

U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 50-443/82-15
50-444/82-13

Docket No. 50-443
50-444

License No. CPPR-135
CPPR-136

Priority --

Category A

Licensee: Public Service Company of New Hampshire

1000 Elm Street

Manchester, New Hampshire 03105

Facility Name: Seabrook Station, Units 1 and 2

Inspection at: Seabrook, New Hampshire

Inspection conducted: November 8 - December 20, 1982

Inspectors: AC Cerne
A. C. Cerne, Sr. Resident Inspector

12/29/82
date signed

RA Gramm
R. A. Gramm, Resident Inspector

12/29/82
date signed

H. W. Kerch
H. W. Kerch, Mechanical Engineer, NDE

1/10/83
date signed

H. H. Nicholas, Reactor Inspector, Pre-Ops

Approved by: Robert M. Gallo
R. M. Gallo, Chief, Projects Section 1A,
Division of Resident and Project Inspection

1/10/83
date signed

Inspection Summary:

Unit 1 Inspection on November 8 - December 20, 1982 (Report No. 50-443/82-15)

Areas Inspected: Routine inspection by resident and regional inspectors of work activities, procedures and records relative to diesel generator coolant system piping and supports; electrical cable routing and separation, to include fire protection; and technical responses to design questions. The inspectors also reviewed licensee action on previously identified items and performed plant inspection-tours. A discussion of pre-operational issues and the startup test program was conducted. The inspection involved 111 inspector-hours, including three off-shift hours, by four NRC inspectors.

Results: Of the four areas inspected, one violation was identified in the following area-- Failure to adequately control the status of design changes to a pipe support installation, resulting in undersized welds and QA acceptance of same (paragraph 4b).

Unit 2 Inspection on November 8 - December 20, 1982 (Report No. 50-444/82-13)

Areas Inspected: Routine inspection by the resident inspectors of work activities, procedures, and records relative to design issues, licensee action on previously identified items and plant inspection-tours. The inspection involved 23 inspector hours, including one off-shift hour, by the NRC resident inspectors.

Results: No violations were identified.

8301270488 830112
PDR ADDCK 05000443
PDR

DETAILS

1. Persons Contacted

Yankee Atomic Electric Company (YAEC)

F. W. Bean, Lead Electrical QA Engineer
D. L. Covill, Lead Civil QA Engineer
D. G. Groves, Sr., QA Engineer (Framingham)
R. E. Guillette, Sr., QA Engineer (Framingham)
J. H. Herrin, Site Manager (PSNH)
G. F. McDonald, Jr., QA Manager (Framingham)
D. G. McLain, Startup Manager
J. F. Nay, Jr., Lead Mechanical QA Engineer
P. Oikle, NDE Level III (Framingham)
J. A. Philbrick, Senior Project Engineer (PSNH)
S. B. Sadosky, Lead Start-up/Test QA Engineer
J. W. Singleton, Field QA Manager
R. Tucker, Engineer (Framingham)

United Engineers and Constructors (UE&C)

R. H. Bryans, Site Engineering Manager
J. A. Grusetskie, Engineering Manager Assistant
D. C. Lambert, Field Superintendent of QA
D. E. McGarrigan, Manager-Project QA (Philadelphia)
B. B. Scott, Ass't. Manager, R&QA (Philadelphia)

Pullman-Higgins (Pullman)

J. J. Corcoran, Resident Manager
R. G. Davis, Field QA Manager
D. B. Hunt, QA Records Supervisor
A. D. Nance, Chief Field Engineer

Royal Insurance

J. C. Anzivino, Authorized Nuclear Inspector

Westinghouse

R. Powell, Project Manager

USNRC

*P. Hearn, Containment Systems Branch, NRR

* indicates telephone communication

2. Plant Inspection-Tours (Units 1 and 2)

The inspectors observed work activities in-progress, completed work and plant status in several areas of the plant during general inspections of the plant. The inspectors examined work for any obvious defects or noncompliance with regulatory requirements or license conditions. Particular note was taken of the presence of quality control inspectors and quality control evidence such as inspection records, material identification, nonconforming material identification, housekeeping and equipment preservation. The inspectors interviewed craft personnel, supervision, and quality inspection personnel as such personnel were available in the work areas.

