

U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 50-443/84-13  
50-444/84-05

Docket No. 50-443  
50-444  
CPPR-135

License No. 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: August 27-October 26, 1984

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

11/6/84  
date signed

H.M. Wescott  
H.M. Wescott, Resident Inspector

11-5-84  
date signed

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date signed

Approved by: Robert M. Gallo  
R.M. Gallo, Chief, Projects Section 2A,  
Division of Project and Resident Programs

11/21/84  
date signed

Inspection Summary:

Unit 1 Inspection on August 27-October 26, 1984 (Combined Report No. 50-443/84-13 and 50-444/84-05)

Areas Inspected: Routine inspection by the resident inspectors of work activities, procedures and records relative to instrumentation procedures and implementation to include instrument cable terminations; cable pulling; piping and support welding; the steam generator lateral support structures; Field QA Manual; and a sample of design changes (Unit 1), and ASME Code Case commitments and the licensee 10CFR50.55(e) program (both Units 1&2). The inspectors also reviewed licensee action on previously identified items and performed plant inspection-tours. The inspection involved 239 inspection hours, including 22 off-shift and holiday hours, of Unit 1 activities and 6 inspection-hours of Unit 2 activities.

Results: One violation (Unit 1) was identified concerning inadequate records for the steam generator lateral supports installation (paragraph 7).

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DETAILS1. Persons Contacted

J. DeVincentis, Project Engineering Manager (YAEC)  
W. N. Fadden, Lead Instrumentation Engineer (YAEC)  
W. P. Johnson, Vice President (PSNH)  
G. A. Kann, Phase 2-6 Test Group Manager (YAEC)  
D. C. Lambert, Field Superintendent of QA (UE&C)  
D. A. Maidrand, Assistant Project Manager (YAEC)  
G. F. McDonald, Construction QA Manager (YAEC)  
D. E. McGarrigan, Manager-Project QA (UE&C)  
J. A. Philbrick, Senior Project Engineer (PSNH)  
J. W. Singleton, Field QA Manager (YAEC)  
C. E. Walker, Systems Engineer (Westinghouse)

Interviews and discussions with other members of the licensee and contractors management and staff were also conducted relative to the inspection items documented in this report.

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, the inspector randomly checked in-process welding operations for piping, tubing, and supports in the Unit 1 containment and primary auxiliary building, during both first and second shift activities. Process sheets and field drawings were spot-checked and a couple of as-welded support field conditions were evaluated against the design requirements. The inspector also interviewed certain welders regarding in-process erection controls, such as inspection hold points and NDE activities.

During a tour of the Unit 1 containment an individual approached the NRC inspector and stated that a "pump" was leaking and was not being taken care of. The inspector asked the individual to show him the "pump" which was in fact a Limitorque operator for valve, V-42 located at the -23'6" level, at approximately 173° azimuth. V-42 was leaking at the valve stem packing gland at an estimated rate of 1.5 gpm. Since testing of the pipe line containing V-42 was neither in-progress nor had been previously performed, the valve leak had no nuclear safety implications at that particular time. This was determined not to be a QA/QC matter. However, the inspector did inform YAEC QA management of this occurrence for their disposition.

No violations were identified.

### 3. Licensee Action on Previously Identified Items

- a. (Closed) Violation (443/83-09-01): Inadequate corrective action for an engineering deviation and a documentation nonconformance. The inspector confirmed the issuance of Engineering Change Authorization (ECA) 25/5137A and Pullman-Higgins (P-H) nonconformance report (NCR) 4426, which addressed and corrected the specific problem areas. From a generic standpoint, P-H procedures, III-4 on Design Document Control and VI-9 on the Document Verification Center, have been revised and reissued. The revised procedures illustrate better programmatic control of the two areas identified in the violation: (1) the status of documents affected by a design change and (2) the distribution and accountability of QA records for in-process activities.

Based upon both the specific and generic corrective actions, this violation is closed.

