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

Region I

Report No. 50-443/81-05
50-444/81-05

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: April 6-May 8,1981

Inspectors: A.C. Cerne — 5/8/81
A.C.Cerne, Sr. Resident Inspector — date signed

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Approved by: R.M. Gallo — 5/21/81
R.M.Gallo, Chief, Projects Section 1A, — date signed
Division of Resident and Project Inspection

Inspection Summary:
Unit 1 Inspection on April 6-May 8,1981 (Report No. 50-443/81-05)
Areas Inspected: Routine inspection by the resident inspector of work activities relative to structural steel erection and welding, pipe welding and support erection, equipment support installation, and component installation. The inspector also performed plant inspection-tours and reviewed licensee action on previously identified items. The inspection involved 75 inspector-hours, including eight off-shift hours, by the NRC Resident Inspector.
Results: Of the four areas inspected, two items of noncompliance were identified in one area, as follows: Failure to consider specification and code requirements for weld ISI in the approval of a pipe support installation (paragraph 6b); and Failure to utilize a properly qualified Weld Procedure for the welding of a flued head to a containment penetration sleeve (paragraph 6a).
Unit 2 Inspection on April 6-May 8,1981 (Report No. 50-444/81-05)
Areas Inspected: Routine inspection by the resident inspector of work activities observed during plant inspection-tours. The inspector also reviewed licensee action on previously identified items. The inspection involved six inspector-hours by the NRC Resident Inspector.
Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

Yankee Atomic Electric Company
F. W. Bean, QA Engineer
B. B. Beckley, Manager of Nuclear Projects (PSNH - Manchester)
D. L. Covill, QA Engineer
J. DeVincentis, Project Manager (Framingham)
W. J. Gagnon, QA Engineer
D. E. Groves, QA Engineer (Framingham)
J. H. Herrin, Site Manager (PSNH)
D. A. Maidrand, Project Engineer (Framingham)
G. F. McDonald, Jr., QA Engineer (Framingham)
W. J. Miller, QA Manager (Framingham)
J. W. Singleton, Field QA Manager

United Engineers and Constructors (UE&C)
A. H. Ayers, QA Engineer
R. H. Beaumont, QA Engineer
R. L. Brown, Assistant Liaison Engineer
F. A. Cromer, Field Piping Engineer
J. A. Grusetskie, Assistant Liaison Engineer
R. A. Hopley, Field Engineer
R. A. Kountz, Welding Superintendent
D. C. Lambert, Field Superintendent of QA
R. C. Lesnefsky, Supervising QA Engineer (Philadelphia)
D. A. Mehta, Lead Structural Engineer (Philadelphia)
R. A. Mills, Assistant Liaison Engineer
J. J. Murphy, Field Engineer
R. R. Thomas, Office Engineer

Cives Steel
J. J. Corson, Field Representative

F. W. Hake, Inc.
R. O. Davis, Project Manager
R. Ellis, QA Engineer

Pittsburgh DesMoines Steel Co. (PDM)
W. A. Stiger, QA Manager

Perini Power Constructors (PPC)
G. T. Hammond, Structural Engineer
A. G. Schroeder, Lead Structural Inspector

Royal Insurance
J. C. Anzivino, Authorized Nuclear Inspector

Pullman-Higgins (Pullman)
R. G. Davis, Field QA Manager
R. R. Donald, Field QA Supervisor
C. Gaskell, QA Welding Engineer
D. R. Geske, QC Supervisor
J. Godleski, QA Records Supervisor
P. Grasewicz, Lead Hanger Engineer
M. MacCrae, NDE Supervisor
C. Scannell, Chief Field Engineer

Westinghouse
R. Powell, Project Manager
C. E. Walker, Liaison Engineer

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

The inspector observed work activities in-progress, completed work and plant status in several areas of the plant during general inspections of the plant. The inspector 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 inspector interviewed craft personnel, supervision, and quality inspection personnel as such personnel were available in the work areas.

No items of noncompliance were identified.

