

U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report Nos. 50-443/82-09  
50-444/82-09

Docket Nos. 50-443  
50-444

License Nos. 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: August 24 - 27, 1982

Inspectors: A. A. Varela Sept. 13, 1982  
A. A. Varela, Reactor Engineering date  
Inspector

Approved by: J. P. Durr 9/20/82  
J. P. Durr, Chief, Materials and Processes date  
Section

Inspection Summary

Unit 1 Inspection on August 24 - 27, 1982 (Report No. 50-443/82-09)

Areas Inspected: Routine, unannounced inspection by a regional based inspector of procedures and work activities relating to concrete construction of reactor containment building dome; procedures and work activities relating to structural welding within the containment building; review of QA surveillance reports of structural steel erection and welding in Category I buildings. The inspector also reviewed licensee action on previously identified items and performed a plant inspection tour. The inspection involved 28 inspector-hours onsite.

Results: No violations were identified.

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Inspection Summary:

Unit 2 Inspection on August 24 - 27, 1982 (Report No. 50-444/82-09)

Areas Inspected: Routine unannounced inspection by a regional based inspector of licensee action on previously identified items and a plant inspection tour. The inspection involved 6 inspector-hours onsite.

Results: No violations were identified.

## DETAILS

### 1. Persons Contacted

#### Yankee Atomic Electric Company (YAEC)

- \*D. L. Covill, Lead Civil QA Engineer
- J. H. Herrin, Site Manager (PSNH)
- \*G. F. McDonald Jr., QA Manager (Framingham)
- \*W. T. Middleton, QA Engineer
- \*J. A. Philbrock, Senior Project Engineer (Framingham)
- \*J. W. Singleton, Field QA Manager
- \*R. K. Tucker, Lead Mechanical Engineer (Framingham)

#### United Engineers and Constructors (UE&C)

- R. G. Blair, Construction Superintendent/Civil Superintendent
- \*J. A. Grusetskie, Site Engineer
- \*D. C. Lambert, Field Supervisor - QA
- K. M. Kalawadia, Structural Engineer (Philadelphia)
- D. McClellan, Civil Structural Site Engineer
- R. D. Tancibok, QA Engineer
- W. Tinlan, Construction Superintendent
- J. Todd, Construction Engineer

#### U. S. NRC

- \*A. Cerne, Senior Resident Inspector

#### Perini Power Constructors (PPC)

- R. Rudala, Structural Steel Weld Supervisor
- L. Granpre, Concrete Construction Superintendent
- R. Hammer, QC Inspector Structural Welding
- R. Hart, Site QA Manager
- R. Narva, Supervising QA Engineer - Concrete
- J. Pattison, Supervising QA Eingeiner - Welding
- R. Vachon, QC Inspector - Concrete
- R. Collins, QC Inspector - Concrete

#### Pullman - Higgins (P-H)

- M. Daniels, Non-destructive Examiner - Structural Steel Welds

\*indicates attendees at exit interview August 27, 1982

The inspector conferred with other licensee, construction manager and contractor personnel during the course of the inspection.

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

The inspector observed work activities in-progress, completed work and plant status in several areas of the plants during a general inspection of construction activities. The inspector examined work for any obvious defects or noncompliance with regulatory requirements or license conditions. Inspection personnel were observed performing required inspections and those interviewed were knowledgeable in their work activities. Craft personnel, supervision and construction engineers were interviewed as such personnel were available in the work areas. Areas inspected included:

Unit 1: Containment building dome concrete cure and preparation for the next placement, structural steel erection and welding for the containment equipment hatch shield and the annulus platforms, reinforcing steel installation and form work for enclosure building wall including installation of compressible material for seismic separation between the containment and fuel storage buildings.

Unit 2: Containment building liner plate erection and tack-welding of ring sections, concrete form work and reinforcing steel installation for exterior wall of the containment building, structural fill placement and compaction over the service water lines.