- b. (Closed) Deviation (443/83-17-03): Inability to meet an FSAR commitment on future leak chase testing. The licensee investigated other containment liner welds and determined that the leak chases of only two welds (ie: containment penetrations X60 and X61) were inaccessible, precluding future leak testing throughout the life of the plant. The inspector verified that the code required leak testing had been accomplished for the subject welds prior to installation in the liner and subsequent embedment in concrete.

An amendment to FSAR section 3.8.1.1 is being issued to document the exception to future leak testing for containment penetrations X-60 and X-61. Since no code requirement was violated and the FSAR commitment is being revised, a deviation no longer exists and this item is closed.

- c. (Closed) Unresolved Item (443/83-22-01): Trend analysis indicates weakness in maintaining weld material control. The inspector reviewed five YAEC Field Quality Assurance Group surveillance reports. The surveillances had taken place between 7/25/84 and 10/3/84. During this period two deficiencies were identified concerning weld rod hold ovens: (1) two different types of alloy rod 309L and 316L in the same oven and (2) a portable rod oven 28°F lower than setting. Item (1) was closed stating that it was a violation of governing procedures and that it was verified no weld material was issued from the oven. Item (2) was corrected on the spot. The temperature range was not compromised.

Based upon the continued licensee trending, the lower recurrence of deficiencies, and the appropriate corrective action, this unresolved item is considered to be closed.

- d. (Closed) Unresolved Item (443/83-22-06): Minor deficiencies in completed and inspected cable tray within containment. The inspector reviewed YAEC Surveillance Reports issued following inspection walkdowns of installed cable tray and cables within Unit 1 containment. Deficiency Report findings were documented in Fischbach inspection reports and NCR FBM-564 which required reinspection and corrective action where necessary. The severity of the deficiencies identified by the YAEC surveillances were minor in nature and similar to those identified by the NRC inspection.

The reinspection and rework appears to have corrected the individual items. No programmatic breakdown is evident.

Also, ECA 54/5666A was issued to specify design criteria for ground cable crossing the cable tray seismic expansion gaps. A minimum of 6" cable loops are now provided to compensate for any potential movement.

This issue is closed.

- e. (Closed) Unresolved Items (443/82-13-02 and 443/84-08-02) and Deviation (443/83-17-04). Closure of these items is based upon formal licensee written reporting of the applicable issues as potential Construction Deficiency Reports (CDR) under 10CFR50.55(e), as follows:
- (1) Unresolved item 443/82-13-02 was reported as a potential design deficiency regarding the adequacy of tornado missile shield protection in the Fuel Storage Building. Subsequently, the licensee reported this item not to be a reportable deficiency based upon probabilistic analysis. The Applied Research Associates report (C569) on the Tornado Missile Analysis for Seabrook is under review by the NRC and this CDR item remains open (82-00-12).
  - (2) Deviation 443/83-17-04 was reported as a potential deficiency in the design of seam closure welds for the recirculation piping encapsulation tanks and for the fuel transfer tube which constitute containment atmospheric boundaries. Redesign and planned rework entails installation of leak channels over the subject encapsulation tank welds and stiffening the expansion joint end plates for the fuel transfer tube. Since this rework has not yet been accomplished, this CDR item remains open (84-00-05).
  - (3) Unresolved item 84-08-02 was reported as a potential deficiency in the failure to seismically qualify the Control Rod Drive Mechanism cooling shroud. The licensee and supplying contractor, Westinghouse, are working toward eventual seismic qualification of the CRDM shroud for its intended use as an intervening structural element in the support of Class 1 Reactor Vessel piping. This CDR item remains open pending the final licensee report on this matter (84-00-14).
- f. (Closed) Construction Deficiency Report (CDR 83-00-15): Improper cable separation in Westinghouse 7300 series Process Protection System Cabinets. The licensee subsequently determined this item not to be reportable based upon the nonsafety-related status of the subject cables and the fact that only low voltage, instrument levels were involved. The inspector noted that proper isolation between safety-related and nonsafety circuits was found to exist. Thus the nonreportable nature of this CDR appears to be justified.

