

U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 50-443/82-08
50-444/82-08

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: July 12 - August 23, 1982

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

8/31/82
date signed

E.M. Kelly
E. Kelly, Reactor Inspector

9/3/82
date signed

P. E. Harmon, Sr. PWR Instructor,
IE Training Center

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

9/3/82
date signed

Inspection Summary:

Unit 1 Inspection on July 12 - August 23, 1982 (Report No. 50-443/82-08)

Areas Inspected: Routine inspection by the resident inspector and a regional based inspector of procedures, records, and work activities relative to AWS welding; reactor coolant pressure boundary and safety-related piping runs and welding; structural steel erection; RPV internals condition and storage; and design/construction interface issues. The inspectors also reviewed licensee action on previously identified items and performed plant inspection-tours. The inspection involved 106 inspector-hours, including five off-shift hours, by two NRC inspectors. An IE Senior PWR Instructor also took part in site inspection-tours and discussions with licensee personnel on operator training.

Results: No violations were identified.

Unit 2 Inspection on July 12-August 23, 1982 (Report No. 50-444/82-08)

Areas Inspected: Routine inspection by the resident inspector and a regional based inspector of procedures, records, and work activities relative to AWS welding and design/construction interface issues. The inspectors also reviewed licensee action on previously identified items and performed plant inspection-tours. The inspection involved 20 inspector-hours by two NRC inspectors.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Yankee Atomic Electric Company (YAEC)

F. W. Bean, Lead Electrical QA Engineer
D. L. Covill, Lead Civil QA Engineer
J. H. Herrin, Site Manager (PSNH)
G. F. McDonald, Jr., QA Manager (Framingham)
J. F. Nay, Jr., Lead Mechanical QA Engineer
S. B. Sadosky, Lead Start-up/Test QA Engineer
J. W. Singleton, Field QA Manager
P. J. Swanson, Manager - Training Center (PSNH)
R. Tucker, Engineer (Framingham)

United Engineers and Constructors (UE&C)

R. H. Bryans, Site Engineering Manager
S. N. Caruso, Mechanical Analysis Senior Engineer
J. A. Grusetskie, Engineering Manager Assistant
R. A. Kountz, Welding Superintendent
D. C. Lambert, Field Superintendent of QA
D. G. McClellan, Civil/Structural Lead Engineer
D. E. McGarrigan, Manager - Project QA (Philadelphia)
M. P. McKenna, Pipe Support Supervising Discipline Engineer (Philadelphia -
D. C. Turnquist, Pipe Support Lead Engineer telephonic contact)
T. P. Vassallo, Jr., Lead QA Engineer

Johnson Controls, Inc. (JCI)

C. G. Beaulieu, Quality Engineer (Lead)
D. L. Hattenbrun, Quality Engineer (Level III)
R. G. Walter, Project Engineer

Pullman-Higgins (Pullman)

R. G. Davis, Field QA Manager
D. B. Hunt, QA Records Supervisor

USNRC

D. Terao, NRR Mechanical Engineering Branch (telephonic contact)

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 inspector interviewed craft personnel, supervision, and quality inspection personnel as such personnel were available in the work areas.

Specifically an inspector checked the housekeeping and general storage conditions for snubbers located, but not yet installed, within Unit 1 containment. Receipt inspection tagging, pre-installation ID, and protection of the snubbers were discussed with QA personnel and evaluated with regard to criteria delineated in UE&C Specification 248-8 (Revision 4). The document package for one Grinnell Type B snubber (ESB-919) was spot-checked for completeness and consistency.

An inspector also examined the Unit 1 pressurizer surge line for location of temperature element nozzle (TE450) in line with drawing requirements. Installation of the Unit 1 Containment Air Handling Units was noted and checked against the applicable QA requirements of UE&C Specification 522-1 (Revision 6). Ultrasonic Testing of an accumulator safety injection line weld (SI 204-01) for confirmation of centerline shrink indications was witnessed and discussed with the Level II technicians.

A visiting IE PWR instructor reviewed the licensed operator training program and evaluated simulator usage, training material, and records with regard to the schedule and overall preparations for NRC licensing examinations and safe plant operation.

No violations were identified during any of the plant tours or in any independent inspection areas.

3. Licensee Action on Previously Identified Items

- a. (Closed) Unresolved item (443/82-02-03): Code boundary question for dual function pipe whip restraints. Amendment 45 to FSAR paragraph 3.6(B).2.3b has clarified the design use of certain pipe whip restraint steel as intervening elements for the attachment of ASME seismic restraints. Contact with a responsible engineer in the NRC office of NRR has revealed that this position is acceptable as long as the installation meets design requirements. The inspector confirmed this, particularly with regard to weld upgrade in line with code standards.

A further question with regard to ASME Section XI applicability for ISI of the subject pipe whip restraint welds is to be addressed by

NRR on a generic, rather than site specific, basis. This item is closed at Seabrook.

