

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-423/82-13

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: Waterford, Connecticut

Inspection Conducted: October 18-22, 1982

Inspectors: 
S. Richards, Reactor Inspector

11/15/82
date signed

Approved by: 
L. H. Bettenhausen, Ph.D., Acting
Chief, Plant Systems Section

11/17/82
date signed

Inspection Summary:

Inspection on October 18-22, 1982 (Report No. 50-423/82-13)

Areas Inspected: Routine, unannounced inspection of material receipt inspection of electrical components; cable and cable tray installation; quality control inspection of electrical work; and licensee actions to meet electrical separation criteria.

The inspection involved 37 inspection-hours onsite.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Northeast Utilities Service Company (NUSCO)

- * F. Comstock, Senior QA Engineering Technician
- * J. Fountain, Construction
- * M. Giblon, Mechanical Engineer
- * K. Gray, Construction QA Supervisor
- T. Sullivan, Resident Engineer - New Site Construction
- * S. Toth, Superintendent - New Site Construction
- * R. Vaccaro, Senior QA Engineering Technician

Stone and Webster Engineering Corporation (S&W)

- * F. Carlson, Construction
- J. Carty, Site Engineering Group Manager
- * S. Cormier, Chief Electrical Superintendent
- * E. Fleming, Chief Engineer, QA Auditing
- * J. Kappas, Superintendent of Construction
- B. Lamb, Chief Inspection Supervisor
- A. Little, Senior QC Inspector
- * W. MacKay, Resident Manager
- * E. McMann, Assistant Superintendent of Engineering
- * S. Miller, Principal Electrical Engineer
- * P. Nelson, Engineering Assurance Engineer
- R. Neumann, QC Inspector
- J. Pierce, Cable Pulling Supervisor
- P. Raimondi, Site Engineering Group
- K. Ryan, Construction
- * R. Scannel, QC Program Administrator (Boston)
- * R. Singh, Senior Engineer, Field QC
- * F. Sullivan, Assistant Superintendent of Construction
- * G. Turner, Superintendent, Field QC
- * W. Vos, Senior Field QC Engineer

Institute for Nuclear Power Operations (INPO)

- * R. Witt, Observer

USNRC

- * J. Mattia, Senior Resident Inspector

* denotes attendees at exit meeting on October 22, 1982.

2. Class IE Equipment and Circuits Separation Criteria

The inspector reviewed applicable portions of the Millstone Unit 3 Interim Final Safety Analysis Report (FSAR) to determine the separation criteria for electrical equipment to which the plant is to be built. The interim FSAR and discussions with licensee and contractor personnel indicated that Millstone Unit 3 will be committed to the Institute of Electrical and Electric Engineers (IEEE) Standard 384-1974 and Regulatory Guide 1.75, which endorses the IEEE standard. The inspector questioned licensee personnel regarding the means by which the separation requirements will be met. Licensee personnel responded that the method of identifying areas where barriers will be required to meet the IEEE standard and the quality control participation in this effort, has not yet been formalized. The licensee is presently defining, in detail, the separation requirements within one document. This item is unresolved pending NRC review of the licensee's detailed separation criteria and the licensee's method for ensuring that separation criteria is met (423/82-13-01).

3. Electrical Equipment Receipt Inspection

The inspector reviewed electrical specifications and quality assurance directives associated with receipt inspection to ascertain whether appropriate and adequate procedures had been established in accordance with the licensee's QA manual and regulatory requirements. The inspector reviewed Receiving Inspection Reports for various components of the Emergency Diesel Generator System, a class IE 4160 volt switchgear and associated components and breakers, several class IE 480 volt load centers, and 5,000 volt power cable. The inspector also discussed receipt inspection with the responsible contractor personnel. No violations were identified.

4. Cable Tray Installation

The inspector reviewed applicable electrical specifications and quality control documents to ascertain whether appropriate instructions had been formulated for the installation and inspection of electrical cable trays and cable tray supports. The inspector compared completed safety-related cable tray installations to the construction drawings for work completed in the intake structure and in manhole tunnels 1A and 1B. No deficiencies between the drawings and the completed work were noted.

The inspector observed that category I cable tray support H112-50, near tray 3TC881P, was in contact with a category I Limitorque Valve Operator Motor. The inspector questioned this installation with respect to interaction during a seismic event. Licensee personnel stated that the installation was incorrect and had probably occurred due to a combination of the installation tolerances allowed for the components. The inspector was unable to identify any other similar installations during tours of plant areas; he deemed this to be an isolated case. The inspector questioned what actions the licensee intends to take to ensure no similar installations exist and to prevent reoccurrence during future construction.

Licensee representatives acknowledged these concerns and stated that corrective action was being formulated. This item is unresolved pending NRC review of licensee action (423/82-13-02).