Also, a Construction Appraisal Team finding (item 84-07-10, still open) requires continued field modification work by the licensee to identify and correct electrical separation violations in panels and cabinets. Based upon this existing open item and nonsafety significance of the potentially reportable item, this CDR is closed.

- g. (Closed) Construction Deficiency Report (CDR 82-00-06): Containment Enclosure Building horizontal missile shields. The inspector reviewed ECA No.01/3620A, dated 7/21/82 and ECA No.01/3595B, dated 7/14/82 with attachments (four sheets). These ECA's required a change in shape and size of rebar ties to achieve adequate hook embedment in the 15 inch containment enclosure wall as shown in ECA 01/3595B and drawing F101457.

The inspector concludes that the action taken is in conformance with the licensee's final report to USNRC, R-I, dated August 16,1982 (SBN-308, T.F. Q2.2.2). This CDR is therefore considered to be closed.

- h. (Closed) Construction Deficiency Report (CDR 82-00-13): Cold pulling of pipe. The inspector reviewed Pullman-Higgins NCR No.B0749, Revision 2, closed 9/27/83 and UE&C specification 9763-006-248-51, Revision 10, paragraphs 3.5.8.4 and 3.5.8.5. The inspector further reviewed document packages indicating that the systems in question had been analyzed for maximum stresses that could be induced due to cold pull and that it was determined that pipe supports were not the cause of misalignment of installed systems. The inspector concludes that the action taken is in conformance with the licensee's final report to the USNRC, R-I, dated June 11,1984 (SBN-666).

This CDR is considered to be closed.

- i. (Closed) Potentially Generic Issue regarding the seismic qualification of the containment air locks supplied by the W.J.Woolley Company. Licensee investigation revealed that the Woolley air locks in question use inflatable type seals for which the pneumatic supply system was not seismically qualified. At Seabrook, the Woolley air locks use compressible type seals for which there is no problem. This generic concern is not applicable to Seabrook.

#### 4. Document Review (Units 1 & 2)

- a. The inspector reviewed Administrative Procedure, AP-15 (Revision 21) concerning Project Design Changes and the related supplemental information on Technical Procedure, TP-23 (Revision 3). An NRC question regarding use of the checker function on Engineering Change Authorizations (ECA) to provide design concurrence was answered on Blue Sheet 072, confirming compliance with the commitments to ANSI Standard N45.2.11. The inspector spot-checked a number of ECAs issued to Revision 21 of AP-15 and verified proper concurrence, approval, and inter-discipline review.

For a smaller sample of ECAs, the inspector reviewed the design change dispositions against existing specifications and general drawing notes. Selected engineering and QA personnel were interviewed regarding the design change control process.

No violations were identified.

- b. The inspector reviewed the latest revision(10/29/84) of the YAEC Field Quality Assurance Group Manual and Procedure. A total of eleven procedures were evaluated against commitments made in the Seabrook Station FSAR,

Chapter 17. The inspector checked the procedural controls and requirements for areas which might be affected by the recent management and organization changes at Seabrook. The establishment of New Hampshire Yankee appears to have had no impact upon the YAEC Field QA organization, to include the Construction QA Manager and his entire staff. Routine lines of authority, communication, and responsibility remain the same at the QA staff working level.

No violations were identified.

#### 5. ASME Code Case Commitments (Units 1 & 2)

During the random inspection of ECA documents, the inspector noted that ECA 19/100008A waived hydrostatic testing of certain portions of the Containment Building Spray (CBS) piping by invoking ASME Code Case N-237 (Revision 1). By letter from the NRC Division of Licensing, dated 5/30/80, the Office of Nuclear Reactor Regulation (NRR) authorized the use of Code Case N-237 at Seabrook and specified such usage should be documented in the FSAR.

Table 1.8.2 of the Seabrook Station FSAR indicates commitment to Code Case N-237 (Revision 0) which is more restrictive than Revision 1 in that the subject CBS piping would require additional nondestructive examination (ie: liquid penetrant testing) in order to waive the hydrostatic tests. Additionally, the FSAR in section 1.8 documents conformance to USNRC Regulatory Guide 1.84 (all revisions), implying compliance to the latest revision, which endorses Code Case N-237 (Revision 2).

