

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

Report No. 50-443/81-01 Region I
50-444/81-01
Docket No. 50-443
50-444
License No. CPPR-135 Priority -- Category A
CPPR-136

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; January 2-30, 1981

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

Feb 6, 1981
date signed

FDR: AC Cerne
R.A. McBrearty, Reactor Inspector

Feb 13, 1981
date signed

FDR: AC Cerne
W.F. Sanders, Reactor Inspector

Feb 13, 1981
date signed

L.E. Tripp, Chief, Engineering Support
Section #1, RC&ES Branch

Approved by: Louis Mattia
J.C. Mattia, Acting Chief, Projects
Section, RC&ES Branch

2/17/81
date signed

Inspection Summary:

Unit 1 Inspection on January 2-30, 1981 (Report No. 50-443/81-01)

Areas Inspected: Routine inspection by the resident inspector and two regional based inspectors of work activities relative to safety related components and records; RPV internals; structural steel and polar crane rail welding and rail repair; pipe support welding; and review of the licensee evaluation of two potential 50.55(e) items. The inspectors also performed plant inspection-tours and reviewed licensee action on previously identified items. The inspection involved 85 inspector-hours, including five off-shift hours, by three NRC inspectors and one NRC supervisor.

Results: Of the five areas inspected, one item of noncompliance was identified in each of the two following areas: Failure to include appropriate weld acceptance criteria in the field hanger drawing (paragraph 7) and failure to follow procedure in acceptance of undersized fillet weld (paragraph 6)

Unit 2 Inspection on January 2-30, 1981 (Report No. 50-444/81-01)

Areas Inspected: Routine inspection by the resident inspector and two regional based inspectors of work activities observed during plant inspection-tours and licensee action on previously identified items. The inspection involved nine inspector-hours by three NRC inspectors and one NRC supervisor.

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)
P. B. Bohan, Senior Engineer (PSNH)
D. L. Covill, QA Engineer
W. J. Gagnon, QA Engineer
J. H. Herrin, Site Manager (PSNH)
R. C. Julian, QA Engineer
G. F. McDonald, Jr., QA Engineer (Westborough)
W. J. Miller, QA Manager (Westborough)
J. F. Nay, Jr., QA Engineer
J. W. Singleton, Field QA Manager
H. E. Wingate, Project Engineer (Westborough)

United Engineers and Constructors (UE&C)

W. S. Aregood, QA Engineer
R. H. Beaumont, QA Engineer
R. L. Brown, Assistant Liaison Engineer
J. J. Carrabba, Storage Material Control Supervisor
M. A. Edgar, Resident Construction Engineer
A. R. Hanley, Instrument Technician
C. H. Jameson, QA Engineer
D. C. Lambert, Field Superintendent of QA
R. A. Mills, Assistant Liaison Engineer
G. Shaw, Structural Steel Superintendent
R. D. Tancibok, QA Supervisor

F. W. Hake, Inc.

R. Ellis, QA Engineer

Perini Power Constructors (PPC)

E. M. Kavanaugh, NCR Coordinator
J. D. Pattison, Supervising QA Engineer
C. T. Reynolds, QA Engineer
A. G. Schroeder, Lead Structural Inspector

Royal Insurance

J. C. Anzivino, Authorized Nuclear Inspector

Pullman-Higgins (Pullman)

R. G. Davis, Field QA Manager
A. A. Eck, Director of QA (Corporate)
D. Geske, NDE Supervisor
C. Scannell, Chief Field Engineer
P. Grasewicz, Lead Hanger Engineer

2. Plant 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 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 such as personnel were available in the work areas.

Specifically, one inspector observed rigging, handling, and placement of one diesel generator in its final building location and electrical activity to activate the internal strip heaters on another diesel generator already in place and in storage status. The installation and tolerances of rebar were spot-checked prior to a concrete placement for a slab at elevation 25' in the Primary Auxiliary Building. Certain rebar dowels were verified to be of correct size, length, and position in accordance with the following drawings:

- UE&C Drawings F101503 (Revision 0) and F101543 (Revision 3)
- Bethlehem Steel Drawing 030-R30

Welding of permanent attachments to the Unit 1 containment liner was observed and discussed with the welder. The inspector also discussed with another individual a concern that certain pipe welding supervisors had performed welding on pipe to demonstrate techniques, even though they had not been qualified for such welding. Further inquiry revealed that the welding supervisors often verbally instruct and demonstrate proper techniques to the pipe welders, but that the supervisors themselves do not strike an arc or weld. This was corroborated by QC inspector personnel.

