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

Region I

Report No. 50-423/79-05

Docket No. 50-423

License No. CPPR-113 Priority: -- Category: A

Licensee: Northeast Nuclear Energy Company
P.O. Box 270
Hartford, Connecticut 06101

Facility Name: Millstone Nuclear Power Station, Unit No. 3

Inspection at: Millstone Unit 3, Waterford, Connecticut

Inspection conducted: June 4-8, 1979

Inspectors: A. D. Toth — July 17, 1979
A. D. Toth, Reactor Inspector — date signed

Approved by: R. W. McGaughy — August 28, 1979
R. W. McGaughy, Chief, — date signed
Projects Section, RC&ES Branch

Inspection Summary:

Unit 3 Inspection on June 4-8, 1979 (Report No. 50-423/79-05)
Areas Inspected: Routine, unannounced inspection by a regional based inspector of Quality Assurance Procedures for reactor coolant piping welding and reactor coolant piping welding materials control. The inspector also performed plant tour-inspections and reviewed licensee action on previous inspection findings. The inspector also performed followup action as necessary to resolve questions which arose during the course of inspection of the above areas. The inspection involved 28 inspector-hours on site by one NRC regional office based inspector.
Results: No items of noncompliance were identified. However, the inspector identified a number of respects in which stainless steel welding procedures did not incorporate PSAR commitments relative to stress corrosion prevention. (Para. 4)

DETAILS

1. Persons Contacted

Northeast Utilities Service Company

*T. W. Deshefy, Resident Civil Engineer
*J. A. O'Brien, Construction Quality Assurance
K. Gray, Construction QA Manager
*S. Orefice, Superintendent - New Site Construction
*J. F. Putnam, Senior Engineer
*S. R. Toth, System Superintendent - Generation Construction

Stone & Webster Engineering Corporation (S&W)

*B. Anderson, Assistant Superintendent - Field QC
*R. Bernard, Senior Superintendent - Field QC
*J. S. Carty, Assistant Project Engineer
*C. Clough, Construction Assistant
*P. A. Gagel, Quality Assurance Program Administrator
*R. H. Lane, Superintendent of Construction
*W. MacKay, Resident Manager
*C. Marrs, Superintendent of Construction
*J. S. Searway, Assistant Project Manager
*F. K. Sullivan, Resident Engineer
*G. G. Turner, Superintendent - Field QC
*J. Whedbee, Assistant Superintendent - Field QC

*Denotes persons present at management interview.

2. Plant Tour

Shortly after arrival on site the inspector visited various parts of the plant to observe work activities in-progress, completed work and plant status. Observations made during this general inspection of the plant were considered as warranted during later inspection of the construction quality assurance program implementation in specific areas. The inspector examined work for any obvious defects or noncompliance with regulatory requirements. Particular note was taken of presence and/or availability of quality control inspectors, and quality control evidence such as inspection records, material identification, nonconforming material status, inspection/process hold-point status, 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 during this general tour-inspection.

3. Licensee Action On Previous NRC Inspection Findings

(Closed) Unresolved Item (423/76-03-01): Records storage and control conformance to ANSI-N45.2.9 (Ref.: IE Inspection Report 50-423/79-02). The NRC has completed its review of the Northeast Utilities QA Program Topical Report, Revision 3A, including Appendix F, which identifies a 2-hour-rating door at NNECO, consistent with the original construction criteria. NRC approved the topical report on March 13, 1979. The inspector had no further question on this matter.

4. Reactor Coolant Loop Piping - Welding Procedure Specifications and Quality Assurance Procedures

The inspector reviewed the current project schedule to ascertain those reactor coolant loop piping activities scheduled within the next 6 months. Installation of ASME Class 1 and 2 stainless steel piping in the radioactive piping rack, in the containment lower annulus, appeared on the schedule. Accordingly, the inspector examined four applicable welding procedure specifications relative to welding of stainless steel piping, involving two weld processes and a combination of the two (GTAW and SMAW), and three joint configurations (socket/fillet, butt/insert, and butt/backing ring). The inspector also examined associated procedure qualification records, and quality control inspector checklists in preparation.

The inspector evaluated the above documents relative to applicable codes, standards, NRC Regulatory Guides, and other related commitments of the Millstone PSAR Sections 3.1, 3.2, 5.4 and Q5.15, and general quality assurance program commitments in the PSAR Section 17, and NRC 10 CFR 50 Appendix B. The inspector considered essential and non-essential variable relationships of the procedures and the associated procedure qualification records, number/type/results of qualification mechanical tests, content of the procedures, approvals and certifications of the procedure qualification records, and special requirements such as controls for stress corrosion cracking.