Discussion with the licensee engineering, licensing, and QA personnel revealed a need for further coordination between the written commitments in the FSAR and the criteria actually being used by engineering personnel in developing design changes. From a technical standpoint, the NRC inspector sees no problem with the actual use of Code Case N-237 (Revision 1), as indicated in ECA 19/100008A, since this revision also had been endorsed by the NRC. However, from a commitment standpoint, the FSAR does not reflect the correct revision of Code Case N-237. If the Code Case has not yet been approved for use, the licensee agrees that case-by-case authorization from NRR is required.

Pending action by the licensee to amend the FSAR to reflect the actual editions and revisions of ASME Code Cases in use at Seabrook Station, this issue is unresolved (443/84-13-01).

#### 6. Observation of Welding and Review of Records (Unit 1)

The inspector observed seal welding of a valve to nipple assembly to be used on the upstream flange of an orifice plate in the safety injection line inside of Unit 1 containment. The inspector verified that the heat number of the weld material being consumed matched those on the process sheet and the weld material issue slip. The Welding Procedure Specification (WPS) was at the work location and the welder was certified to the procedure.

The work package contained Field Instruction, FI-189, Revision 4, which stated that teflon tape would no longer be an approved lubricant. ECA 73/2654C, specifies that teflon tape is not to be used in certain areas of the facility. However, neither the Field Instruction nor the ECA specify the removal of the tape in those areas where teflon tape may have been installed prior to the issuance of the Field Instruction.

This item is unresolved pending the licensee's resolution of Blue Sheet No.074 dated 10/16/84, addressing the question of whether and how retrofit removal of teflon tape is being controlled (443/84-13-02).

#### 7. Steam Generator Lateral Support Structures (Unit 1)

The inspector reviewed the status of in-process installation activities for the steam generator lateral support structures (upper and lower) and the support legs within Unit 1 containment. He visually examined some high-strength bolted splice connections and some anchor-bolted assemblies and reviewed QA records relative to material and installation activities. The following design, erection and control documents from each affected organization were utilized to evaluate the installation processes:

<u>UE&amp;C</u>	<u>Westinghouse</u>	<u>Pullman-Higgins</u>
--Specification 263-2	--Specification G-952628	--Field Instruction, FI-120
--ECA 01/2355D	--Drawings 1186F47, F48,	(Revision 2)
--ECA 01/2374D	F49, F50, F51, F54 &	--Nonconformance Report
--ECA 08/1093D	F55	(NCR) 591
--Drawing F101410	--Erection Guide (Foreign	
	Print, FP52511)	

The inspector identified some apparent inconsistencies between the UE&C and Westinghouse design documents as follows:

- (1) Westinghouse drawing 1186F47 (FP 50588) indicates in the general notes that anchor bolts shall be ASTM A540, B23, CL40 with a minimum 115 Ksi yield strength. (Note: ASTM A540 bolts are charpy impact tested). UE&C drawing F101410 allows the substitution of ASTM A193 anchor bolts for the required A540 bolts. ASTM A193 anchor bolts have a minimum yield strength of only 105 Ksi and are not charpy impact tested by the normal ASTM requirements.
- (2) A UE&C response to a Pullman-Higgins (P-H) request for information, RFI 73/4459A, indicates compliance with Specification 248-43 for ASME Class 1, pipe support material in specifying no impact test requirements for the supply of field bulk stock. However, 3/4" thick, carbon steel plate material from the ASME field bulk stock was utilized in several steam generator leg support assemblies, despite Westinghouse design requirements (G-952628 and drawing 1186F49) illustrating impact tested material to be used in the same assemblies.

The above two examples of interface questions between the UE&C and Westinghouse design requirements have been referred to the responsible engineering personnel and remain unresolved until the apparent inconsistencies are clarified (443/84-13-03).