3. Licensee Action on Previous Inspection Findings

a. (Closed) Infraction (443 and 444/79-08-03): Corrective action verification. The inspector reviewed Revision 7 to the YAEC QA Manual Procedure 8.1. Utilization of a form entitled, "Summary and Status of Corrective Action", has been directed to track the status of audit findings requiring corrective action to completion. Distribution of this summary to management for review is required on a periodic basis as an aid in the evaluation of overall program effectiveness. Responsibility for the conduct of necessary corrective action has been procedurally defined. The inspector has no further questions on this item.

b. (Closed) Unresolved item (443/81-03-03): Questions on crossover leg support adequacy. The inspector reviewed a representative sample of the Cives shop drawings, which had been approved by UE&C, for the crossover leg supports. The designation of certain weld joints as single bevel groove, instead of vee groove, welds was verified to be in conformance with AWS Standard D1.1. Requirements for the use of groove weld backing strips and the substitution of stiffeners for a middle flange were discussed with engineering, vendor, and QA personnel. The Engineering Change Authorization in question has been revised to ECA 01/1775C to clarify acceptable as-built conditions. The adequacy of the records identifying method and scope of NDE has been audited by licensee QA personnel and further follow-up and corrective action have been generated by licensee QA program controls.

An additional question regarding the applicability of those portions of the pertinent UE&C Specification (12-5) that require further NDE of built-up girders has been answered to indicate final weld NDE has been accomplished in accordance with specification requirements.

Based upon the evidence of engineering acceptance of the as-built configurations of the crossover leg supports to include design review of vendor modifications, this item is considered resolved.

c. (Closed) Unresolved item (443/81-03-04): Conflict between the RPV support installation and the ASME Code. The licensee determined that the installation requirements of the ASME B&PV Code, Section III, Subsection NF, through the Winter 77 Addenda, apply to the questioned RPV support connections. The inspector verified that plate washers have been installed, quantitative torquing values have been defined, and a method of locking the nuts has been engineered and provided. The current configuration and RPV support installation meet Code requirements and the inspector has no further questions on this issue.

4. Evaluation of Potential 50.55(e) Item (Unit 1)

The following item reported by the licensee as potentially reportable under 10CFR50.55(e) was subsequently evaluated as either not "significant" or not capable of having "adversely affected the safety of operations" and therefore as not reportable under those regulatory requirements.

-- Fillet welds for structural steel connections to insert plates do not meet minimum AISC size specifications: The adequacy of existing welds was verified by testing, both by micro-etching test coupons for soundness and by Magnetic Particle Examination of a sample of production welds. While test results did indicate structural and design adequacy, field welding to upgrade the weld sizes to minimum AISC requirements was also accomplished.

The inspector reviewed licensee and A/E reports on the above issue and specifically evaluated the justification for the eventual decision of nonreportability with regard to 10CFR50.55(e). He has no further questions on this aspect of this item.

5. Structural Steel Erection and Welding (Unit 1)

The inspector randomly examined several bolted and welded connections on the annulus structural steel within Unit 1 containment. He witnessed welding in progress, reviewed the Perini Weld Data Card records, and discussed with the welders, preheat and weld size requirements. QA hold points for the inspection of in-process and final weld criteria were noted and construction controls over the welding sequence, care of the base metals, and knowledge of the proper quality criteria were evident. The inspector witnessed Magnetic Particle Examination (MPT) of some full penetration structural connection to embed welds and discussed both technique and final MPT Report documentation with the technician.

The above structural welding and NDE were evaluated with regard to the specified requirements in the following documents:

-- AWS Standard D1.1-75

-- UE&C Procedure WS-3, Revision 1

-- Perini Field Civil Construction Procedure, FCCP-156, Revision 4

High-strength bolted connection configurations were spot-checked against AISC requirements. Details for some W24 structural pieces connecting several beams to the concrete embeds at elevation 0 were checked against the governing UE&C Drawing F102324, Revision 3, and the Cives installation drawings (UE&C Foreign Print FP 15109-20, Sheets E101, E104, and E121). The Perini documentation control over the Structural Steel Installation Summaries which log the bolted connection status for the W24 pieces was examined and discussed with the responsible structural engineer.

