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

Region I

Report No. 50-272/79-25
50-311/79-13

Docket No. 50-272
50-311

License No. DPR-70
CPPR-53

Priority -- Category 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: August 5 - September 9, 1979

Inspectors: L. J. Norrholm, Resident Inspector — 9/26/79 date signed

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Approved by: R. R. Keimig, Chief, Reactor Projects Section No. 1, RO&NS Branch — 9/26/79 date signed

Inspection Summary:
Inspections on August 5 - September 9, 1979 (Combined Report Nos. 50-272/79-25 and 50-311/79-13)
Unit 1 Areas Inspected: Routine inspections by the resident inspector of plant operations including tours of the facility; log and record reviews; review of licensee events; review of Monthly Operating Reports; followup on IE Bulletins; and, followup on previous inspection items. The inspections involved 55 inspector-hours by the resident NRC inspector.
Unit 2 Areas Inspected: Routine inspections by the resident inspector of plant preoperational testing including tours of the facility; quality assurance; fire protection; preparedness for an operating license; and followup on previous inspection items. The inspections involved 14 hours by the resident NRC inspector.
Results: No items of noncompliance were identified.

Region I Form 12
(Rev. April 77)

DETAILS

1. Persons Contacted

J. Ciccone, 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) Unresolved Item (272/79-12-01): Procedure to bleed down steam driven auxiliary feedwater pump governor to ensure availability for restart following shutdown. The inspector verified that OI III-10.3.1 had been modified to require that the governor be manually bled down after each shutdown of the unit.

(Closed) Unresolved Item (272/79-13-01): Replacement and testing of vital bus differential relays and coils. By field inspection and review of design change package 1EC-523A, the inspector verified that the original relays had been replaced with type 12PVD21 relays with the required seismic qualification. Th inspector also reviewed relay test data detailing testing conducted by the Relay Department following replacement. The inspector had no further questions on this item.

(Closed) Unresolved Item (272/79-15-04): Provide procedural guidance relative to Reactor Coolant Pump tripping following an accident and formalize NPSH curves posted in the control room. The inspector reviewed Emergency Instruction I-4.0, Revision 0, dated July 16, 1979. The operator is directed to trip all operating reactor coolant pumps if pressure reaches the safety injection point (1765 psi). The licensee has elected to delete the NPSH curve from the control room and provides no further direction which would cause the pumps to remain operating in a loss of pressure/coolant condition. The inspector had no further questions in this area at this time.

(Closed) Follow Item (272/79-15-05): Correction to LER 79-14. A corrected copy of the subject Licensee Event Report was submitted.

(Closed) Follow Item (272/79-15-06): Correction to LER 79-27. By letter dated June 1, 1979, the licensee corrected the subject Licensee Event Report to detail the actual corrective measures taken to prevent recurrence of the loss in fire protection water volume. The inspector had no further questions.

(Closed) Follow Item (272/79-18-03): Report of type "C" valve test failures. On August 10, 1979, the licensee submitted Licensee Event Report Number 79-51/03L, detailing those valves which failed type "C" testing. The report will be evaluated during a subsequent inspection which will also subject the integrated leak rate test results to review.

(Closed) Unresolved Item (311/79-29-01): Addition of a phone jack for communications in the South Penetration. The inspector verified that communications capability now exists in the South Penetration area sufficient to support a plant cooldown outside the control room.

(Closed) Unresolved Item (311/78-43-02): Evaluation of acceptable steam generator (S/G) snubber thread engagement. A licensee engineering evaluation concluded that 5 1/4" was the minimum acceptable thread engagement of the snubber ram. Three snubbers on S/G 21, which did not meet this criteria, were adjusted. The inspector verified that all Unit 2 S/G snubbers conform to the above criteria and that the remaining discrepancies had been corrected.