The inspector witnessed removal of the temporary dome from Unit 1 containment, the rigging and placement of polar crane parts inside containment, and the conduct of certain safety related activities (eg: welding) on the evening work shift within the Unit 1 containment building.

No items of noncompliance were identified.

3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved item (444/79-07-04): Dew Point and baffle cavity measurements. Records were reviewed which confirmed that the dew point is monitored in the reactor vessel internals storage area. Calculations are made on a weekly basis using data recorded on the temperature/humidity charts. The recorded data are used in conjunction with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Psychrometric Chart No. 2 to determine the dew point at a selected time.

The licensee supplied a memo from Westinghouse Electric Corporation to Public

Service Company of New Hampshire delineating the requirement for obtaining baffle cavity measurements and the use to which the data are put by Westinghouse engineering personnel.

Based on the above, the item is considered closed.

(Open) Unresolved item (443/80-12-02): Contractor interface controls.

a. Contractors

An inspection was made of the procedural controls in use for the identification, corrective action and disposition of damage or nonconforming items which may be revealed after the responsible contractor has completed his work, or discovered by another contractor who has related follow up work (Structural Steel/Concrete) or contractors who do not have related work (Painters/Insulators).

The inspector noted by a review of correspondence that meetings were held between YAEC and UE&C Project and QA Management and directives sent to the Site Contractors to institute within these respective programs, the use of "Contractors Incident Interface Reports", Form No. F1865 Rev 0.

During this inspection, the programs of three contractors were reviewed for implementation of the referenced procedure with the following range of results:

- Contractor A - Specific procedure written which described the scope, purpose, responsibilities, description, use and disposition of the referenced form. This was considered to be satisfactory.
- Contractor B - The referenced form was designated as attachment XV to an existing procedure for nonconformances caused by the contractor. No instructions were found within the body of the procedure to give information and direction on the use of the form. This was not considered to be satisfactory.

b. UE&C Project Engineering

An inspection in the area of acknowledgement, logging for accountability, assignment to the respective engineering groups and disposition indicated that the interface system was in effect and working. However, procedures or instructions had not been formulated to provide control. The inspector was informed that a procedure (FACP) would be developed for this.

The licensee was informed that a future inspection would include this item for resolution and would be based on adequate contractor instruction in specific procedures or as supplements to existing QC documents with YAEC review, approval and implementation of the procedures.

(Closed) Unresolved item (443/80-13-01): Anchor bolt protection from corrosion pitting. The inspector observed the additional protective measures initiated for the SA-193 anchor bolts in the Unit 1 diesel generator building. He

reviewed the results of water chemistry tests taken as a sample at various parts of the plant where water was trapped in anchor bolt sleeves and evaluated the analysis of the corrosion effect by UE&C home office engineering. The following Perini procedures were revised by the noted Interim Procedure Changes (IPC) to clarify protection and inspection requirements for both stainless and carbon steel bolts and to establish procedural responsibility and inspection criteria for the release of embedded anchor bolts from in-place storage to the applicable equipment installation contractors.

- Field General Construction Procedure, FGCP-3 (Revision 2) revised by IPC No. 4.
- FGCP-2 (Revision 4) revised by IPC No. 2 (Revision 1).
- Quality Assurance Procedure, QAP-13.1 (Revision 3) revised by IPC No. 2.
- QAP-10.5 (Revision 3) revised by IPC No. 5.

This item is considered resolved.