- b. (Closed) Unresolved item (443 and 444/82-03-01): Conflicting requirements for cable tray hardware acceptance. A UE&C letter (June 15, 1982) identifies the types of bolts acceptable for cable tray usage, based upon bolt head marking ID. It also clarifies the requirement that certificates of compliance, rather than material test reports (MTRs), accompany the bolt shipments to the site. While mil certification criteria are still imposed, the actual MTRs will be retained by the supplier and are available for audit or upon request.

This position resolves any conflicting requirements for bolt receipt inspection and acceptance. Acceptable bolts may be uniquely identified by their bolt head markings. This item is closed.

4. AWS Welding (Units 1 and 2)

Based upon field inspections of structural welding accomplished in accordance with commitments to AWS D1.1 Structural Welding Code, certain questions arose with regard to both code interpretation and intent. Several disciplines and contractors were involved as indicated by the following specific welding items inspected:

- instrument channel welding - single bevel groove welds
- structural and pipe whip restraint welding - single and multipass fillet welds
- RCPB loop piping whip restraints - limited access fillet welds

The inspector selectively examined Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR) and evaluated the licensee FSAR position on USNRC Regulatory Guide (RG) 1.71 Welder Qualification for Areas of Limited Accessibility. The inspector discussed the NRC concerns with licensee and construction manager welding engineers and reviewed the record of further UE&C research and a meeting held with contractor welding and QA personnel.

While no violations were identified, certain issues were clarified and actions taken to resolve the generic AWS welding concerns:

- (1) Concern - conformance to table 2.7, AWS D1.1, on minimum fillet weld size for prequalified joints.
Resolution - individual passes for multi pass welds shall represent the same heat input per inch of weld length as required by table 2.7 or separate qualification is necessary. Proper preheat shall be applied to fillet weld repair build-up.
- (2) Concern - incorrect application of AWS D1.1 workmanship tolerances allow actual joint configurations to violate WPS essential variables.

Resolution - the actual qualified weld joint shall be illustrated on the WPS. Confirmation of the UE&C interpretation of AWS D1.1 is being solicited by letter to the American Welding Society. Additionally technique sheets will be developed for unique welding grooves. Workmanship test samples for such unique welds are also required.

- (3) Concern - reliance upon final acceptance of AWS limited access welds (ie: visually examined only) vs. implementation of special qualifying techniques.

Resolution - contractor procedures shall address limited access weld identification, evaluation, and special welding and examination techniques.

The construction manager has provided direction to the contractors on each of the above issues and in at least one case, the licensee QA stop work authority was exercised to implement the necessary controls. The inspector has no further questions or concerns on the corrective actions taken with regard to the above AWS welding items.

5. Containment Structural Steel Erection (Unit 1)

The inspector reviewed the overall program for field control of the addition of a significant amount of supplemental structural steel to the Unit 1 containment annulus area, for utilization as relocated electrical cable tray support members. General engineering guidelines and design modifications, as specified in UE&C Engineering Change Authorization (ECA) 08/1656B and attached drawings, were examined and compared to actual field erection.

The inspector verified that the erection contractor's detail drawings had been approved by UE&C and he spot-checked certain AISC Steel Construction Manual code items such as slotted hole considerations, high-strength bolted connections, and minimum fillet weld sizes. With regard to hanger connections to existing steel, the inspector questioned specific orientation and centerline details which apparently could not be achieved in the actual field erection. Discussions with site engineers revealed that such conditions would be annotated on the required as-built drawings and reviewed for engineering adequacy. The inspector confirmed that the UE&C planned beam verification program in conjunction with the as-built document requirements (Administrative Procedure - AP39) would support such a review. He has no further questions on this item at this time.

No violations were identified.

6. Pipe Installation (Unit 1)

a. Piping Run

The inspector examined the installed ECCS injection lines from their

containment penetrations to their cold nozzle entry into the Reactor Coolant loop piping. He specifically walked the RH-158 line, checking valve location, check valve flow direction, connection of the accumulator discharge and intermediate-head safety injection lines to the RHR piping, and tie in to the other RC loops considering redundancy and hot leg entry design criteria. Valve location and position and general pipe support layout in other ECCS lines were also spot-checked. One in-process weld (SI 203-04, F0404) was examined and documentation and QC controls verified.

The inspector evaluated installed conditions with regard FSAR commitments (sections 3.9 and 6.3) and UE&C drawing requirements (eg: F804979). No violations were identified.

b. Pipe Supports

The inspector spot-checked the in-place condition, either final accepted or still in progress, of the following pipe supports and whip restraints and compared them with their design drawings:

- 1304-SG-28
- 713-RG-01
- 839-SG-04
- 703-RG-01
- PW-13-3 and PW-49-3A

Welding items were evaluated with regard to criteria in the governing ASME III, NF or AWS codes. Support member sizes were randomly checked and field changes were confirmed from an engineering standpoint by review the applicable ECAs. The inspector specifically examined support/restraint relation with and connection to structural and supplementary steel members and embedments.