The as-built condition of two bolted connections on azimuths 50° and 110° and elevations -14 and -16 respectively were examined with regard to the disposition requirements of Perini nonconformance report, NCR 1471, Revision 1. The inspector questioned whether the modifications dictated by the NCR were in fact necessary at the 110° azimuth location. After recheck by QA personnel, the existing configuration was determined to be in agreement with original design requirements and Revision 2 to NCR 1471 was issued to clarify this finding. With regard to the NCR disposition in general, the inspector verified that the directed allowance for slotting the holes in the structural members had taken into account a reduction in the allowable shear stresses which could be tolerated in these friction-type connections. He had no further questions on these issues.

With regard to the above areas of inspection on the annulus structural steel welding, NDE, and bolting, no items of noncompliance were identified.

6. Safety-Related Piping (Unit 1)

a. Welding

The inspector observed in-process welding on the following pipe spools:

-- 1-CS-369-07, Field Weld F0704
-- 1-CS-421-01, Field Weld F0102
-- 1-SW-1802-05, Field Weld F0505
-- 1-SL-X15-01, Field Weld F0101 (flued head)

Field Weld Process Sheets and Weld Rod Stores Requisitions were checked to verify identification, documentation, and inspection of criteria procedurally required for quality welding. Actual welding conditions and conduct, the sequence of operations, and the use and documentation of purge dams were all spot-checked. The inspector noted the presence or availability of QC welding inspectors and checked their inspection verification of hold point items on the weld process sheets.

For a completed weld of a Class 1 Valve (LC-V-459) into its piping line (1-RC-97-02, Field Weld F0201), the inspector reviewed the following drawings to determine conformance to code class boundary specifications, weld end prep configuration details, and NDE requirements per ASME B&PV Code, Sections III and V.

-- UE&C Drawings D800097 (Revision 5) and D805000

-- Pullman Isometric RC-97-02 (Revision 1)

-- Dravo Sketch E2936-1297 (Revision 1)

For field weld F0102 (CS-421 Line) listed above, which installed a Tufline Valve (V-266) into its pipe line, the inspector noted special techniques being utilized to maintain the valve body below a certain temperature during the welding. He verified that these techniques were procedurally defined and controlled by Pullman Field Instruction FI-77, Revision 1. Welding Procedure Specification (WPS) controls for all the above welding were examined and the WPS and procedure listed below were reviewed for conformance of the actual, essential welding variables to procedures qualified in accordance with the ASME B&PV Code, Section IX.

-- WPS 24-III-8-KI-12

-- WPS CL1-1-8R-2

-- WPS 81-III-8/1-0B-12

-- Pullman General Welding Standard, GWS-III

Inspection of all the above areas and welding items resulted in no items of noncompliance, except as noted below.

The inspector noted that the welding of flued head penetration X-15 to its containment liner penetration sleeve was procedurally controlled by WPS 81-III-8/1-0B-12. This weld specification was qualified for dissimilar metal welds (P-No.8 to P-No.1 material) for thicknesses up to 5/8" on the carbon steel side. The Procedure Qualification Records (PQRs 310 and 311) for this WPS actually qualified the welding up to 4", but since no impact (notch-toughness) testing was done on the coupons, the 5/8" thickness limit applied to all material for which special impact testing was a requirement.

The inspector determined through a review of UE&C drawings F101496, F101497, F805575, and F805578 that the carbon steel sleeve to which the flued head penetration was being welded was actually 0.937" thick. This sleeve was classified in UE&C Specification 248-43 (Revision 5) as part of the containment liner and therefore under the jurisdiction of the ASME B&PV Code, Section III, Division 2. Since ASME III, Division 2 requires impact tests of the base metal weld heat-affected zone of P-No.1 material for procedure qualification of welding on carbon steel thicknesses greater than 5/8", the inspector informed the licensee that this failure to use a properly qualified procedure for the welding process on flued head penetration X-15 represented a noncompliance with regard to 10CFR50, Appendix B, Criterion IX (443/81-05-01). This noncompliance was discussed with the licensee Field QA Manager at an exit interview on May 6,1981 and the inspector learned that a licensee hold had been placed on all affected flued

head welding.