In reviewing the QA records for the steam generator lateral support installation processes, the inspector noted that sufficient records did not appear to exist to furnish evidence of compliance with the requirements of the ECA 01/2374 series. Only one set of torque records exists, while the design change details indicate the splice connection bolts had to be relaxed and retorqued to allow for shim installation. Also, the records indicate two different torque values (200 ft-lbs vs 2000 ft-lbs) were used on the different sets of bolts, placing in doubt whether the ECA procedural requirements were consistently followed.

The inspector attempted to establish traceability for the ASTM A540 steam generator lateral support splice bolts directly from markings on the bolt heads to the material certifications in the Westinghouse record packages. While Westinghouse Quality Release QR 36012 was lacking such traceability, a P-H Nonconformance Report (591) had previously identified this discrepancy and the required traceability was provided thru Southern Bolt letter (2/13/81) crossreferencing heat numbers to bolt markings. Disposition to the NCR specified that revision to the Westinghouse quality releases must be accomplished at some later date. However, the NCR was closed and the QA records for the subject quality releases were never revised.

During an exit meeting on 10/26/84, the inspector informed the licensee Field QA manager and representatives from both UE&C and Westinghouse that the existing QA records for the steam generator lateral support installation were deficient in that the correct installation process could not be verified and that bolt heat number traceability had not been incorporated into the final quality release records package. This failure represents a violation of 10CFR50, Appendix B, Criterion XVII (443/84-13-04).

8. Observation of Cable Terminations and Review of Documentation (Unit 1)

The inspector reviewed Field Electrical Procedure, FEP-505, Revision 0, dated 6/15/84, with addendum 1 thru 11 and exhibits I thru XIII. Review of procedures at the work location established that the procedures were current. Random observation of cables being terminated indicated that cable tag numbers were being checked against the termination slips. Discussions with the electricians established that they were aware of procedural requirements.

No violations were identified.

9. Observation of Pipe Support Welding (Unit 1)

The inspector observed the welding of several pipe supports located inside of Unit 1 containment. Welders were certified to the welding procedure specifications in use. Visual examination of welds revealed no apparent defects. Work packages were complete and contained current drawings. Portable weld rod caddies were being properly utilized.

No violations were identified.



10. Instrumentation Procedures and Installation (Unit 1)

- a. The inspector reviewed some of the UE&C Field Instrumentation Procedures (FIPs) and spot-checked some field installation activities (eg: seal table class 1 support erection) for compliance. A sample of recent ECAs were evaluated against the applicable "Tubing Details" of UE&C drawing M504601. The inspector also discussed the new FIP procedural controls with engineering, QC, and craft personnel.

With regard to a recent revision (9/5/84) to FIP-18, the seismic nonsafety installation/inspection procedure, the inspector noted the use of support configuration verifications by engineering personnel. At the time of the NRC inspector's review, however, the control of this verification process had not been completely defined, to include appropriate qualification of the engineering personnel and method of documenting the verification inspections. Discussion with licensee Construction QA Manager resulted in a hold being established for all engineering verification activities until complete controls were in place. Subsequently, the inspector noted that I&C Technical Bulletin Number 1 was issued to scope the engineering verification process and provide acceptance criteria and documentation requirements. Also, FIP-18 was revised again on 9/19/84 to include the program for certification of the engineering personnel who perform support configuration verifications. The inspector had no further questions regarding FIP-18.

With regard to a recent revision (8/30/84) to FIP-9 regarding visual welding inspection, the inspector noted that the fit-up and tack installation step had been eliminated as a mandatory hold point as a result of adopting ASME Code Case N-302 for site use. This resulted in a change to the way QC would verify consumed weld material. However, this programmatic QC change was not recognized by the written requirements of FIP-9. Also, since the fit-up and tack step had been made a nonmandatory hold point, ASME class tubing would be affected when in fact Code Case N-302 had only been invoked for support installation only. Also, the ASME Boiler & Pressure Vessel Code did not exempt pressure boundaries from fit-up inspection.

