The meeting membership of the SORC and NRB meetings convened satisfied the quorum requirements of the Technical Specifications.
- Proposed tests and experiments which affect nuclear safety or whose performance may constitute an unreviewed safety question were reviewed as required by the Technical Specifications.
- Noncompliances with Technical Specifications or rules and regulations were reviewed as required by the Technical Specifications.
- Proposed changes to Technical Specifications were reviewed as required by the Technical Specifications.

The review included discussions with licensee personnel and review of Technical Specifications and the following procedures and records.

- NRB Charter, Revision 4, February 2, 1978.
- NRB Procedure 1, Procedures for Maintaining Official Files, Revision 4, April 2, 1979.
- NRB Procedure 2, Review Practices, Revision 3, April 2, 1979.
- NRB Procedure 3, Administration of Audit Program, Revision 1, February 10, 1978.
- NRB Procedure 4, Closeout of Meeting Open Items, Revision 0, May 15, 1978.
- Minutes of NRB Meetings 78-5 through 79-8, May 4, 1978 -May 9, 1979.
- AP-4, Station Operations Review Committee, Revision 5, May 4, 1978.

-- Minutes of SORC Meetings 55-78 through 80-78, 1-79 through 5-79 and 7-79 through 11-79.

- b. The inspector noted that the NRB Charter was not consistent with the facility Technical Specifications relative to the identification of Board members and the audit responsibility of the Board. Subsequent review of the minutes demonstrated that the membership and audit areas addressed were in agreement with the Technical Specifications. This item is unresolved pending revision to the NRB Charter (272/79-18-05).
- c. Preselected License Change Requests, Licensee Event Reports identifying violations of the license, Design Change Requests, and SORC minutes were verified as having been reviewed by the appropriate committee. NRB review of completed design changes is accomplished by review of the appended material forwarded with SORC minutes which are also required to be reviewed by the Board. The inspector noted that SORC minutes were routinely 4 months late in being prepared and forwarded to the Board for review. To reduce this unacceptable delay, the licensee stated that SORC minutes will be prepared and published for review within 15 days of the meeting, and this time limit will be reflected in a revision to AP-4, to be made by October 1, 1979. This item is unresolved pending revision to AP-4 (272/79-18-04).
- d. Both the NRB and SORC are required by Technical Specifications to review violations of Technical Specifications. This includes those items of noncompliance identified in NRC Inspection Reports. The mechanism for review has been to review the company response to those items. For each committee, the inspector identified two or more inspection reports with cited items of noncompliance which were not specifically reviewed. The reason appears to be related to the fact that the items did not require a written response to NRC. In each case, the inspector verified through review of minutes that the individual items themselves were reviewed in the course of other business.
- e. The inspector noted that IE Bulletins and Circulars were no longer reviewed by the NRB as a matter of routine. Technical Specification 6.5.2.7.h requires the NRB to review all recognized indications of an unanticipated deficiency in some aspect of design or operation of safety related structures, systems, or components. No failure to review corrective action resulting from a Bulletin or Circular was identified by the inspector. This area will be reviewed further in a subsequent inspection (272/79-18-06).

The inspector had no further questions in this area.

7. Local Leak Rate Testing (LLRT)

The inspector reviewed the test results from the licensee's LLRT or Type C Testing program for the current refueling outage. The inspector noted that five valves had leaked sufficiently that test pressure could not be maintained. This indicated that leakage was in excess of the Technical Specification limit of 0.60 La. The inspector further noted that the licensee's system of incident reporting did not identify this as a reportable occurrence. The licensee's representative stated that this item would be reported and that the incident reporting system would be reviewed with personnel involved. This area will receive further NRC review in a subsequent inspection (272/79-18-03).

8. Other Items

a. As a result of damage observed to fuel assembly grid straps, the licensee modified fuel loading procedures to include the following:

- Close monitoring of the load cell on removal and insertion to detect contact or "hanging-up" of the fuel assembly.
- Loading sequence to avoid corner to corner interactions involving already damaged assemblies.
- Reuse of spent assemblies only if damage is such that support of peripheral fuel pins still exists.
- Lowering fuel assemblies as far as practicable in a position offset from the core location such that contact with adjacent assemblies occurs only on the last few inches of motion.

