U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-423/84-21

Docket No. 50-423

License No. CPPR-113 Priority -- Category B

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

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

Inspection At: Waterford, Connecticut

Inspection Conducted: October 15-19, 1984

Inspectors: Samuel D. Reynolds, Jr. 11/26/84
S. D. Reynolds, Jr., date
Lead Reactor Engineer
M&P Section, EPB

E. H. Gray 11/26/84
E. H. Gray, Lead Reactor Engineer date
M&P Section, EPB

Approved by: J. R. Bellinger for 12/9/84
J. Durr, Chief, M&P Section, EPB date

Inspection Summary: Inspection on October 15-19, 1984 (Report No. 50-423/84-21)

Areas Inspected: Routine, unannounced inspection of licensee activities conducted by one regionally based Reactor Engineering Inspector. Inspection coverage included facility tour, pipe and pipe support welding, copper-nickel welding, repair welding of high strength low alloy supports, and review of previous open items. The inspection involved 36 hours on site by one inspector and 6 hours at regional headquarters by two regionally based inspectors.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Northeast Utilities Service Company (NUSCO)

*K. Gray, Jr., Construction QA, Staff Assistant
D. Blumenthal, QA Engineer
A. Silvia, Engineer
*R. Lefebvre, Project Staff Engineer
*S. Orifice, Project Engineer
E. Boettcher, Engineer Construction Engineering Department
R. Roy, Associate Engineer

Northeast Nuclear Energy Company (NNECO)

J. Crockett, Superintendent, Unit 3
*J. Harris, Startup Supervisor
N. Hulme, Startup Engineer
*D. Miller, Jr., Manager Startup Services

Mettalurgical Consultant

W. Savage, Professor Emeritus Rensselaer Polytechnic Institute

Stone and Webster Engineering Corporation (SWEC)

*J. Capozzoli, Jr., Supervisor of Construction Services
*J. Carty, Superintendent of Engineering
L. Clifford, Startup Engineer
*A. Dasenbrock, Resident Manager
*S. Hunt, EA Program Manager
*G. Marsh, Assistant Superintendent of Construction
W. Rambow, Lead Advisory Engineer
*P. Reilly, Superintendent Site Turnover Engineering Group
*W. Vos, Senior Engineer
A. Mathes, Senior FQC Engineer
G. Collins, Welding Supervisor
D. Dolan, FQC
G. Bendron, Fitter
J. McKinley, Welder
G. Carpenter, Senior Construction Assistant
W. Mageski, Welder
R. Messina, Welding Foreman
L. Tracey, Senior Construction Assistant
H. Shippe, Chief Welding Supervisor
L. Crowley, Construction Assistant
N. Kelly, Welding Supervisor
W. Smith, Welding Supervisor
M. Rowley, Rod Room Attendant
E. Maniz, Rod Room Attendant
C. Schold, Welder

Westinghouse Electric Coproration (W)

C. Peterson, Resident Welding and NDE Engineer
J. Dillon, Resident Project Engineer

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

*Denotes those present at exit interview.

2. Licensee Action on Previous Inspection Findings

(Open) Unresolved Item 82-10-01. The inspector reviewed the licensee's actions on this item which relates to the inspectability of reactor coolant nozzle welds with ENiCrFe-3 weld bands. The licensee is scheduled to demonstrate the ultrasonic (UT) inspectability of the subject joints along with the demonstration for inspectability of the centrifugally cast coolant pipe in November-December 1984.

(Open) Bulletin (IEB 79-13). The ISI frequency for augmented inspection for potential feedwater inlet nozzle thermally induced fatigue cracking will be included on the 10 year ISI plan which is not to be completed until January 1986.

(Closed) Unresolved item 83-21-02. This item relates to interpretation of the P1 to P8 penetration spigot joint (NE 3358.3-1 sketch "d") welded with F43 filler metal. Radiographic examination is inappropriate for this joint. The minimum wall thickness for this joint is 0.160 whereas the actual joint is 0.65". UT inspection would be difficult to interpret. ASME Interpretation III-82-63 indicates the penetrant examination of the root and final weld conducted on this joint is appropriate. The inspector reviewed this data and considers the item closed.