Specifically, an inspector reviewed the nonconformance control and hold status of a major void in a concrete column located in the Unit 1 west, main steam line penetration area. He verified QC involvement and plans for nonshrink grout repair. In this same west penetration area, the inspector during the evening shift witnessed rebar-location operations utilizing radar equipment and mapping techniques. He also confirmed seismic isolation between the west penetration enclosure wall and the Primary Auxiliary Building down to an elevation where the west containment enclosure seal would not be adversely affected by the presence of the rodofam, isolation-joint material.

An inspector checked material control on a Unit 1 multiple support (MS-777-RG-05) in the component cooling line, verifying design details and material substitution in line with an Engineering Change Authorization (ECA 25/0969A). Reactor Pressure Vessel access controls were also checked during evening-shift operations. A path of unauthorized entrance through an unsecured reactor coolant pump bowl hatch, via cold-leg, loop piping, was identified and addressed to licensee security personnel. Discussion with QA personnel revealed the existence of an open deficiency report on this same issue.

Procurement control of two safety-related, solenoid valves in an otherwise nonsafety drain line was reviewed to assure quality specification requirements consistent with the containment isolation function of these valves. Additionally, the inspector reviewed nonconformance controls with regard to construction completion turnover to and interface with the site startup test group. UE&C Field General Construction Procedure (FGCP-34) had just been issued (11/24/82) to proceduralize such controls. The handling of long-range, action items as they affect component and system turnover was discussed with QA and licensee management personnel.

An inspector observed the installation of Unit 1 RHR pumps 1-RH-P-8A and 1-RH-P-8B. Receipt inspection report 871 was reviewed and preventive maintenance (PM) records covering the period from 5/79 to 5/80 for these Ingersoll-Rand pumps were examined. PM records for the Unit 2 pump 2-RH-P-8B motor were also examined for the period 5/79 to 11/79. The above records were found to be in order. He also observed the grouting of the turbine driven emergency feedwater pump foundation (Perini lift number 1-EFBP-FWP37B). The associated records were properly completed.

No violations were identified.

3. Licensee Action on Previous Inspection Findings

- a. (Closed) Deficiency (443/80-05-01 and 444/80-05-01): Permanent settling basin discharge exceeded turbidity limit. The inspector reviewed the settling basin effluent records which covered the period from July to November 1982. The average turbidity level was under 8 JTU for that period. Only on one occasion did the turbidity level exceed the 25 JTU limit and this single measurement was influenced by an excessively heavy rainfall. The average turbidity levels indicate that the settling basin is functioning properly to limit the effluent turbidity levels. The inspector considers this item closed.
- b. (Closed) Deficiency (443/80-05-02 and 444/80-05-02): Failure to control effluent turbidity from temporary settling basins. The inspector ascertained that the temporary settling basins are no longer in use and have been removed from the site. This item is closed.
- c. (Closed) Infraction (443/80-05-03 and 444/80-05-03): Noncompliance of site conditions with FES commitments. The inspector reviewed the licensee response to the NRC Notice of Violation and verified the following corrective actions:

- The site perimeter haybales, to control turbid run-off water, were examined and appear to be effectively mitigating the undesirable run-off effects.
- The "South 40" area was examined and the placement of "No Dumping Over Side Slope" signs was verified. No recent dumping of waste concrete outside of designated areas was noted.
- Project notice 9763.011 was reviewed for the manner in which administrative controls were applied to "South 40" dumping. The licensee has updated this notice as of December 6, 1982 and committed to placing it within vehicles which operate in the dumping area.
- Recent environmental surveillance check lists were examined to verify coverage of the site areas of concern.
- The temporary settling basins have been disbanded.