(Closed) Unresolved item (443/80-09-04): Electrical channel welding qualification and control. The inspector observed electrical channel welding in the Unit 1 control building, particularly noting field control and QC inspection of fit-up and tolerances. He reviewed the current interim procedure change to the governing Fischbach Construction Procedure, FECP-403 (Revision 2) and examined the Welding Procedure Specification, F&M AWS-8 (Revision 1), as qualified by Procedure Qualification Records PQR-12 and 13 with appropriate testing and inspection reports. The PQR had included qualification of both the worst case and normal conditions with regard to essential variables set forth in AWS Standard D1.1-75.

Fischbach Nonconformance Report FBM-012 was dispositioned to accept the questionable channel welds based upon the satisfactory test results of the worst case conditions. Revised procedural controls and inspection insure future channel welding conformance to qualified specification requirements. The inspector has no further questions on this issue and considers this item closed.

4. Safety Related Components (Unit 1)

a. Observation of Work

The onsite storage area for reactor coolant pump (RCP) motors, RCP internals and steam generators was inspected to ascertain that applicable storage requirements were complied with.

RCP motors and pump internals are stored off the floor in a metal building. Temperature and relative humidity inside the building are recorded on a continuous chart, two pen recorder. The inspector noted that component heaters were activated and that tags on each component

confirmed that inspections are made on a periodic basis.

One steam generator was at the outside storage area supported by shipping cradles and wooden cribbing. Exterior surfaces were protected by a coating applied at the fabricator's plant and the interior was protected with a nitrogen blanket.

In addition to the above the Seabrook dock area was inspected and activities associated with handling and transporting a second steam generator were observed.

The inspector's observations included portions of the following activities which were within the scope of the F.W. Hake QA Program:

- Placement of the steam generator on the Hake 420 ton rated capacity, 12 axle, hydraulic semi-trailer.
- Removal of the generator from the barge.
- Delivery of the generator to the on-site storage area.

The aforementioned activities were done in the presence of F.W.Hake and licensee QA/QC personnel, and were in accordance with the licensee approved Hake procedure entitled "Jacking, Hauling, and Handling of the Unit Nos. 1 & 2 Steam Generators", and Change Notice No. SB-001 to the procedure.

No items of noncompliance were identified.

b. Record Review

The inspector reviewed documents and records to ascertain that storage conditions and inspections comply with applicable licensee and regulatory requirements. The following were included in the inspector's review:

- Preventive Maintenance Record (PMR) for RCP motor number 1-RC-P-1C
- PMR for RCP motor number 1-RC-P-1D
- PMR for RCP internals assembly number 1-RC-P-1A
- PMR for RCP internals assembly number 1-RC-P-1B
- Nitrogen purge record for steam generator number 1-RC-E-11A and 1-RC-E-11B
- Nonconformance Report (NCR) number 712
- NCR number 735
- NSSS Component Receiving and Storage Criteria and attachment 125 C
- Westinghouse NSD data letter 80-10 dated 11/5/80

The records indicate that inspections and maintenance activities such as pump motor rotor rotation are being done on a timely basis.

No items of noncompliance were identified.

5. Reactor Pressure Vessel Internals (Unit 1)

An inspection was made of the preparation and packaging of the Reactor Pressure Vessel Internals for shipment to the manufacturer. This was done to decontaminate the upper core plate assembly which had been subjected to seawater intrusion during the original barge shipment from the manufacturer. The incident is a matter of record, which was described on earlier reports and an investigation of the contaminated condition was performed by the manufacturer with the conclusion that the upper internals were satisfactory as far as chloride contamination is concerned except for the upper core plate assembly and upper support column bolt holes which must be cleaned. The general method for doing this will be to remove the guide tubes and upper core plate at the site. The guide tubes will under go additional cleaning and be stored at the site. The upper core plate is to be shipped back to the manufacturer for complete dis-assembly, cleaning and reassembly. It will then be shipped back to the site for reassembly to the upper support columns.

The inspector noted the packaging features used to preclude a reoccurrence of seawater intrusion for this shipment included the placement of 8 oz. bags of dessicant followed by wrapping the internals package in a shroud of .006 inch thick polyethylene. This package is then placed in a vinyl waterproof shipping bag, with Zip Loc sealing features. This package is then placed in a plywood container mounted on a steel shipping frame.