(Closed) Unresolved item 82-08-05 and significant deficiency 82-00-01. This item concerns the repair welding of ASTM: A487 Grade 10Q supports with carbon contents exceeding 0.23% carbon. The inspector reviewed the licensee's metallurgical evaluation of as welded toughness of the subject material with material having hardenability exceeding that of the castings repaired. This information indicates that the as welded heat affected zone (HAZ) exceeds the engineering requirements for the base metal. The licensee requested and received an ASME code case (N407) for these specific castings. The inspector reviewed the repair weld maps, the S&W vendor inspection findings and reports, and the licensee's responses to the questions raised in Inspection Report 50-423/82-10. The inspector also discussed in detail the metallurgical findings with Dr. Warren Savage, Professor Emeritus of R.P.I., and concurs with his engineering conclusions. The inspector reviewed and commented on the LAMCC, Inc. welding procedure specification (WPS) and procedure qualification report (PQR) and compared these documents with the licensee's metallurgical studies. The licensee's fracture mechanics evaluation was reviewed by a Region I materials specialist and was determined to be conservative and acceptable. The inspector has no additional questions. This item is closed.

(Closed) Significant deficiency 84-00-03. This item concerned unacceptable welding of copper-nickel service water (SW) pipe trunions. The inspector reviewed the licensee's actions which included removal, redesign and new fabrication of trunions. The inspector visually inspected the various configurations of the new trunion welds and visually inspected the defective weldments removed from the SW system. The applicable N&D's and E and DCR's were reviewed. The new design and fabrication is acceptable. This item is closed.

(Closed) Unresolved item (82-11-03). This item concerns the use of ASME Code Case 339. This code case is acceptable to the NRC as stated in Regulatory Guide 1.84, Revision 22 (dated 7/84) in paragraph C.1.b.(2). This item is closed.

(Closed) Inspector Follow Item (82-03-01). This item concerns the fact that material certifications for hangers fabricated by ITT/Grinnell are not in the licensee's documentation system, but are held by the vendor. This is permissible for this ASME fabrication. The inspector selected hanger 3-SWP-2-PSA-037 and requested that the licensee demonstrate that the material certifications were retrievable from the vendor, and this was adequately demonstrated. This item is considered closed.

(Closed) Unresolved Item (83-21-03). This item concerns repair of a dent in copper-nickel pipe. The inspector reviewed the acceptability of N&D 3668 and reviewed similar N&D's raised by non-conformances. The technical issues were adequately addressed. This item is considered closed.

(Closed) Significant deficiency (83-00-13). This item concerned the adequacy of self tapping screws for seismic qualification of fan coolers. The screws were replaced with bolts which were acceptable for seismic loading. An after-the-fact seismic qualification was also successfully conducted. The inspector reviewed the licensee's actions and found them to be acceptable. This item is closed.

(Closed) Significant deficiency (83-00-12). this item concerned the use of plug welds in place of fillet welds for mounting connections of Brown-Boveri, 480 Volt load centers. This item was adequately addressed in 50-423/84-09. The inspector reviewed the licensee's actions to preclude the recurrence of improper seismic qualifications of items similar to 83-00-12 and 83-00-13 by 100% review of vendor's seismic qualification reports. This item is considered closed.

(Closed) Unresolved Item (83-01-02). This item concerned the qualification of a tri-metal P3-A8-F43 technique for bead temper repair of steam generator nozzles which had defects associated with field welding over the F43 weld deposit. The inspector reviewed the WPS and PQR documents developed for this repair and found they meet the appropriate ASME code requirements. This item is considered closed.

(Closed) Unresolved Item 83-01-01. This item concerns the review of weldments with similar "Inconel Bands" on nozzle attachments to that discussed in open item 82-10-01. The inspector reviewed the licensee's actions in reviewing similar items and their conclusion that the 82-10-01 item this was a single occurence event. The inspector had no further questions and considers this item closed.

3. Observation of Welding Activities

The inspector observed welding activities starting at the Rod Issue Rooms where the filler metal central system was checked for conformance to code and standards requirements and S&W QA requirements. Specific welds in process were identified through current filler metal issue slips. Limited safety related welds were being performed.

The following welds were inspected as partially completed welds:

1. Structural fillet weld from hanger to cross beam. Welding was conducted in accordance with WPS B31.1, Technique Sheet W31.1-01, Rev. 2, and the welder was qualified to test assembly PQM 005LM, carbon steel plate welded with E7018. Welding was required by changes in the design of the support in accordance with E&DCR FJ36519.