The proper corrective actions have been instituted to assure control over these site conditions. The inspector considers this item closed.

- d. (Closed) Unresolved item (443/82-02-01): Containment penetration code boundary clarification. The inspector reviewed ECA 19/0297B and UE&C Memo MM9197A and determined that the ASME Section III code designation for the subject boundary and welds has been changed from subsection NC, Class II, to subsection NE, Class MC. The relevant effects of such a change upon weld NDE, weld code data reporting, material NDE, and weld and material impact tests requirements appear to have been adequately

assessed by A/E personnel. The inspector has no further questions on this issue.

- e. (Closed) Violation (443/82-06-10): Weld CS-369-10, F1006 had rejectable linear indications which appeared in both NRC and licensee radiographs. The licensee repaired the weld and re-examined it nondestructively to verify its compliance to the ASME III code. The radiographic supervisor was relieved and replaced. The licensee has performed additional film reviews to verify that this was a unique occurrence and now utilizes more sensitive radiographic film. This item is closed.
- f. (Open) Unresolved items (443/82-06-11): Weld CBS-1202-07, F0708 has a linear indication which was identified by the licensee as acceptable. The NRC did not concur with the evaluation at the time of the inspection. The licensee has since performed ultrasonic inspection in accordance with a Site Project Position for Resolving Radiographic Root Concavity, together with centerline creases on film. Based upon this practice, the NRC now concurs with the licensee evaluation and this item is considered closed.

Weld SI-204-02, F0202 has linear indications which appear in the NRC radiograph film, but not in the licensee film. The licensee has not completed action on this item; therefore, this unresolved item remains open.

- g. (Closed) Violation (443/82-10-02): Failure to specify appropriate bolting material and installation standards. The inspector reviewed the licensee response to the Notice of Violation, noting the engineering position stated with regard to exceptions to the AISC Steel Manual. The corrective steps taken to provide specific details in both the design drawings and erection specifications appear to be commensurate with the severity of the violation and the need to provide effective controls. This item is closed.
- h. (Closed) Unresolved item (443/82-10-03): Triaxial stress concentrations in stiffener welds. The inspector reviewed a UE&C Request for Information (RFI 74/1786A), addressing the particular PW-4001-4 pipe whip restraint situation and a more generic RFI (74/1788A), questioning weld overlap from a triaxial stress standpoint. In both cases, existing configurations were accepted based upon the fact that engineering analysis had considered the most critical case of no snipe holes and had therefore taken into account any triaxial stress concentrations. Based upon these design considerations, the inspector has no further questions on this issue.

4. Diesel Generator Coolant System (Unit 1)

- a. The inspector traced the routing of the closed-loop, diesel generator (DG) component cooling water piping for each train from the DG building, thru the yard and tank farm areas, into the Primary Auxiliary Building up to the pipe connections to the heat exchangers, cooled by service

water (SW) piping. The location of pipe supports, the proximity of redundant lines, and the protective wrapping and cathodic protection for buried runs of the piping were all checked. Proper connections to the "A" train (E42A) and "B" train (E42B) heat exchangers, to include installation of in-line valves, were verified.

The DG cooling water P & I Diagram (F202103), the Colt purchase order 201-1 drawing for the heat exchangers (Foreign Print - FP20839), and FSAR details discussing pipe routing to address common mode failure concerns were all reviewed for criteria used in evaluating the adequacy of the observed field conditions. ECA 02/0372A, authorizing the train-for-train substitution of Unit 2 DG components into the Unit 1 construction, was examined and checked with regard to equipment tagging, preventive maintenance and record accuracy.

While no violations were identified with regard to the above DG inspection items, a problem was identified with regard to a support for the SW piping to these same DG heat exchangers, as discussed in paragraph b. below.