Unit 1

3. Shift Logs and Operating Records

a. The inspector reviewed the following plant procedures to determine that 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

-- AP-6, Operational Incidents, Revision 5, November 20, 1978

-- AP-13, Control of Lifted Leads and Jumpers, Revision 3, February 22, 1979

-- Operations Directive Manual

-- AP-15, Tagging Rules, Revision 0, April 13, 1976

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;

-- Incident reports detail no violation of Technical Specification LCO or reporting requirement; and,

-- Logs and records were maintained in accordance with Technical Specifications and the procedures in 3.a above.

c. The review included the following plant shift logs and operating records as indicated and discussions with licensee personnel:

-- Log No. 1 - Control Room Daily Log, August 4, 5, 7, 8, 12, 14, 15, 20, 21, 22, 25-28, 30, 31, September 1-4, 6

-- Log No. 3 - Control Console Reading Sheet, August 4, 5, 7, 8, 12, 14, 15, 20, 21, 22, 25-28, 30, 31, September 1-4, 6

The inspector had no further questions in this area.

4. Plant Tour

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

-- Control Room (daily)

-- Relay Room

-- Auxiliary Building

-- Containment

-- Yard Area and Perimeter

-- Rad Waste Building

-- Switchgear Rooms 4KV and 480/230

-- Control Point

-- Turbine Building

b. The following determinations were made:

-- Monitoring instrumentation. The inspector frequently verified that selected instruments were functional and demonstrated parameters within Technical Specification limits.

-- Valve positions. The inspector verified that selected valves were in position or condition required by 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 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, except as noted below.

-- Equipment tagging. The inspector selected components for which valid tagging requests were in effect and verified that the tags were in place and the equipment in the condition specified.

-- Control Room annunciators. Selected lit annunciators were discussed with control room operators to verify that the reason 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 inspectors observed that frequent tours were made by shift supervision.

c. The following acceptance criteria were used for the above items.

-- Technical Specifications

-- Operatings Directives Manual

-- Inspector Judgement

d. The following specific comments apply to observations made during plant tours.

-- On several occasions, the inspector noted that fire doors providing a barrier for safety related areas were fouled with power and welding cable such that the door could not shut. In some instances, no work was in progress and no personnel were in the area to shut the door if necessary. The inspector stated his position that an open fire door should be treated as an open penetration and a fire watch stationed or the door secured when not attended. This item is unresolved pending establishment of procedural requirements to address routing of interference items through fire doors (272/79-25-01).

-- During an inspection tour of the Unit 1/Unit 2 interface areas, the inspector identified a breach in Unit 2 vital area barrier. This item is addressed in a special NRC Inspection Report (50-272/79-26).

-- Three hangers on the control air system in the Auxiliary Building were found in various states of disassembly. No authorized work on the system or in the area was identified. A work order to repair the hangers was initiated. The on-going field verification of hangers pursuant to IE Bulletin 79-14 should detect any similar deficiencies.

The inspector had no further questions in this area.

5. Review of Periodic and Special Reports

Upon receipt, periodic and special reports submitted by the licensee pursuant to Technical Specifications 6.9.1 and 6.9.2 are reviewed by the inspector.

This review includes the following considerations:

-- The report includes the information required to be reported by NRC requirements;

-- Test results and/or supporting information are consistent with design predictions and performance specifications;

-- Planned corrective action is adequate for resolution of identified problems; and,

-- Determination whether any information in the report should be classified as an abnormal occurrence.

Within the scope of the above, the following periodic reports were reviewed by the inspector:

-- Monthly Operating Report - May, 1979 through July, 1979.

The inspector stated a concern that the listing of safety related maintenance lacked sufficient information in some cases to adequately assess the significance or scope of the maintenance action. Review of on-site supporting information identified no safety concerns relative to selected maintenance activities. The licensee stated that an effort will be made to provide a more complete statement of the problem and corrective action in future reports.

The inspector had no further questions in this area.

6. Containment Integrated Leak Rate Test

On August 9, 1979, containment pressurization commenced for the first periodic integrated leak rate test. The test was completed with a pump-back verification on August 12, 1979. The inspector observed portions of the test and reviewed the test procedure, SP(0) 4.6.1.2, Containment System-Type A ILRT, Revision 0, dated June 29, 1979. The inspector also verified; procedure in use at the test site, equipment calibrations, test personnel qualifications, test prerequisites, and test approval. Preliminary results indicate a total leak rate less than 0.7 La.

Test results will be reviewed in detail in a subsequent inspection following issue of the licensee's test report.

The inspector had no further questions in this area.