The inspector also ascertained the availability of applicable S&W procedure EAP-9.1 "Preparation, Review, Approval of Material Process Procedures."

The inspector examined the following records relative to the above:

S&W Engineering Assurance Procedure 9.1 Revision 2

S&W Specifications

M 968	Rev. 1 with Addendum No. 1 dated November 14, 1977
M 928	dated March 8, 1977 (ME 103C, 104C and 105C)
W 100 B	Rev. 21 dated May 3, 1979
M 582	Rev. 3 dated April 6, 1979
M 450	Rev. 2 (Title Page re: code applicability)
M 150	Rev. 2 (Title Page re: code applicability)

S&W Line Designation Table Rev. 19 dated February 1, 1979

S&W ASME QA Manual Section 13 Revision C
Section 10 Revision F

Fabrication/Installation Control Drawing CI-CCP-251

Weld Data Sheet CI-CCP-251-FW-002

Isometric Drawing (SWF) ISO-3-FWA-506

Weld Technique Sheets ---- Procedure Qualification Records

W12B	Rev. 1	PQT-E5-14
W12E	Rev. 1	PQT-C6-01
W12G	Rev. 0	PQT-C6-02
W22F	Rev. 1	PQT-F4-05; PQT-E5-14

a. The inspector found that the welding specifications and technique sheets, and inspection procedures deviated from PSAR Commitments in the following respects: he noted that EAP-9.1 did not reference the PSAR, as a check for omissions such as these:

(1) PSAR part 3.1.3.44 states that the corrosion tests of RG-1.44 part C.6 will not be incorporated into procedure qualifications; in lieu of this, the heat input and other essential variables of the procedure shall be monitored to assure that they are in the proper range to avoid sensitization.

Stone & Webster weld Specification W100B, pipe Specification W968, and technique sheets W12B, W12E, W12G, W22F for austentic stainless steel welding do not require monitoring of heat input, nor does the applicable quality control inspection procedure of the Stone & Webster ASME Section III Manual Part 13. (423/79-05-01)

(2) PSAR part 5.4 invokes NRC Regulatory Guide 1.31 Revision 1, and commits specifically to performance of ferrite measurements on stainless steel production welds. S&W Specification W968 had included such measurements.

Addendum 1 to the specification deleted this requirement, and made reference to Stone & Webster filler metal specifications (e.g., ME-103, 104, and 105). Licensing Document Change Request Form dated February 6, 1979 (no number identified) described a possible adoption of Revision 2, or maybe Revision 3 of Regulatory Guide 1.31. No clear cut decision was apparent from this document.

R. G. 1.31 Revisions 2 and 3 permit elimination of ferrite measurements on production welds, but impose more rigorous controls on the technique of measuring ferrite in filler metal tests. Stone & Webster filler metal specifications, series ME-103, 104, 105 were not revised to incorporate these more rigorous controls. (423/79-05-02)

(3) PSAR Section 3.2.4 and 3.2.5 (1) and Q5.15-1 established the ASME Section III 1971 Edition with Addenda through Summer 1973 as the applicable piping code.

The inspector observed that Stone & Webster weld filler specifications (Series ME of Specification W928) and welding Specification W100B, and piping fabrication/ erection Specification W968 reference the 1971 edition with Addenda through Winter 1973. The inspector observed that isometric drawings provided by Southwest Fabricators reference the Summer 1973 Addendum, consistent with the PSAR.

This matter is unresolved pending licensee identification of ASME code editions and addenda applicable to the various activities of design, fabrication, installation, and testing, and examination of provisions to accurately identify these matters in the FSAR. (423/79-05-03)

(4) RESAR-3 Section 5.2.5 listed Westinghouse procedures which were to be provided "to the architect and to the owner...for use in their scope of supply and activity to assure compliance with the ANSI 45 committee specifications." It provides that Westinghouse will conduct surveillace at the installer's construction site to assure that installers adhere to the rules.

These documents were not available on site, nor apparently, at the Stone & Webster Boston project office. The Stone & Webster field Quality Control group took immediate action to obtain copies, and obtained a copy by teletype of one specific document requested by the inspector (PS-84351 NL).