- b. The inspector traced the SW piping back from heat exchangers E42 A and B to the tank farm area immediately prior to its underground run as buried piping. At that location, a SW pipe support was randomly selected and inspected against the appropriate drawing requirements and installation procedures. The following documents for Support 1815-RG-4 were reviewed:

- UE&C drawing M801815S (Sheet 6) and ECAs 73/3172C and 73/4110A
- Pullman-Higgins (P-H) hanger drawing 1815-RG-4 and Nonconformance Reports (NCR) 2612, 2643, 2659, 2697, and 3753.
- P-H document control package for support 1815-RG-4, including Field Weld Process Sheets and Expansion Anchor Process Sheets

The inspector identified the following problems:

- 1) An error in the drawing orientation of Hilti expansion anchor Kwik-bolts associated with P-H NCR 2659, caused an erroneous design assumption in a UE&C redesign of one hanger base plate (ECA 73/4110A). This presently results in the installation and acceptance of a questionably torqued bolt.
- 2) UE&C redesign of certain hanger field welds (ECA 73/3172C) was apparently not identified in the P-H work order to revise the support, resulting in undersized welds.
- 3) Clearance dimensions between the pipe clamp saddles and the pipe support legs exceed the P-H procedural tolerances.

While problem (3) is still being investigated by licensee and contractor QA personnel, the apparent cause of problems (1) and (2) was a failure to adequately track the status of design changes, installation and inspections, as required by the process sheet controls of P-H procedure JS-1X-6. Field welds which had been inspected and accepted under older design criteria, were not reopened for inspection when the redesign revised the weld sizes. Similarly, the kwik-bolt process sheets didn't adequately track the bolt installations such that the orientation/design error could be flagged during the inspection process.

Since the process sheets and record package for support 1815-RG-4 had been turned over to P-H document control, with no evidence that any further inspections or audits would have identified the noted problems, the NRC inspector notified YAEC QA engineers on December 15, 1982 and the YAEC field QA manager during an exit interview on December 17, 1982 that this failure to control the status of inspections and design changes for the subject pipe support, represents a violation with regard to 10CFR50, Appendix B, Criteria III and XIV (443/82-15-01).

- c. Since the base plates for support 1815-RG-4 had not yet been grouted, the inspector reviewed procedural controls over such grouting operations, particularly where coordination between different contractors is required. He verified that QA controls, including inspection, are being applied to such safety-related grout placements and that procedural mechanisms (eg: UE&C Field General Construction Procedure, FGCP-27) exist to control the contractor interfaces and track the grouting requests to assure completion of the required work. The sequence of grout placement, relative to anchor or kwik-bolt torque application, was discussed with QA and engineering personnel.

No violations were identified.

5. Electrical Installations (Unit 1)

a. Cable Routing and Separation

An inspector examined cable routing, to include train and channel separation, color codes and marking, and triplexing, in the following Unit 1 areas:

- Train A and B containment penetration tunnels
- Control Building (CB) essential switchgear tray penetrating the Primary Auxiliary Building (PAB)
- Diesel Generator (DG) Building above and below elevation (21)

Cable terminations in a control room board and a DG control panel were spot-checked and cable end protection, prior to termination, was verified. The inspector also examined electrical duct bank runs to the Service Water

Building, particularly noting conduit spacing and rebar configuration. The use of flexible metal conduit, in accordance with UE&C standard notes and details (drawing M300228), was verified; as was the installation of seismic separation joints in cable tray traversing the CB/PAB boundary.

No violations were identified.

b. Fire Protection

An inspector spot-checked various aspects of the installation of the permanent plant fire protection system, most specifically as it relates to electrical protection. Erection of a fire wall between the train A and B switchgear equipment was witnessed. Design and inspection to seismic and Regulatory Guide 1.29 requirements were verified. The installation of fire proofing material in the DG building was also examined. The inspector confirmed the existence of controls (UE&C Procedure FACP-2) to handle damage to this material caused either accidentally or by necessity to complete the erection of other permanent plant components (eg: pipe supports).