No violations were identified.

3. Licensee Action on Previously Identified Items

(Closed) Unresolved Item (443 and 444/82-07-01) - Deficiencies in Concrete Specifications for Containment Dome Construction:

The specific details identified by the inspector in report 82-07 that appeared lacking in engineering specification #13-2 and implementing procedures for the Containment exterior shell concrete work at the dome were transmitted by licensee to UE&C in Blue Sheet #046A and B, Request for Follow-up Action/NRC Inspections. The UE&C responses were reviewed by the inspector and discussed with licensee and UE&C design, construction and quality personnel. The actions taken by UE&C were found acceptable. They provide adequate direction for PPC to implement construction and QA procedures for placement and inspection of the dome concrete. The corrections and/or resolutions of the deficiencies in UE&C engineering specification #13-2, as identified in report number 443 and 444/82-07, and the imposed revisions to PPC implementing procedures were found acceptable.

(Open) Follow-up Action Item/Licensee Blue Sheet #047:

During ongoing construction in Unit 1 an area of the vertical liner plate at elevation (-) 23, azimuth 350° was found that emits a "hollow" sound when struck with a hammer. The UE&C response to licensee request for follow-up action was reviewed by the inspector. The response

identifies experiences at the Seabrook site where a destructive test investigation was performed for non-shrink grout testing. They conclude that "hollow" sounds when questionable base plates were struck proved to be small air pockets, there were no voids. The inspector discussed with licensee and construction manager personnel the conclusions drawn by UE&C. They state that there is not sufficient evidence that a void exists behind the containment liner, destructive testing is not warranted and the state of the art in NDE cannot determine voids at the above location.

The inspector hammer tested the liner plate at the above location and noted that two other adjacent small areas emitted a "hollow" sound. He visited Unit #2 to observe and compare liner plate anchorage at the location (beneath the electrical penetrations) at elevation -23, azimuth 350°, where the containment exterior concrete wall had not yet been placed. Resulting from inspector observations the licensee committed to liner stress analysis for the "worst case" of possible concrete voids in back of the liner plate. This could prevent liner stud anchorage. Additionally the licensee committed to investigate the NDE technique which measures dynamic response in terms of resonant frequency and damping of the liner to an impact from a force measuring hammer. This advance in the state of the art was recently applied successfully at another nuclear site.

#### 4. Unit 1 Containment Building Dome Concrete

##### a. Work Observation - Concrete Curing and Preparations for Concrete Placement

The inspector observed completed elements of work and work in progress for concrete placement of the Unit 1 containment dome. Six concrete placements were observed completed, prior to this inspection, above the spring line. The exterior concrete surface was noted to be well formed with no indications of rock pockets, sand seams, voids or honeycomb. The last placement, completed August 20, was adequately green-cut and moist cured at the construction joint until the next pour was undertaken on the night of August 26 - 27. An approved curing compound was applied to moist concrete when forms were advanced. The following concrete preplacement quality related activities were observed and determined to be accomplished according to engineering specifications committed codes, standards and, construction and QC procedures. This containment dome concrete placement is identified as pour number 1-CS-1 JJ-1.

- reinforcing steel-properly placed, secured and specified distance from forms
- forms - properly placed, leak tight and clean
- construction joint - prepared as specified and clean
- reinforcing steel cadweld splices - QC accepted and adequately recorded

- Concrete preplacement QC inspection report-indicates status of checkout items, identifies reference drawings and cadweld splices in the placement
- concrete placement checkout card-appropriately QC verified/ signed-off and released by UE&C for the placement.

b. Record Review of Dome Concrete Placement and Observation of Curing

On August 27, 1982, the inspector reviewed QC records of containment dome concrete placement, pour number 1-CS-1 JJ-1. Moist cure of this pour also was observed. The QC records were readily retrievable and complete. They identify controls relating to monitoring of the containment liner, the liquid head of concrete, vibrator frequency and conditions of concrete pump operation. These records were observed to conform to engineering specifications #13-2 and QC procedures FIP-10 and FCCP-2.