This item is unresolved pending review of Stone & Webster actions relative to implementation of the Westinghouse procedures. (423/79-05-04)

b. The inspector also noted that the pipe welding specifications, technique sheets and inspection procedures contained the following omissions:

(1) ASME Section III NB-4421 requires that if backing rings are used on Class I pipe welds, they shall be removed after welding and the inside surface of the roots examined by NDE, or special analyses performed per NB 3352. Stone & Webster Specification W968 prohibits permanent backing rings unless approved by the engineer. However, welding Specification W100B includes a procedure W12B as an available procedure for site use; it utilizes backing rings for Class I welds but does not include a requirement for removal of the ring. A separate procedure for backing ring removal, with appropriate NDE requirements is not referenced nor available. Site Quality Control procedures and checklists do not include verification of backing ring removal. This item is unresolved pending establishment of controls consistent with criteria V, IX, X, XVII of Appendix B. (432/79-05-05)

(2) ASME Section III NB-4425 and figure NB-4233-1 require that a 3/1 taper be included where components of different diameter are joined. Stone & Webster Specification W100B part 16.2.1 states that welds "may be tapered" where components of different outside diameters are joined. It is not clear that the mandatory provision of the ASME Code have been incorporated into implementing specifications.

This item is unresolved pending future review of specification implementation. (423/79-05-06)

(3) In addition to the above items, the inspector observed that the piping class designation was incorrectly shown, for three pipe lines (e.g., 3SIL-006-38-2), on the Line Designation Table used by S&W Field Quality Control. This table is a referenced part of Specification M968,

and is used by S&W Field QC to assign inspection requirements commensurate with pipe class. The issue of the table available in the QC office was not current, and the current issue obtained from the on-site engineering group showed the correct line designations for the three lines, consistent with the applicable Fabrication/ Installation Control Drawings. The QC supervisor took immediate action to have the Field QC office placed on distribution for revisions to this document.
This item is unresolved pending future inspection of the document control system for site documents. (423/79-05-07)

5. Reactor Coolant Loop Piping - Welding Material Control

The inspector examined welding material purchase, acceptance, storage and handling associated with stainless steel reactor coolant pressure boundary piping. This included review of procedures, records, material storage and issuing facilities, and work areas. The inspector examined certification reports for four lots (4,334 pounds) of type 308-16 covered flux electrode (3/32", 5/32", 3/16" size).

The inspector evaluated the above items relative to applicable codes, standards, NRC Regulatory Guides, and other related commitments of the Millstone PSAR Sections 3.1, 3.2, 5.4 and Q5.15, and general quality assurance program commitments in the PSAR Section 17, and NRC 10 CFR 50 Appendix B. The inspector considered required material tests, certifications, identification, on-site control, moisture and cleanliness control, damaged electrode control, and handling of returned materials.

The inspector examined the following documents relative to the above:

S&W Specifications:

W100B Rev. 21 dated May 3, 1979
M928 dated March 8, 1977 (M103C, 104C and 105C)

S&W Quality Standards and Quality Assurance Directives Manuals (sections as applicable)

Quality Assurance Inspection Reports

QAIR - WM 3511517M (1975 procurement)
QAIR - W 7051437 (1978 procurement)

ARCOS Corporation Certifications of Test

Lots: No. 5M8A Mix 31
No. 5M2A Mix 29
No. 7F7B Mix 7
No. 7F36B Mix 1

The record review showed that the stainless steel electrode was procured to meet the ASME Section II Edition with Addenda through Winter 1973. No reference was made to special test criteria for NRC Regulatory Guide 1.31 Revisions 2 or 3. (This item is discussed in Paragraph 4 of this report.) The responsible S&W weld engineer stated that stainless steel weld rod had not yet been used on safety related piping, other than a low temperature low pressure line (8-welds) between a containment sump and an auxiliary building.

Since the weld rod procurement system does not differentiate between safety related versus non-safety related applications, this item is unresolved pending clarification of the RG-1-31 matter discussed in Paragraph 4, and review of the disposition of weld material procured to date. (423/79-05-08)

6. 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. Unresolved items disclosed during the inspection are discussed in Paragraphs 4 and 5.

7. Management Interview

At the conclusion of the inspection on June 8, 1979, a meeting was held at the site with representatives of the licensee and contractor organizations. Attendees at this meeting included personnel whose names are indicated by notation (*) in Paragraph 1. The inspector summarized the results of the inspection as described in this report.