The inspector noted that Engineering and Design Coordination Report (E&DCR) P-E 2962 changed the hardware used to clamp cable trays to the tray supports from the manufacturer's recommended hardware to a ½ inch square strut washer. The E&DCR did not indicate that his change had been reviewed from a seismic qualification aspect. Licensee personnel indicated that the E&DCR had been processed in the S&W offices in Boston and that the qualification information would be sent to the site from Boston. The information was not available at the conclusion of the inspection. This item is unresolved pending NRC review of the seismic qualification data for E&DCR P-E 2962 (423/82-13-03).

5. Cable Installation

The installation of electrical cable at Millstone Unit 3 was approximately five percent complete with the majority of the installed cable being non-safety related. The inspector reviewed specifications and quality control documents to ascertain whether adequate instructions had been written to govern the installation of cable. Additionally, the inspector observed installed cable and discussed installation procedures with construction, engineering, and quality control personnel. The inspector noted that Specification Number 2400.000-350, section 4, which governs cable pulling, had been replaced by a new section 4 under E&DCR F-E 9581. The revised section 4 requires that maximum allowable pulling tension be observed and references various documents for determining this tension. The specification requires that tension be monitored during cable pulling through ducts and conduit only, because rollers are used for installation in cable trays. The site engineering group indicated that the responsibility to determine the allowable tension was that of the construction personnel. Discussion with construction personnel indicated that construction considered only the maximum allowable tension listed on the cable pull ticket. This tension was based on the manufacturer's recommendation considering the strength of the conductors and did not take into consideration the routing of the cable for installation and the sidewall pressure exerted on the cable during installation in curved raceways. The inspector concluded that the licensee was not considering sidewall pressure during the installation of cable. The inspector noted that the cable pull ticket for cable number 3EJJBPL220, cable code NHT-77, listed the maximum tension as 12,000 lbs., whereas the technical data contained in the cable specification listed the maximum tension as 8,400 lbs. for type NHT-77 cable. The cable specifications were listed as a reference for determining maximum allowable pulling tension in the specification governing cable pulling. When questioned, licensee representatives responded that correspondence from the cable manufacturer allowing the higher maximum tension superceded the cable specification and that the cable specification had not been updated as it was no longer to be used. The correspondence from the cable manufacturer was not available at the conclusion of the inspection.

The inspector also noted that section 4.6.2 of the specification governing cable pulling required a cable pull which had commenced be completed even though the cable may be overtensioned in so doing. The inspector questioned the method by which a determination will be made as to whether the cable is acceptable for use. Licensee representatives stated that they were presently contacting the cable manufacturers to formulate a method and that each cable which is overtensioned during installation is documented by a Nonconformance and Deviation (N&D) report. The inspector noted that at the time of the inspection only six safety-related machine assisted cable pulls had been performed through ducts or conduit, and that all six pulls were completed with a relatively low pulling tension.

As a result of a meeting held between licensee and contractor personnel, the Senior Resident Inspector and the reporting inspector to discuss cable installation concerns, Engineering Hold No. 602 was placed on all machine assisted cable pulls of class IE cable through ducts or conduit. The licensee agreed to issue a Field Construction Procedure which will define how to perform cable pulling calculations. The calculations will be performed for each machine assisted cable pull in ducts or conduit and will be retained by construction. Calculations will be backfitted to the six safety-related machine pulls through ducts already performed. The data needed to perform the calculations will be updated and made available to the field. QC procedures will be revised to reflect changes made to cable pulling procedures. Additionally, the method by which overtensioned cable is determined to be acceptable for use will be reviewed by the NRC during a future inspection. The inspector could not identify a safety concern with regard to the six cables installed. The licensee's effort to upgrade cable installation procedures prior to any further machine cable pulling in ducts or conduit should forestall future problems; pending this effort, this item is unresolved. The licensee's actions will be reviewed by the NRC during a subsequent inspection (423/82-13-04).

The licensee has experienced difficulty when installing category II cable in ductbanks. The ductbanks will also have category I cable installed in the future. When questioned concerning the reason for the difficulty, licensee representatives indicated that the ductbanks may have small angle bends of 45 degrees or less in their routing that are not shown on drawings. This was accepted during construction to allow for interference in the path of the ductbank. Because knowledge of the bends in the routing of cable is required to calculate the pulling tension, the inspector questioned the method by which the licensee will perform calculations for these ductbanks. At the conclusion of the inspection, the licensee was still considering how to allow for this concern. This item is unresolved (423/82-13-05).

6. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable, violations, or deviations. Unresolved items identified during this inspection are discussed in paragraphs 2, 4, and 5.

7. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on October 22, 1982. The inspector summarized the scope and findings of the inspection. The NRC Senior Resident Inspector was present at the meeting.