No violations were identified in a. and b. above.

c. Unresolved Item-FSAR Lacks Identification of High Slump Special Concrete Mix Used in Containment Dome

Licensee committed at the exit interview to change the FSAR to conform to approved revisions in engineering Specification 13-2, Containment Concrete Work. Concrete slump not greater than 6" is identified in FSAR section 3.8.1.6 for special high slump concrete used in congested areas. However, as permitted by specification 13-2, Section 3.17, superplasticized concrete with slump maximum of 8" was approved by the construction manager for the containment dome. Pending appropriate revision to the FSAR this item is Unresolved (443/82-09-01 and 444/82-09-01).

5. Containment Unit 1 Steel Structures and Supports

The inspector observed these work activities and reviewed QC records relative to Unit 1 containment structural steel: receipt inspection, installation/ erection, welding, QC inspection and NDE testing. The work performed by PPC was selected for observation and record review. It pertained to the containment interior on the crane wall annulus platforms, the equipment hatch enclosure building shield and pipe restraint I-beams under steam generator "A".

a. Receipt Inspection

UE&C receiving inspection report #5476 on Structural steel 36" Wx160 beams, identifies parts number 1 F 11 0 1 A and B, received from Cives Steel Company. The receiving inspection checklist identifies satisfactory physical condition and documents traceability on receipt at the site. Transmittal documentation of the items and their

receipt on transfer to PPC is acknowledged on PPC's material receiving inspection report #I-466. The documentation was observed to be acceptable and conformed to criteria identified in UE&C QCP-7-1 VI.C.

b. Installation/Erection Structural Steel

The inspector observed the I-beams identified above to be adequately installed and temporarily supported in their final position. He reviewed the Cives Steel detail drawing, the pertinent UE&C drawing and specifications and verified the PPC weld data card for conformance to the Structural Welding Code AWS D1.1-75. These significant elements were witnessed/verified by the inspector for the field splice

- weld procedure report WPS-156.2 prequalified per AWS D1.1
- welders qualification test records - satisfactory
- welder material-request for weld rod and weld rod identification as prescribed on Weld Data Card
- weld rod heater kept at adequate temperature
- weld joint preparation - single bevel groove with backing bar for field splice of 36" W 160 beam
- weld data card - signed off by construction weld supervisor and QA at required hold point
- prescribed NDE requirement and hold points on Weld Data Card - visual, magnetic particle examination and radiographic examination conform to WPS-156.2 and AWS D1.1-75
- NDE testing by Pullman-Higgins - MT examination was observed performed by level II personnel in accordance with procedure 1X-MT-1-W77 on other structural steel welds

c. Quality Assurance Surveillance of Structural Steel Erection and Welding

Surveillance reports generated by UE&C of structural steel erection and welding performed by PPC were reviewed. Fifteen reports covering the first seven months of 1982 were observed to cover these activities pertaining to the Unit 1 containment building. The QA surveillance inspections were based on UE&C QA procedure 10.11. The reports identify and correlate with activities of this procedure and, as appropriate, with PPC erection and weld procedures. A surveillance checklist was also used on welding and bolting. The reports were observed to be clear, legible, and readily retrievable. Follow-up action was clearly noted and closed-out and, NCRs were adequately dispositioned. The QA surveillance reports by UE&C of PPC's activities in structural steel erection and welding were evaluated for their effectiveness. Five NCR's were issued by PPC based on UE&C findings, and one UE&C additional corrective action request (CAR) was necessary.

No violations were identified paragraphs 5a through c.

6. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable, violations or deviations. Two unresolved items identified during the inspection are discussed in Paragraph 4.C.

7. Exit Interview

The inspector met with licensee's representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 27, 1982, at the construction site. The inspector summarized the findings of the inspection. The licensee acknowledged the inspectors comments.