The inspector verified that the above considerations were incorporated into refueling procedures, and witnessed the insertion of several fuel assemblies, noting that the stated considerations were being applied. At the conclusion of the inspection, the entire core had been loaded.

b. On May 29, 1979, while changing the Rod Control Cluster Assembly (RCCA) in assembly 33A, the licensee identified that 2 absorber rods of the 24 had broken off at a point just below the spider vane. Subsequent inspection of all RCCA (53) revealed that 6 had one or two broken absorber rods (total of 8). Information developed by the vendor (Westinghouse) indicated that all the failed RCCA were manufactured using material from two lots of attachment fingers

which are brazed to the web assembly. The two lots in question were used only for manufacture of 25 RCCA in use at Salem Unit 1. The licensee elected to replace the remaining 19 rods, using RCCA from Unit 2. Since the core was in place, a technique to change the RCCA in-core using a modified RCC Change fixture was developed.

The inspector reviewed the applicable safety evaluation and procedures and witnessed the changeout of RCCA's. It was noted that the critical boron concentration, with all rods out, for the core is 1196 ppm. With refueling boron concentration in excess of 2000 ppm, removal of one RCCA would not be a criticality concern.

At the conclusion of the inspection, the RCCA changeout had been completed without incident.

- c. As a result of feedwater nozzle cracking identified at other facilities, the licensee has initiated a testing program of feedwater welds in containment. Radiographic and/or ultrasonic testing has identified circumferential cracking indications in all 4 nozzle to piping welds. A program to make repairs and complete evaluation of all in-containment welds has been initiated and will be completed prior to return to service. This area will be reviewed further in subsequent inspections.
- d. At approximately 2130 on June 27, 1979, area radiation monitors in the Auxiliary Building, elevation 84 feet, alarmed. The building was evacuated pending evaluation of the problem. Radiation surveys indicated levels on the Refueling Water Storage Tank (RWST) suction line as high as 30 R/hr on contact. Levels dropped rapidly to background at distances of 40-50 feet from a point just inside the pipe penetration through the Auxiliary Building wall. The source appears to be a deposition of material along approximately 20 feet of the pipe length. The origin and nature of the material has not been identified, nor a course of action to disposition the material developed. Prior to this event, the 20-inch line had been used to return borated water from the primary system to the RWST while reducing water level and decontaminating the refueling cavity. The inspector verified that appropriate measures for posting the area, restricting access, and minimizing personnel exposure had been taken. No release outside, or inside, the building occurred. No increase in levels of radiation in adjacent areas was noted. Further review of this event will be conducted when corrective measures are developed.

The inspector had no further questions relative to the above items at this time.

Unit 2

9. Plant Tour

a. The inspector conducted periodic tours of accessible areas in the plant. During these tours, the following specific items were evaluated:

- Hot Work. Adequacy of fire prevention/protection measures used.
- Fire Equipment. Operability and evidence of periodic inspection of fire suppression equipment.
- Housekeeping. Minimal accumulations of debris and maintenance of required cleanness levels in systems under or following testing.
- Equipment Preservation. Maintenance of special precautionary measures for installed equipment, as applicable.
- Component Tagging. Implementation and observance of equipment tagging for safety or equipment protection. Six tags were selected and were found to be in place as required.
- Maintenance. Corrective maintenance in accordance with established procedures.
- Instrumentation. Adequate protection for installed instrumentation.
- Cable Pulling. Adequate measures taken to protect cable from damage while being pulled.
- Communication. Effectiveness of public address system in all areas of the site.
- Equipment Controls. Effectiveness of jurisdictional controls in precluding unauthorized work on systems in test or which have been tested.
- Logs. Completeness of logs maintained and resolution of identified problems.

- Foreign Material Exclusion. Maintenance of controls to assure systems which have been cleaned and flushed are not reopened to admit foreign material.
- Security. Implementation of security provisions. Particular attention to maintenance of the Unit 1 protected area boundary.
- Testing. Spot-checks of testing in progress were conducted.

b. The following comment applies to tours made during this inspection period.