No violations were identified.

7. Reactor Pressure Vessel (RPV) Internals (Unit 1)

The inspector toured the temporary storage building, housing the RPV lower and upper internals, RPV head, and some reactor coolant pump internals and motors. Overall Level B storage conditions, to include temperature and humidity control, were verified. Access control was observed. The inspector examined current, component surveillance tags and discussed the required maintenance activities with the Long Term Storage Supervisor.

The storage position and condition of the lower and upper internals were specifically checked against the requirements of the Westinghouse NSD Receiving and Storage Manual - Volume I for Mechanical Equipment. While no violations were identified, the inspector noted the surface condition of some stainless steel welds for the antirotation brackets on the lower internals. It was determined that these welds in an as-welded condition

had received water-washable, liquid penetrant testing (LPT) by Westinghouse and the inspector questioned whether meaningful LPT results could be attained on the observed surface.

The licensee has agreed to conduct additional LPT on the worst case surface conditions, using water-washable techniques, and accomplishing surface grinding, if necessary, to obtain a meaningful NDE evaluation. Pending the conduct of this additional LPT with witness by the NRC Resident Inspector, this item is unresolved (443/82-08-01).

8. Design/Construction Interfaces (Units 1 and 2)

a. The inspector raised certain questions in the design control area regarding verification, field changes, and construction activities having potential impact upon the design basis of pipe and component supports and whip restraints. Specifically the following issues were discussed:

- (1) Location of pipe whip restraint connections to concrete embedments (Ref: ECA 73/3209B):
Per UE&C As-Built Procedure (AP-39), the whip restraint installer must submit as-built drawings of the restraint/embed relationship for further engineering review. Even embed plate location deviations, normally a different contractor's responsibility, shall be identified by the restraint erector's as-built drawing program.
- (2) Use of modular anchor plates (MAP) by construction and potential for unacceptable placement of welds near interfaces:
MAPs are concrete embedment anchor plates (Ref: F10169B) which consist of individual embed plates attached together for ease of construction and post erection availability. The interfacing surfaces of the individual embeds may be tack welded, but are not considered to be structurally joined. Contractors attaching to embeds are required to maintain a minimum edge distance of 1½" for welds parallel to embed edge, so that attached member loadings stay within the stud spacing on the back of the embed plate.

The inspector raised the question whether this 1½" minimum edge rule was being followed with regard to the interfacing embed surfaces of erected MAPs. No guidelines had been disseminated on this potential problem and UE&C engineering personnel are currently evaluating both the safety impact and applicability to the regulatory requirements of 10 CFR 50.55(e). This item remains unresolved pending final analysis by the A/E and coordination with the licensee for acceptable guidelines in this area (443/82-08-02).
- (3) Support designer and verifier identification on UE&C pipe support drawings:

UE&C QA Procedure QA-3 (Revisor 10) for Design Control at Seabrook requires that both the designer and checker (ie: design verifier) identify themselves on each project drawing with initials indicating drawing preparation and verification in accordance with the project design criteria and specifications. For UE&C pipe support details there is some question as to whether the identifying initials on each drawing really constitute design and verification functions or merely draftsman and checker actions. The question further relates to whether an individual who only collates individual design data, engineered by others, into a final drawing product can be categorized as the "designer."

Licensee third level QA audit personnel are currently researching these questions and the YAEC Corporate Manager has indicated that corrective action, if appropriate, shall be taken. Pending either justification of the present design/verification ID program or redesignation of the responsible signatories to the pipe support drawings, this item is unresolved (443/82-08-03).

- b. A) inspector reviewed the following design issues with emphasis upon corrective action and proper interfacing between site engineering and both AE home office engineering and site construction personnel and contractors.
- Construction Deficiency Report: pipe support design deficiencies - verification that A/E corrective action has been extended to site engineering organization.
 - UE&C Administrative Procedure (AP15) revision governing "minor" design changes (ref: ECA 01/3547A): implementation of design controls to define "minor" changes and to assure that revised construction work would not proceed without verification past the point where installation would become irreversible without extensive demolition and rework.
 - UE&C Administrative Procedure (AP39) program for as-built records and their utilization to confirm the design adequacy of field conditions, as constructed: application of the beam design verification program to consideration of torsional loadings for off-center beam connections, clarification of cable tray erection details (ECAs 01/3152A and 03/1686A) with regard to this issue, and extension of corrective action to other contractors (eg: instrumentation - ECA 05/0614A).

The inspector verified the interdisciplinary application of the above design programs to affected site contractors and confirmed, through discussions with site engineering personnel, that generic concerns such as component support locational tolerances are now being adequately addressed.

No violations were identified.

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs 7,8a(2), and 8a(3).

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.