Discussion of these apparent inconsistencies with QA personnel resulted in additional changes to both FIP-9 and FIP-6 (both on 10/26/84) which clarified the weld material verification control process, reinstated the mandatory fit-up and tack hold point for piping components, and specified how tack weld and fit-up requirements would be handled for supports.

The inspector confirmed that no ASME tubing welding installation had been performed during the period when the questionable FIP-9 revision was in effect. No violations were identified.

- b. The inspector noted that several design changes (ECAs 05/2401, 2423 & 2478) had been effected to downgrade instrument tubing running to non-Class 1E instruments from an ASME Code Class categorization to a non-nuclear safety ANSI B31.1 designation. This reclassification would apply to the tubing downstream of the isolation valve in the tubing line, tapping into the ASME process piping.

The inspector questioned whether the tubing downgrade met the intent of USNRC Regulatory Guide 1.151, position C.2.b for "instrument sensing lines that are connected to ASME Class 1 or 2 process piping or vessels and that are used to actuate or monitor safety-related systems---". Also questioned was whether the non-Class 1E instruments, connected to the downgraded tubing, were being treated in accordance with the provisions of Regulatory Guide (RG) 1.97 with respect to equipment qualification to a harsh environment and the application of the appropriate quality assurance.

As an example the inspector selected a flow transmitter (FT918) in the equipment vault, which measures safety injection flow in line SI-250, downstream of the discharge of the "A" train safety injection pump. In this example, the transmitter would be non-Class 1E, the tubing downstream of manual valves V99 & V100 would be downgraded from ASME to B31.1, the transmitter would not be qualified for a harsh environment and the nonsafety QA program would apply to its installation. However, since the transmitter in question is classified as a Type D variable, Category 2 criteria of RG 1.97 would apply. The inspector discussed the application of these criteria with both licensee senior engineering personnel and NRR reviewers and determined that each exception from RG 1.97 must be treated on a case-by-case basis and evaluated as such. The licensee has not yet submitted their RG 1.97 equipment list. From a QA standpoint the licensee agrees that a "graded QA" program must be applied to the Category 2 equipment of RG 1.97. They are currently developing a position for establishing such a program. Pending NRC review of the total licensee position with regard to equipment qualification and QA to RG 1.97 and instrument tubing downgrade to RG 1.151, this issue remains unresolved (443/84-13-05).

#### 11. Observation of Cable Installation and Review of Procedures

The inspector observed the installation of six safety related cables inside of Unit 1 containment and examined the QC cable installation report for each cable installed and verified that the Casp Slip Issue No. matched the report. Cables were being installed in accordance with FEP 504, Revision 0, dated 7/10/84.

Examination of controlled copy Field Electrical Procedure FEP 504 located at the work area established that the cable foreman's copy had not been updated to include four Interim Procedure Changes. However, review of the QC inspector's controlled copy established that these changes had been posted.

The inspector brought this matter to the attention of the licensee's representatives. The immediate corrective action taken was to retrieve the controlled copies of all electrical procedures and verify and/or update the procedures to assure that they are current. Discussion with the licensee's representatives indicated that this was an isolated case that may have been caused by the implementation of new (FEP) procedures.

The inspector has no further concerns in this area at this time. No violations were identified.

12. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of violations or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs 5,6,7, and 10.

13. 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.

During one of these meetings the NRC inspector announced the termination of the practice of routinely sending inspection reports to licensees for review for proprietary information. The inspector requested that the licensee inform him if any of the inspection matter was of a proprietary nature. During this inspection, the NRC inspectors received no comments from the licensee that any of their inspection items or issues contained proprietary information.

- b. On 10/16/84, the resident inspectors met with licensee personnel to discuss the program for reporting and closing Construction Deficiency Reports regulated by 10CFR50.55(e). Those CDRs remaining open thru 1982 were specifically discussed and the licensee program for involving the QA staff in verifying item close-out, prior to submittal of any final report to the NRC, was confirmed. Future 10CFR50.55(e) meetings will be held as necessary.