

U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 82-09

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 Energy Station, Unit 3

Inspection At: Waterford, Connecticut

Inspection Conducted: July 12-16, 1982

Inspectors: A. A. Varela  
A. A. Varela, Reactor Inspector

August 19, 1982  
date

Approved by: J. P. Durr  
J. P. Durr, Chief, Materials and Processes  
Section

8/20/82  
date

Inspection Summary:

Inspection on July 12-16, 1982 (Report No. 50-423/82-09)

Areas Inspected: Routine, unannounced inspection by a regional based inspector of licensee action on previous inspection findings, concrete placement activities for the Circulating Water Discharge Tunnel and, inspection of concrete embedments on a Containment Crane Wall Column. The inspector also performed a plant inspection tour. The inspection involved 32 inspector-hours onsite by one regional based inspector.

Results: Of the four areas inspected, one item of noncompliance was identified: Failure to document a field change and obtain approval for waterstop location in Discharge Tunnel horizontal construction joint.

## DETAILS

### 1. Persons Contacted

#### Northeast Utilities Service Company (NUSCO)

F. W. Comstock Jr., Senior Engineer Construction Quality Assurance  
D. G. Diedrick, Manager - Quality Assurance  
K. W. Gray Jr., Supervisor - Construction Quality Assurance  
D. L. Haisington, Resident Engineer - New Site Construction  
J. F. Putnam, Senior Engineer - New Site Construction  
R. P. Vaccaro, Quality Assurance Inspector - Construction QA

#### Stone & Webster (S&W)

F. Bearham, Program Administrator - Quality Assurance  
R. Bernard, Assistant Manager - Boston  
J. S. Carty, Superintendent - Engineering  
E. B. Fleming, Engineer - QA Cost/Audit Division  
R. D. Flodstrom, Asst. Superintendent - Field Quality Control  
J. G. Kappas, Superintendent - Construction  
J. F. Lannon, Engineer - Field Quality Control  
P. Nelson, Engineer - Engineering Assurance  
G. I. Palmer, Supervisor Project Support - Engineering Assurance  
G. G. Turner, Superintendent - Field Quality Control  
C. E. Watters, Assistant Division Chief - Engineering Assurance

#### NRC

A. E. Hulse, Intern  
J. C. Mattia, Senior Resident Inspector

All the above attended an exit interview on July 16, 1982.

### 2. Construction Site Inspection-Tour

The inspector observed work activities in-progress, completed work and construction status in several areas during general inspection of the site. The inspector 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 hold tags, housekeeping and equipment preservation. The inspector interviewed craft personnel, supervision, and quality inspection personnel as they were available in the work areas. Specific activities observed were the following:

- containment building exterior, erection of steel framed structure of the enclosure building

- containment interior, erection of support platforms for steam generators
- containment interior, construction of suspended truss between crane wall columns and, liquid penetrant verification test of coolant pump clevis pins prior to their installation
- erection of hydrogen recombiner building concrete roof slab
- circulating water discharge tunnel, concrete construction of remaining section
- rock mapping by geologist of recent faults discovered in excavations for the discharge tunnel

No violations were identified.

### 3. License Action on Previous Inspection Findings

(Closed) Violation (423/81-02-06): E&DCRs not distributed/ available for construction. The inspector reviewed Stone and Webster (S&W) Instruction/ Report NEAM-38 Rev. 6 of September 22, 1982, Authorization of Engineering and Design Changes. He observed that the addition of Section 13 to the instruction appears to be an adequate procedure for writing and controlling E&DCRs against unissued drawings. This incorporates new E&DCRs on all drawings presently unissued and ensures their availability for construction. Additionally the inspector observed that appropriate corrective action was taken November 19, 1981 by S&W as explained in a letter to NUSCO. It identified all E&DCRs which had been written against unissued S&W documents and scheduled their incorporation into issued documents. It verified their incorporation in cases where work had been completed. The inspector performed a sample review of E&DCRs and referenced drawings to verify complete incorporation.

This item is resolved.

(Open) Violation (423/81-02-07): Substitution of grade 60 for 40 reinforcing steel. The inspector observed in his review of job specification C-279, addendum 5, dated June 15, 1981, that if grade 40 is unavailable in bar sizes N27 to N11, reinforcing steel of 60,000 psi strength conforming to grade 60 of ASTM A 615 may be substituted. In this case a copy of the material receiving report is sent to the Lead Structural Engineer. S&W letter to NUSCO of February 25, 1981 states that a systematic review will be made of the more heavily reinforced concrete members on each drawing in all areas of structures where grade 60 was substituted for grade 40 reinforcement on a one-to-one basis. The inspector observed in his review of discharge tunnel drawings that grade 40 is specified. However substitution of grade 60 for number 8 and 9 reinforcing steel was noted to exist in the tunnel bottom slab but, the Number 10 transverse bottom

of slab steel was not substituted by grade 60. Evidence was not produced during this inspection that the Lead Structural Engineer had included or addressed the discharge tunnel reinforcing steel substitution.

This item remains unresolved.