- Portable Fire Extinguishers in the diesel generator areas were apparently not being inspected monthly. Corrective steps were taken to firmly define responsibility for these inspections and the inspections were conducted.
- Service Water vent valve 22SW265 was left open, resulting in a stream of water in the South Penetration area. The operator in the control room was unaware of the valve status. The valve was immediately shut.
- A section of insulated tubing, located between valves 2RC3 and 2RC2 in containment had been apparently used as a frequent hand-hold, resulting in working of the tubing and raising concern as to its integrity. This item was identified for evaluation and resolution through the applicant's quality program.
- The nuts and studs securing the Auxiliary Feedwater/Service Water spool piece were noted to be painted. A demonstration that this spool piece can be installed within 30 minutes has been performed. The inspector will verify that the paint has been removed during a subsequent inspection.

c. The inspector had no further questions relative to observations made during plant tours.

10. Operational Readiness

10 CFR 50.57 states that the issuance of an operation license is, in part, contingent upon a finding that construction of the facility has been substantially completed, in conformity with the construction permit and the application, as amended, the provision of the

Act, and the rules and regulations of the Commission; and that the facility will be operated in conformity with the applications as amended, the provisions of the Act, and the rules and regulations of the Commission.

In order to provide a basis for this finding, the inspector is conducting a continuing review of licensee readiness to operate the facility. This review includes, but is not limited to, the following areas:

- Completion of the NRC inspection program to assess construction, testing and operational preparedness.
- Status of facility operating procedures and personnel training.
- Status of all enforcement items and unresolved matters.
- Status of the preoperational test program.
- Status of construction activities.
- Review of licensee outstanding items, particularly those identified for completion or resolution after core load.
- Review of proposed facility Technical Specifications.
- Implementation of corrective measures for Unit 2 as a result of items identified in Unit 1 from Reportable Occurrences, inspection findings, and IE Bulletins and Circulars.

Operational safety concerns arising from the above reviews will be promptly identified to facility management for resolution prior to the inspector reaching a finding of operational readiness. No specific safety concerns have been identified to date.

SITE

11. IE Bulletin and Circular Followup

- a. Pursuant to IE Bulletin 79-02, Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts, the licensee has instituted a program of pull testing, on a sampling basis, floor mounted anchors and ultrasonic verification of embedment depth for wall and ceiling mounted anchor bolts. At the conclusion of this inspection, the licensee had not yet submitted a response to the Bulletin. The test program is expected to continue beyond the required response date (July 8, 1979).

The inspector witnessed three pull tests conducted in the Unit 1 and Unit 2 containments and selected UT verifications of bolt embedment. The pull tests witnessed were successful and no failure has been experienced to date. Evaluation of embedment depth acceptability has not been completed; however, preliminary indications are that full embedment in accordance with the manufacturer's guidelines had not been achieved in all cases.

This area will be reviewed during subsequent inspections when evaluation data are developed.

- b. IE Circulars discussed below were reviewed to verify that they had been reviewed for applicability by cognizant management, and appropriate action initiated.

The review included discussions with licensee personnel and observation and review of items discussed in the details below.

- (1) IE Circular 78-18, UL Fire Test, was received, reviewed and evaluated by the licensee as documented in a memorandum dated January 10, 1979. The findings of the test are determined not to be applicable to the Salem designs due to the higher resistance to burning of the cable used and the employment of cabinets for vertical cable runs.
- (2) IE Circular 79-02, Failure of 120 Volt Vital AC Power Supplies, was received, reviewed and evaluated by the licensee as documented in a memorandum dated April 26, 1979. The Salem design is judged to be adequate since breaker trips are not employed, transient loads are considered in the design, and automatic transfer in both directions is available.
- (3) IE Circular 79-04, Loose Locking Nut on Limitorque Valve Operators, was received, reviewed and evaluated by the licensee as documented in a memorandum dated May 7, 1979. Preoperational test procedures document staking of vendor (Westinghouse) supplied valves. Other valves will be verified.

The inspector had no further questions relative to the above.

12. Unresolved Items

Areas for which more information is required to determine acceptability are considered unresolved. Unresolved items are contained in Paragraphs 4 and 6 of this report.

13. Exit Interview

At periodic intervals during the course of this inspection, meetings were held with senior facility management to discuss inspection scope and findings.