Inspections were made of the following items.

Packaging of the internals

Storage conditions for the lower core barrel

Visual inspection of lifting equipment and load tests of the rigging

TDC-TI-8001 - General Transfer Procedure

FDR-NAH-10005 - Attachment - Upper internals disposition

RBB 05-21-80 Rev 0 - Site Preparation and Cleaning Procedure

RBB 01-21-80 Rev 1 - Removal and Reinstallation of support pins for Guide Tubes and Flow Columns.

No items of noncompliance were identified.

6. Structural Welding (Unit 1)

- a. The inspector observed welding of the polar crane rail clamps to the rail base plate during both the first and second construction shifts. The Perini Welding Procedure Specification WPS 156.7F was reviewed and noted to be governed by AWS D1.1 prequalified fillet weld criteria. Specified preheat and interpass temperatures and minimum tack weld sizes were checked against AWS requirements. Weld Data Cards for certain joints were examined to verify the existence of appropriate inspection criteria and a final QA visual inspection hold point.

The inspector noted that during the in-process welding of one joint where additional weld metal was being deposited to strengthen a previously completed fillet weld, the Weld Data Card indicated no sign-off on the preparation, preheat, and tack weld criteria listed under the control of Perini construction supervisory personnel. The inspector reviewed Perini Field Civil Construction Procedure FCCP-156 (Revision 2) with IPCs 1 thru 5 and questioned whether mandatory sign-off of each step was required prior to production welding. The licensee and contractor issued a hold on rail welding to clarify the intent of the procedure in this regard.

The inspector's discussion with both welders and QC personnel revealed knowledge of the weld acceptance criteria. No defects were observed in the actual welding or completed welds. The licensee indicated an intent to require construction sign-off, as a minimum, of the tack weld step (ie: fit up) with a QA hold point randomly imposed to verify proper construction inspection. The inspector has no further questions on this issue at this time.

- b. The inspector noted two completed welds attaching W10 structural beams to the bottom flange of a W24 beam. The two W10 beams (Cives mark nos. 135AG and 135AH on UE&C Foreign Print FP10893, Revision 8) support a monorail over a Chemical and Volume Control system charging pump in the Primary Auxiliary Building. The applicable UE&C drawing F101550, Revision 3, indicates a 5/16" fillet weld is required, but the inspector observed that the weld fit up had brought the connecting surfaces to only within 5/32" of contact. Both AWS D1.1 and Perini FCCP-156 (Revision 2) require an increase in the fillet weld size commensurate with the separation for any gaps 1/16" or greater. Since the leg size had not been increased accordingly for the fillet weld on piece 135AG and could also be questioned on piece 135AH, and also since these welds have been signed off as acceptable by QC inspection on October 7, 1980, the inspector informed the licensee that this failure to follow procedural and AWS requirements resulted in welds of questionable strength and represented a noncompliance with regard to 10CFR50, Appendix B, Criterion V (443/81-01-01).

7. Safety Related Piping and Supports (Unit 1)

- a. The inspector witnessed grinding operations on a containment spray pipe spool piece (MK1-CBS-1216-2-301-8"-25). He verified that grinding to prep the area of transition between pipe spool pieces of different wall thickness was being accomplished in accordance with a UE&C

Engineering Change Authorization ECA 19/0142B and that the resultant taper conformed to ASME Section III requirements. A Pullman Field Process Sheet documented criteria and sequence of the grinding operation with appropriate QC inspection hold points.

The condition, configuration, material type, and attachment lug weld NDE of the above pipe spool piece were all checked against the Dravo Sketch (E2936-1829, Revision 1) and the Material Specification (301) requirements of UE&C Specification 248-1, Revision 4.

No items of noncompliance were identified.

- b. The inspector examined completed field welds (FW19,39,41, and 42) on containment spray pipe hanger no. 1226-A-17. The Pullman drawing for this hanger (Revision 6A) indicated that field welds 39 and 41 were designed as $\frac{1}{2}$ " fillet welds, but the angular tolerances for the adjoining pieces to be fillet welded were specified to be between 30° and 105°. Field welds 39 and 41 were actually welded as fillet welds between members joined at angles substantially greater than 105°. The effect of such an obtuse angle on a fillet weld of specified leg size is a reduction in throat size and therefore in the ultimate strength of the weld. The leg size was increased by verbal direction.