2. Replacement dutchman pipe section on 8" diameter x 0.322" wall, carbon steel pipe on CI-CCP 27A, FW031 required by CRN CJ-CCP-27A-010 with all welding conducted by the gas tungsten arc welding (GTAW) process to WPS W3-02 Rev. 1. Welder was qualified to PQM 178.

3. Field welds FW17 and FW18 on 4" diameter x 0.531 wall, stainless steel pipe on 3-S1H-004-48-2 (ISO CI 514C03). Welds required by hanger replacement.

4. Hanger welds 3-RCS-1-DPSR 1146 and 3-S1H-1-VPSR 1144.

The welding and quality requirements met specification.

No violations were identified.

4. Welder Qualification

The inspector reviewed the qualification records of those welders observed conducting welding operations during the course of inspection. It was noted that welders producing structural fillet welds on pipe supports that were listed as B31.1 were qualified in accordance with SCIX. In one particular case the welder was qualified to PQM 005LM which is a limited access, 6G pipe test assembly. Although this clearly demonstrates the welders skill and ability to deposit sound welds, the specific weld in question is a "Supplementary" steel weld under B31.1 which invokes AISC for design purposes and ultimately D1.1 for welding and welder qualification. The inspector met with cognizant licensee and S&W Engineering and welding representatives and requested clarification of the acceptability of SCIX performance qualification for B31.1/AISC/D1.1 welding. S&W stated

that it was their engineering position (representing the "Engineer" in D1.1) that SCIX qualification was acceptable for structural B31.1 pipe support weldments. E&DCR P-J-7181 processed during the course of the inspection officially clarified the position.

No violations were identified.

5. Conformance to D1.1 Welding Requirements

The inspector raised questions concerning the welding of structures that were neither bridges or buildings, but which utilized AISC design assumptions and, therefore, referenced (through AISC) the requirements to follow D1.1 welding code rules. The licensee indicated that the question of verbatim conformance to D1.1 had previously been discussed in the W R Counsil (NNECO) to Youngblood (NRC-NRR) letter, dated 6/14/84, B11225 which indicates in Table Q210.36-4 the description of D1.1 attributes and licensee compliance commitments. The Table covers 25 attributes. The inspector pointed out that, although the Table covered most of the attributes under question where verbatim compliance to D1.1 was not being achieved, the document did not indicate engineering justification for many of the cases where B31.1/ASME SCIX practices superceded D1.1 compliance.

The inspector reviewed the licensee's program where they substituted their own (licensee/S&W) visual weld acceptance criteria for the verbatim D1.1 acceptance criteria for "AWS D1.1 and ANSI B31.1 support welds". The following E&DCR's were written to modify and/or clarify weld acceptance criteria for pipe supports, conduit supports, instrumentation and HVAC supports.

P-M 6961
P-M 6962
P-M 6960
P-M 7000
P-M 7001
P-M 6999

The licensee conducted training programs to clarify these acceptance criteria to appropriate quality and engineering personnel. Special drawings were made to further demonstrate the new written acceptance criteria.

The inspector reviewed the licensee/S&W position on the effective throat of flare bevel joints for structural supports. The S&W position is to assume for engineering design purposes an effective throat of t-1/16" where "t" is the thickness of the thinner member. This is a modification of the D1.1 Table 2.3.1.4 which calls for 5/16 R (where R nominally equals 2t). The inspector reviewed qualifications conducted by S&W indicating that actual throats of "t" were produced on tubular flare level groove joints in 4 positions with 0" root gap on 1/4", 3/8" and 1/2" tubulars.

The use of the E&DCR system to modify or clarify D1.1 welding code verbatim requirements meets the intent of D1.1 commentary paragraph 1.1 (Application) as these documents are processed, reviewed and approved through the site QA program and recieve official approval by engineering, materials, quality representatives and final licensee approval.

The inspector indicated to the licensee that the question of waiver of verbatim compliance to D1.1 was not acceptable until all items were addressed and answered by engineering justifications. This question is considered unresolved pending further review and acceptance of engineering justifications for all items where verbatim conformance to D1.1 is considered to be "not applicable or suitable to the particular structure" in the engineering design. (423/84-21-01).

No violations were identified.

6. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. An unresolved item disclosed during the inspection is discussed in paragraph 5.

7. Exit Interview

The NRC inspector met with the licensee's representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 19, 1984. The inspector summarized the findings of the inspection. The licensee acknowledged the inspectors comments. No written material was given to the licensee during the inspection.