In the Control Building, where HVAC ductwork penetrates walls separating A from B train cable, the inspector verified the installation of fire dampers. Additionally, for runs of nonsafety fire protection piping, he spot-checked pipe support installations to confirm appropriate process and inspection controls.

No violations were identified.

6. Design Issues (Units 1 and 2)

The inspector noted that the FSAR description of the Service Water system appeared to contain statements contradictory to the plant design. Pages 9.2-1 and 9.2-4 of the FSAR state that safety related components of the system are within Category I structures and that all service water piping is protected from tornado generated missiles. The inspector reviewed drawing F805033 which illustrated ASME valves within the intake and discharge transition structures and drawing F202479 which did not indicate the transition structures to be Category I. NRR Requests for Additional Information, RAI's 410.10 and 410.25 were found to pertain to the protection of the service water system from natural phenomenon. In response to those RAI's, table 3.5-12 of the FSAR was amended to include the transition structures to provide tornado missile protection. Section 3.5.2 was revised to include analyses of the system within the intake and discharge structure for the effects of tornado generated missiles. The inspector further reviewed Figures 9.2-1 and 9.2-7 to ascertain that the valves in question are suitably isolated from the cooling tower portion of the system after an SSE. The responses to RAI's 410.10 and 410.25 have adequately clarified the service water protection from natural phenomenon.

However, with regard to other FSAR commitments and RAI responses, further licensee clarification is required to address some apparently contradictory

information. These issues and their applicable references are listed below:

- cadweld splice stagger to the ACI-349 Code (RAI 220.32)
- common mode flooding of the PAB equipment vaults (RAI 410.34)
- DG control panel vibration (RAI 430.65)
- containment isolation on RHR suction lines (FSAR para. 3.1.5.6 and 6.2.4.1)
- containment isolation valve (MSIV) location (FSAR para. 6.2.4.2)

While certain points may be clarified with FSAR revisions and the licensee has already taken action, in certain cases, to initiate such changes, other items require a more technical evaluation to confirm that referenced engineering positions are consistent with design basis commitments. In question, also, is the licensee program for updating the FSAR to refine or correct earlier PSAR projections.

Pending licensee clarification of the technical aspects for the above items and NRC review of the program of controls for FSAR revision, these design issues are unresolved (443/82-15-02).

7. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 6.

8. Management Meetings

- a. At periodic intervals during the course of this inspection, meetings were held with senior plant management to discuss the scope and findings of this inspection.
- b. On November 10, 1982, the NRC regional NDE specialist met with the licensee Level III engineer to discuss corrective actions to be taken in response to the NDE findings in the CAT 82-06 inspection report. The NRC inspector requested that the licensee formally document their position on the open radiographic issues. On November 22, 1982, a PSNH letter (SBN-380) was sent to the NRC summarizing the status of these NDE items and indicating the generic measures taken as further corrective action.
- c. On December 7, 1982, a meeting was held at the Seabrook site to discuss aspects of the Startup Test Program with an overview of the Phase I, Construction Verification Test Program and Phase 2, Preoperational Test Program. Areas of discussion included presentations by the licensee's representatives of test program organization, manpower, procedures, testing, test completions and turnovers. Included in the discussions was the interface between Construction Verification Testing and Preoperational Testing with particular emphasis on the Quality Assurance Program during testing.

The NRC regional-based inspector presented an outline of the preoperational test inspection program covering construction verification testing through preoperational testing to startup testing. Areas discussed included test program requirements and implementation; mandatory tests, primal tests and category I, II and III tests; and, test procedure review and verification, test witnessing and test results evaluation.

Several points were clarified during the meeting in discussing both the licensee preoperational and NRC inspection programs. Further meetings are scheduled and additional NRC reviews of the testing program will be made as part of the routine inspection program during the preoperational and startup testing periods.