4. Discharge Tunnel Waterstop in Construction Joints

The inspector observed in his review of pertinent drawings for the circulating water discharge tunnel and his observations of the incomplete as-built structure that water stop at the construction and expansion joints had not been installed in accordance with the engineers' detail drawing number EC-16C. Also, no engineering design change request existed. As a result of the inspector observations and discussions with cognizant personnel, N&D number 1510 was issued on July 14, 1982. Disposition and approval by the project engineer was obtained on July 15, 1982 to "Accept-As-Is". E&DCR #F-S-9735, dated July 15, 1982 formally documented the field change to place the waterstop in the center of the discharge tunnel construction joint instead of the location shown on the drawing. Project engineering approved the July 15, 1982 change for concrete placements previously made and approved continued construction with water stop in the center of the key way. This permitted the concrete placement of the discharge tunnel base mat to be undertaken between previously constructed sections of the discharge tunnel with approved field changes. However, previously completed concrete pours number C-5781; 5786, 5789, 5790 and 5793 were performed in violation of specification C-999.

This is Severity Level V Violation (Supplement II) for noncompliance with Appendix B 10 CFR 50, Criteria V, (423/82-09-01).

5. Circulating Water Discharge Tunnel - Observation of Concrete Activities

a) Placement Preparation

The circulating water discharge tunnel (north) base slab preparations for concrete placement number C-5903 were observed during this inspection. The inspector independently reviewed geologic approval of rock excavation, construction joint preparation, rebar size, grade, spacing and clearance and, formwork for conformance to requirements of drawings EC-16 series, related E&DCRs and Specification C-999. Except as identified in paragraph number 3 on substitution of grade 60 for 40 reinforcing steel and paragraph 4 on field change for location of waterstop in the construction joint concrete the observed placement preparations were acceptable.

b) Concrete Mixing, Delivering, Placing, Curing

The inspector observed concrete placement by pumping for the discharge tunnel, pour #C-5903. He determined that work and inspection activities

are being accomplished according to applicable specifications, codes, standards and procedures in the following areas:

- proper mix specified and delivered
- duration of concrete mixing
- pumping equipment and transmission pipe maintained the concrete properties
- concrete testing met acceptance criteria performed by qualified personnel using calibrated equipment
- temperature control of mix and forms conform to requirements for hot weather concrete
- adequate crew, placement technique and consolidation were observed
- finishing, construction joint preparation, and curing were observed

c) Batch Plant Operation

Batch plant operation and QC inspection were observed and noted for the following:

- certification of plant by NRMCA
- accuracy of weight scales and their calibration
- qualified inspector verified batch weights, moisture compensation and batch tickets for ingredient weights of specified concrete mix #402, (4,000 psi)
- produced batches met requirements at placement for slump, temperature and air, measured at truck discharge and end of pump line
- satisfactory communication, control and coordination between construction, engineering and QC

No violations were identified in b) and c).

6. Concrete Post Placement Inspection Records Lack Identification of Dislocated Embed Anchor Plate

S&W Quality Control procedure for concrete placement number 10.2 in section 5.5.7, Embedments, states that embedments shall be inspected to assure conformance with the requirements of job specification C-999, Placing Concrete and Reinforcing Steel, and engineering drawings. Specification C-999, Placing Concrete and Reinforcing Steel, states that care shall be

taken to determine that all embedded items are firmly and securely fastened in the position indicated on the Engineer's drawings.

While inspecting a concrete crack in crane wall column A-6 on July 14, 1982 the inspector observed two near vertical intersecting cracks existed in back of an steel embed plate located at elevation (-)7'-9". (Crane wall columns above the elevation -23' floor have three embeds supporting circumferential suspended trusses between columns for cable trays and pipe racks. The (-)7'-9" embed is at center, the others are about 6'-0" above and below). A review of concrete records disclosed that column A-6 concrete was placed December 10, 1976. Other records disclosed that truss erection and welding to embeds at Column A6 occurred during March and April 1979. However concrete post placement inspection in accordance with QCP 10.2, identified as Concrete Finish, for column A-6 is dated March 5, 1982. This record contains details of the concrete crack at the embed at elevation (-) 7'-9" and, a reject tag dated March 6, 1982 is attached to the column. Nonconformance and Disposition Report, N&D #0646 has been posted for the concrete crack at EL.(-)7'-9".

Additionally the inspector observed that concrete was cracked in back of the upper steel embedment and, the lowest embed plate was skewed inward about 2" at the bottom. Correction for the skew by modification of structural steel attachments to the embed plate was obtained by approved E & DCR #PS-1947 dated December 7, 1978. Concrete preplacement QAD 10.2 attribute list requires in-process QC inspection to verify that embedments are secured against displacement. However the postplacement inspection attributes for QC inspection are lacking in verification that embedments have maintained their position. Post-placement QC inspection should track with preplacement inspection as identified in QAD-10.2, Section 5.5.7(c). This states that embedments are inspected to see they are secured against displacement during placing of concrete. This is an unresolved item, (423.82-09-02).

Based on the above observations of the condition of concrete in back of crane wall column A-6 there appears to be a need for an engineering evaluation to determine the cause for cracks in the vicinity of the steel embedment anchors at their present stage of loading. Also, the significance of the cracks to the structural integrity of the embedments. This item is unresolved pending the NRC's review of the licensee's evaluation of the cracks (423/82-09-03).

#### 7. 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 is discussed in Paragraph 6.

#### 8. Exit Interview

The inspector met with licensee's representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 16 at the construction site. The inspector summarized the findings of the inspection. The licensee acknowledged the inspectors comments.