In checking into the impact test requirements for the containment penetration sleeves, the inspector was able to verify by examination of the material certifications that the sleeve material itself, supplied by the Kawasaki Steel Corporation in Japan, had been impact tested and met all relevant material specifications. In general, the inspector reviewed the availability of containment liner material certification, assembly, and test records from the Japanese supplier and found both traceability and proper documentation.

b. Pipe Supports

The inspector checked the in-place condition, either final accepted or still in process, of the following pipe supports and compared them with their Pullman detail drawings:

-- 775-RG-3
-- 775-SV-14
-- 775-RG-15
-- MS-1201-A12

The inspector checked hanger material and weld dimensions, identification, and configuration. Where welding was in progress, he examined the Pullman Hanger Field Weld Process Sheets and Weld Rod Stores Requisitions for documentation of the correct weld joint status and usage of specified weld material. The welders were aware of and had available the field instruction governing the increase in fillet weld sizes based upon obtuse angled hanger joint configurations.

Upon review of Pullman hanger drawing MS-1201-A12 (Revision 5A), the inspector noted that the hanger being field welded was designed to support piping in the Residual Heat Removal (RHR) system (1-RH-158-2-601-8"). The hanger installation had been additionally authorized by UE&C Engineering Change Authorization (ECA) 19/0205A which allowed the harger to be placed directly between two circumferential pipe welds 5" apart, while exempting line 158 from in-service inspection (ISI) requirements. However, UE&C Specification 248-1 (Revision 4) indicates in the material section for this line that the design pressure and temperature parameters exceed those allowed by the quoted exemption. Both 10CFR50.55a and UE&C Specification IS-1 designate ASME B&PV Code, Section XI requirements to be defined by the pertinent articles (IWC for the class 2) of the Summer 1975 addenda to the 1974 Code for this RHR line. IWC 1220 (a) exempts components in certain systems from ISI based upon design pressure and temperature considerations, and not upon the less conservative operating pressure and temperature parameters invoked in the approval of ECA 19/0205A.

Specification IS-1 (Revision 6) additionally indicates that the design of pipe hangers and supports shall be reviewed such that no permanently installed part shall be closer than 15" to the nearest circumferential

weld, so as not to interfere with ISI access. However, the installation of part of MS-1201-A12, as reviewed and approved by ECA 19/0205A, violated these requirements. The inspector informed the licensee Field QA Manager during exit interviews on May 1 and 6,1981 that this procedural violation represented a noncompliance with regard to 10CFR50, Appendix B, Criterion V (443/81-05-02).

c. Miscellaneous

The inspector examined the field condition, material type, configuration, flow direction, and shop weld and NDE records for pipe spool piece 1-CS-366-1-2501-3"-3 and checked these items against criteria delineated in UE&C Specification 248-1 (Revision 4) and Dravo Sketch E2936-1226 (Revision 1a). He also observed the pre-installation condition and status of Limitorque Valve (1-SI-V-0047) within Unit 1 containment.

The resolution of a Pullman NCR 327 regarding repair of cracked cemert linings in installed service water piping was discussed with management personnel. The inspector verified inspection of these repair operations through review of the Field Process Sheets and discussion with QA personnel.

No items of noncompliance were identified.

7. Unit 1 Component Installation

a. Reactor Pressure Vessel (RPV)

The inspector witnessed the movement of the Unit 1 RPV through the construction opening for the equipment hatch into containment and the lifting and placement of the RPV onto its final supports within the reactor cavity. QC inspection and QA audit of this activity were verified. Certification and inspection records for the 525-ton crane load test and the MPT of crane hook for the containment polar crane, which was used for the final lifting and setting, were examined.

The following documents were reviewed to verify that the rough set of the Unit 1 RPV had met all procedural requirements:

-- Hake Field Control Procedure No. 449.2 (Revision 1)

-- Hake Field Control Procedure, FGCP-6 (Revision 1)

-- Hake Quality Assurance Procedures, QAP-8 (Revision 5) and QAP-9 (Revision 4)

-- Hake Drawings 449-RV-1 thru RV-10

No items of noncompliance were identified.

b. Polar Gantry Crane

The inspector examined portions of the completed installation and checked the material certification and testing records, and the receiving inspection report for the Unit 1 containment polar gantry crane (Mark 1-MM-CR-3), fabricated by Whiting Corporation. While the polar crane is classified as non-nuclear-safety with regard to its operability, it has been designed and has been designated for erection such that the seismic requirements of USNRC Regulatory Guide 1.29, position C2 are satisfied. Specifically, the inspector checked material, NDE, and specified QA requirements against UE&C Specification 257-2 (Revision 7) and UE&C Procedures MPS-2 (Revision 3), WS-3 (Revision 1), and QAS-2 (Revision 4). Erection to include bolt type and torquing, and QC inspection records was evaluated against UE&C Specification 263-4 (Revision 2), Hake Field Control Procedure 449.1 (Revision 3) and UE&C Procedure QAS-4 (Revision 1).