7. Other Items

a. On August 12, 1979, a 100 Ci Ir-192 radiography source became detached from its cable while extended in the source tube and could not be returned to its shielded storage location. The source was in use for radiography of feedwater piping in the turbine building. The inspector verified that adequate posting and monitoring of the resulting high radiation area was maintained until the source was returned to its storage location by vendor personnel on August 13, 1979. With the exception of one licensee health physic technician who received approximately 200 mrem, radiation doses were minimal as a result of this event. The source license is held by Catalytic, Inc., a subcontractor on site.

b. During the evening of September 5-6, 1979, tropical storm "David" passed through the site area. Sustained winds of 50-55 mph were experienced, with a short peak to 70 mph. Tide levels were highest at 95' datum. The licensee's emergency plan was not put into effect, however, some precautionary measures to secure the plant from flooding were taken. No effects on the plant were sustained due to the storm. The only apparent damage was to three trailers on site which turned over due to high winds.

Unit 2

8. Plant Tour

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. Five 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. Several work activities in progress were observed and each verified to be authorized by applicable procedures.

-- 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.

The inspector had no questions relative to tours made during this inspection period.

9. Preoperational Testing Program

a. By correspondence dated January 4, 1979, the applicant committed to testing of the emergency diesel generators in accordance with Regulatory Guide 1.108 which requires, in part, that 23 successful consecutive starts of each diesel with subsequent loading to at least 50% be demonstrated. The inspector observed testing in progress and reviewed the test log when each diesel completed the demonstration sequence. Two of the three diesels (2B and 2C) experienced failures to start and the 23-start run was reinitiated. By June 4, 1979, all three diesel generators had successfully been started at least 23 times without a failure.

The starting failures were attributed to fuel rack binding such that the air operated plunger assembly which uses starting air to push the fuel racks to the "full fuel" position had insufficient force to position the racks. As a corrective measure, frequent lubrication of the fuel racks has been initiated on both units. In addition, with the concurrence of Alco Power Incorporated, the fuel racks are positioned to the "full fuel" position manually on each diesel shutdown, thus ensuring reliable starting at the next demand. Design changes have been initiated for all six diesel engines on site to route the air supply from a point further back on the header from the starting monitors. In this way, it is expected that the plunger air supply will not reduce in pressure due to the heavy simultaneous demand of the starting motors. Inspection on Salem Unit 1 verified that the fuel racks are maintained in the "full fuel" position during diesel standby.

b. To review the activities of the quality program, the inspector reviewed Surveillance Reports 3281 through 3283. These reports detail observations of preventive maintenance being conducted by UE&C on Unit 2 rotating equipment.

The inspector had no questions relative to these items.

c. Inspection of Unit 2 fire protection was conducted. The inspector noted that all Unit 2 heat and smoke detectors were calibrated by Kidde during March, 1979. Several zones were found to be inoperable due to modification work in progress. Fixed detection systems and portable suppression equipment have not been included in the Unit 1 periodic surveillance (Inspection Order) system resulting in sporadic surveillance. At the conclusion of this inspection period, regular surveillance of these items was initiated. This area will be inspected during a subsequent inspection as part of the routine program.

The inspector had no further questions relative to the above.

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 conducted a continuing review of licensee readiness to operate the facility. This review included, but was 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. The IE Bulletins discussed below were reviewed to verify that:

-- Licensee management forwarded copies of the response to the bulletin to appropriate onsite management representatives.

-- Information discussed in the licensee's reply was supported by facility records or by visual examination of the facility.

-- Corrective action taken was effected as described in the reply.

-- The licensee's reply was prompt and within the time period described in the bulletin.

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

b. By correspondence dated May 3, 1979, the licensee responded to IE Bulletin 79-07, Seismic Stress Analysis of Safety Related Piping. NRC review of the proposed sampling recalculation to validate the stresses concluded in the original calculations is continuing.

By correspondence dated August 16, 1979, the licensee responded to IE Bulletin 79-14, Seismic Analysis for As-Built Safety Related Piping Systems. In this response, the licensee outlined a program for verification of stress isometrics used in the seismic analysis.