Discussion with both engineering and QA personnel revealed that the intent of the drawing was to locate the fillet weld on the acute angled side of the structural member interface and that a new drawing M805943S (Revision 1) clarifies angular relationships up to 135°. However, discussion with the welder indicated that, given the particular hanger configuration, he would not have been able to weld on the acute side. Furthermore, for angles greater than 150°, the existing drawing requirements do not govern welding on either the acute or obtuse sides.

A question of the generic interpretation of skewed fillet welds on ASME III, NF pipe supports was raised by the NRC as an unresolved item (443/80-06-01) in June, 1980. The inspector indicated during this current inspection that the installation of such obtuse angled pipe support welds without appropriate governing criteria on the field hanger drawing, has resulted in welds of questionable strength. While these welds had not been QC inspected, there was no assurance that QC inspection would have discovered the questionable welding, based upon given drawing requirements. The licensee was informed that this failure to provide appropriate weld acceptance criteria for such skewed fillet cases has resulted in resolution of the above open item as a noncompliance with regard to 10CFR50, Appendix B, Criterion V (443/81-01-02).

8. Polar Crane Rail Repair (Unit 1)

On a previous NRC inspection, the inspector noted the polar crane rail had been slightly damaged by weld spatter from a thermite welding operation on

a nearby rail butt joint. This had been identified and properly documented by Perini QA on nonconformance report, NCR 1352. During this current inspection, the inspector reviewed disposition of the NCR and documentation of the rail repair heat treatment process.

While the repair disposition specified a heat treatment temperature range and holding time, the actual heating process varied from these requirements because of field equipment and technique constraints. While the actual heat treatment operation was done under the supervision of a UE&C materials engineer and the resulting evaluation, MT testing, grinding and etching indicated successful removal of zones of high hardness and linear indications, the report submitted by the materials engineer differed in content from that of the QC inspector, which noted the variances from the temperatures and holding time required by the NCR disposition. The NCR disposition was subsequently revised to allow for the field variation in temperature and the NCR was closed.

While the inspector had no concerns for the ultimate quality of the crane rail after repair, he questioned both the conflicting reports documented in the NCR records package and the closure of the NCR without evidence of evaluation of the QC inspector's report of procedure variance. The licensee initiated action which resulted in the following record and procedural clarification:

- Submittal of an additional report by the UE&C materials engineer specifying the actual heat treatment technique and its acceptability.
- Imposition of a Perini QA hold point for MT inspection of the subject crane rail area after polar crane load testing.
- Issuance of an Interim Procedure Change (IPC No. 5) to Perini QAP-15.0 (Revision 2), specifying the method of handling non-conformances to NCR dispositions.

The inspector reviewed the additional information, reports, and procedure revisions and indicated to the licensee that he had no further questions on this issue.

9. Evaluation of Potential 50.55(e) Items (Units 1 and 2)

The following items reported by the licensee as potentially reportable issues under 10CFR50.55(e) were 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.

- a. Tests of 1" Hilti kwik-bolts indicate ultimate tensile strengths under the design value: Licensee investigation revealed only four 1" bolts had been installed and that these were designed for a working shear, not tensile, load. Additionally, analysis of all designs using 1" bolts indicated actual kwik-bolt tensile loads are lower than the reduced test values.

- b. Accepted rebar cadwelds found with packing material remaining in the sleeves: The licensee initiated a reinspection of all accessible cadwelds resulting in 28 (or 0.4% of the total inspected) identified with rejectable void areas. The testing of 26 of these rejected cadwelds resulted in all exceeding minimum acceptable average splice strength requirements. The low rejection rate, supported by test results indicating the existence of no defective cadwelds from a structural strength standpoint, and further statistical analysis, have led to the conclusion that no construction deficiency did in fact exist.

The inspector reviewed licensee and A/E reports on the above issues 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 these items.

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.