The inspector determined that a requirement for impact testing of the crane bolting material, imposed by Specification 257-2, had in fact been waived prior to delivery of the crane, by engineering discussions between UE&C and Whiting. ECA 08/1162C was written and approved on May 6,1981 to clarify this waiver and eliminate this bolt impact testing requirement from the crane specification.

The inspector has no further questions regarding construction of the polar gantry crane for Unit 1 at this time. No items of noncompliance were identified.

8. Unit 1 Equipment Supports

a. Pressurizer

The inspector examined the in-place condition of the embedded plates and anchor bolts for the Unit 1 pressurizer (1-RC-E-10) supports located at elevation 0 within containment. Anchor plate and bolt size, configuration, and the dimensional relationship to the concrete interface were checked, as was fillet weld size and completeness.

The following drawings were reviewed for inspection criteria:

-- UE&C drawings F101406 (Revision 4), F101413 (Revision 9), and F101418 (Revision 9)

-- Westinghouse drawing 1101J83 (UE&C FP50050)

No items of noncompliance were identified.

b. Control Room Equipment Supports

The inspector examined the design, condition, welding, and configuration of C6 channels embedded in the Control Room floor, elevation 75 in

the Control Building, both before and after concrete placement. Material thickness, method of anchoring, and weld sizes were all spot-checked. Anchor channel fabrication records, to include chemical and physical test reports, weld rod certification, and QA inspection, were inspected. The inspector reviewed UE&C drawings F101347 (Revision 3), F101351 (Revision 4), and F101699 and evaluated all the inspection items with regard to criteria delineated in the following documents:

-- UE&C Specification 18-1 (Revision 5)

-- UE&C Procedure WS-3 (Revision 1)

-- AWS Standard D1.1-75

No items of noncompliance were identified.

c. Regenerative Heat Exchanger

The inspector examined the installed, but not finally accepted, condition of the Unit 1 Regenerative Heat Exchanger 1-CS-E-2 on its wall supports within containment. Bolt minimum edge distances, fillet weld sizes, and dissimilar metal welds on the supports were checked, as was the preventive maintenance record on the heat exchanger itself. Material certifications and the code data report from the fabricator (Atlas), hydro-test and air bubble inspection reports, weld rod certifications and NDE reports were all reviewed.

In evaluating the overall installation of the Regenerative Heat Exchanger on its supports, the following documents were examined:

-- UE&C Specifications 248-51 (Revision 7) and 263-2 (Revision 2)

-- UE&C drawings F101418 (Revision 9) and F805051 (Revision 6)

-- Atlas drawing D-4313-7 (UE&C FP50257)

-- Pullman Procedure IX-39

-- ASME B&PV Code, Section III, Subsection NF and Appendix XVII

The inspector also reviewed the handling of a nonconforming condition involving the misplacement of the embedded wall support anchor bolts, which was identified and dispositioned by Perini NCRs 59/1388 and 59/1388 (Revision 1). While final installation of the heat exchanger supports appears to have been accomplished in accordance with the NCR disposition requirements, the inspector raised the following questions regarding the installation process and existing as-built condition.

-- Why no torque requirements were imposed on the ASTM A-193 high strength anchor bolts as required by ECA 01/1875C?

-- What justifies the final configuration of the long-slotted bolt holes, which were made in the support plate and documented per Pullman FCR 1609A, in apparent conflict with ASME III, Subsection NF requirements for the direction of the slots?

These questions were discussed with the licensee Field QA Manager at exit interviews on May 1 and 6,1981. Pending clarification of the apparent conflict with ASME III, NF and the apparent nonconformity with procedural requirements for torquing, this item is unresolved (443/81-05-03).

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 8c.

10. Management Meetings

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.