The inspector conducted an independent verification, using a licensee-supplied isometric of the safety injection suction piping connecting the RWST to the safeguards' pump suctions. One item of concern was an as-built snubber shown on the isometric which was not present in the field. Investigation revealed that the snubber was part of a design change to be completed during this outage. The design change was accomplished before the conclusion of this report period. The inspector had no further questions relative to this verification.

In performing the seismic reanalysis, the licensee had determined that some seismic supports no longer met design criteria with recalculated stress values. In some cases, supports designed to be anchors may no longer function in the design manner. This finding was reported as LER 79-53. During a meeting with the staff on August 17, 1979, and later confirmed by correspondence from NRC:Region I, dated August 28, 1979, the licensee has committed to completing a sufficient portion of the recalculation and attendant repairs/modifications in order to provide the staff with a basis for return to service. This information will be provided prior to taking the plant to Mode 4.

The inspector accompanied licensee personnel performing field verification of as-built isometrics in the Auxiliary Building pipe chase area. The inspector expressed his concern that, despite the apparent experience level of the personnel conducting the verification, the procedure was too general in defining the inspection scope and criteria. The licensee presented a modified procedure which included those points and stated that they had been covered in verbal briefings of involved personnel prior to starting the verification.

The inspector had no further questions relative to these items.

c. By correspondence dated August 29, 1979, the licensee responded to IE Bulletin 79-06C, Nuclear Incident at Three Mile Island - Supplement. The inspector verified the licensee's statement that emergency instructions (I-4.0 - Safety Injection Initiation, Revision 0, dated July 16, 1979) require tripping of Reactor Coolant Pumps when pressure decreases below the safety injection initiation point and that procedural requirements for two licensed operators in the control room during Modes 1, 2, and 3 operation have been instituted.

The inspector also attended training conducted by the licensee for licensed operators as stated in the response to IE Bulletin 79-06A. The Three Mile Island transient was reviewed, as well as design changes instituted at Salem and procedure revisions made as a result of lessons learned from the event. No objective evaluation of this training was made by the licensee.

The inspector expressed his concern that subsequent design changes and procedure revisions which may result from the continuing reviews of this event, may not be promulgated to the operators since this was a special presentation dictated by the Bulletin. No routine mechanism appears to exist to ensure that such information is made available to the operators before it is encountered during plant operation. A similar concern is expressed in NRC Inspection Report 50-272/79-19 (Unresolved Item (272/79-19-03)). This item remains open pending establishment of an appropriate method of disseminating DRC as well as procedure change information to the operating staff.

The inspector had no further questions relative to the training provided.

d. By correspondence dated July 6, 1979, the licensee responded to IE Bulletin 79-02, Pipe Support Base Plate Design Using Concrete Expansion Bolts. Salem 1 and 2 employ Hilti "Quik-Bolts" to secure floor mounted base plates and wall and ceiling mounted structural steel which support safety related piping systems. The licensee's response outlines a test program consisting of pull tests on floor mounted base plates and ultrasonic examination of wall and ceiling bolts. In addition, to verify design adequacy of the installation, the licensee has joined an owner's group employing the services of Teledyne Engineering Services.

The licensee's test program identified several instances were repair or replacement of concrete anchor installations were required. Over 1600 supports, involving over 3300 anchor bolts in safety related systems were untrasonically tested. As a result of this testing, some corrective action was required in 243 installations to date. 241 have been completed. Licensee Event Report 79-49 identifies this finding.

An evaluation and description of corrective actions will be submitted as a supplement to the LER.

The inspector verified that repairs were made in accordance with manufacturer's instructions, received adequate quality control coverage, and observed repairs in progress.

The licensee's test program for anchor bolts verifies only embedment depth. No verification for loading capability for wall and ceiling mounted bolts was planned. At a meeting with the staff on August 17, 1979, the licensee committed to development and implementation of a sampling program to verify engagement of the bolt wedge to provide a basis for concluding that loading capability exists. No specific preload is used in the Salem installations. This test program will be completed in inaccessible areas prior to taking Unit 1 to Mode 4 as confirmed in correspondence from NRC:Region I dated August 28, 1979.

At the conclusion of this report period, this test program had not started.

The inspector had no further questions at this time.

12. Unresolved Items

Areas for which more information is required to determine acceptability are considered unresolved. An unresolved item is contained in Paragraph 4.d 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.