

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-423/84-09

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: June 4-8, 1984

Inspectors:	<u>G. Napuda</u>	<u>8/20/84</u>
	G. Napuda, Lead Reactor Engineer	date
	<u>F. Paulitz</u>	<u>8/20/84</u>
	F. Paulitz, Reactor Engineer	date
	<u>H. Van Kessel</u>	<u>8/20/84</u>
	H. Van Kessel, Reactor Engineer	date
Approved By:	<u>Anthony T. Gody</u>	<u>8/23/84</u>
	Anthony T. Gody, Chief, Management Programs Section, EPB, DETP	date

Inspection Summary: Inspection on June 4-8, 1984 (Report No. 50-423/84-09)

Areas Inspected: Routine unannounced inspection of the "Turnover" portion of the Quality Assurance Program for pre-operational testing (Including QA/QC overview and interfacing activities; and, licensee action on previously identified items, potentially significant deficiencies and IE Bulletin 82-04). The inspection involved 110 inspector hours by three region based inspectors.

Results: No violations were identified.

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Details

1. Persons Contacted

- *D. Blumenthal, QA Engineer
- *R. Cikatz, QC Engineer
- E. Cosby, Senior Construction Supervisor - Electrical
- J. Festa, Project Staff Engineer
- R. Headrick, Assistant Superintendent of Construction
- W. Lamb, Senior Field QC (FQC) Engineer
- *J. LaWare, Engineering Technician-Construction QA (CQA)
- R. Lefevre, Project Staff Engineer
- *W. Matejek, Project Advisory Engineer
- W. McCarthy, Senior Engineering Technician Control Engineer
- *D. Miller, Jr., Manager of Startup Services
- *K. Murphy, CQA Specialist
- *P. Nelson, Site Engineering Assurance
- *M. O'Rourke, Lead Advisory Engineer - Turnover
- *V. Papadopoli, Supervisor CQA
- *P. Reilly, Superintendent of Construction
- *G. Turner, Superintendent of FQC
- *R. Young, Senior Electrical Engineer
- D. Vail, Engineer - Turnover
- *W. Vos, Senior FQC Engineer
- R. Waylend, Senior Construction Supervisor

The inspectors held discussions and interviews with other administrative, engineering, QA/QC and technical personnel during the course of the inspection.

NRC

*T. Rebelowski, Senior Resident Inspector

*Attended the Exit Interview

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (423/81-11-03): Auditor qualifications. The current and previous issues of Procedure NQA-1.09, Selection, Training, Qualification and Certification of NUSCO and NUPOC Nondestructive Examination Personnel, Revision 2, establish requirements for nondestructive examination personnel other than auditing personnel. The inspector determined that the activity in question was an audit function and the individual performing that function was certified as an auditor in accordance with ANSI N45.2.12. Therefore, certification to ANSI N45.2.6 and Procedure NQA-1.09 were not requirements for the activity being performed.

Based on the above, this item is closed.

(Closed) 83-18-01 (Unresolved Item): General Electric HFA Relay Calibration Type 12 HFA 154B Relay Reset Operated at less than 50% of voltage rating. Vendor procedure GEK-454 states reset coil is designed to operate at a 50-80% of voltage rating for the AC Models, and 50-70% of voltage rating for the DC models. A GE Letter to the licensee dated September 23, 1983 stated "If the reset coil operates the reset latch mechanism below 50% of rating, the relay is considered satisfactory". The licensee has changed procedure GPE-03L, Revision 0, change No. 1, paragraph 5.9.6 for clarification. Reset coils of AC ratings are designed to pickup at 50% or less and DC coils are designed to pickup at 75% or less of rated voltage.

This unresolved item is closed.

(Open) 83-11-01 (Unresolved Item): Main Control Board Termination (Reference 83-00-11 (SD 42) and 83-00-17 (SD 48), paragraph 3). The problem of wire terminations by Reliance Electric are detailed in paragraph 3. Licensee corrective action is to be completed by June 11, 1984.

This item remains open pending review of the seismic test of wire terminations and further inspection. The licensee's final report is expected by November, 1984.

(Open) 83-11-02 (Unresolved Item): System Control Panels (Reference 84-00-04 SD 53, Paragraph 3) wire terminals have inadequate lug crimping in isolator cabinets, main ventilation air conditioning, auxiliary shutdown and other miscellaneous panels. Details are discussed in paragraph 3. Licensee repairs are to be completed by June 11, 1984.

This item remains open for further inspection.

3. Licensee Action on Potential Significant Deficiencies (SD)

(Closed) 83-00-12, SD 43: 480V Load Center Mounting. There is a discrepancy between the weld type specified on vendor drawings and instructions and the weld type utilized in the seismic qualification reports for attachment of 480V load centers to sills. (Reference letters NUSCO to NRC, B10939, November 8, 1983; NUSCO to NRC, F0430A, March 14, 1984; and S&W to NUSCO, NES-34954, March 22, 1984). The equipment affected are Class 1E 480V Load Centers 3EJS* US-1A, 1B, 2A, 2B, 3A, 3B, 4A and 4B. Also affected are the non-class 1E load centers, 3NJS-US-5A and 5B. The load centers are attached to sills by fillet welds instead of plugwelds in order to agree with the seismic qualification report. The inspector examined the fillet welds on both the breaker sections and transforming section of load center 3EJS*US-4A and found them in agreement with the specified corrective action.

This SD is closed.

(Open) 82-00-12, SD 30: Cable Tray Offset Reducers. Crack formations occurred where side rails were notched to allow bending inward. As a result, structural integrity could be challenged during a seismic event. (Reference letters S&W to NUSCO NES-34900, March 16, 1984; NUSCO to NRC, B10644, December 30, 1982; S&W to NUSCO, NES-30249, December 22, 1982; and N&D No. 3380). Final calculations concluded that the Category I cable tray reducers are structurally adequate to perform their function during a seismic event and no corrective action is necessary. The licensee will send a letter to the NRC verifying that this is not a problem.

This SD is open pending review of the licensee's letter.

(Open) 84-00-01, SD 50: Phase to Phase Electrical Fault Motor Control Center (MCC). An electrical fault occurred between phases of uninsulated cable adapters used to terminate oversize cables to MCC circuit breakers and starters as the result of testing with a clamp-on ammeter. (References NUSCO to NRC, FO493A, March 23, 1984). The licensee has removed all uninsulated cable adapters in the MCC's. Where the cable size is too large to terminate directly, the cable is spliced down to the largest size cable able to fit onto the breaker or starter. This modification was controlled by the following engineering and design coordination reports.

- F-E-29072 March 16, 1984
- F-E-29119 March 2, 1984
- F-E-27098 January 21, 1984
- T-E-00354 February 25, 1984
- T-E-00337 January 19, 1984
- F-E-27433 February 22, 1984

This SD will remain open pending review of the licensee's final report. This report is to address the seismic qualification data from Gould, Inc. with regard to the cable adapters.

(Closed) 84-00-06, SD 55: General Electric AKR-30 and AKR-50 Breakers. The electro-mechanical trip units may have been improperly manufactured for breakers located in DC distribution panel boards. (Reference letters GE to NRC April 21, 1983; NUSCO to NRC, FO432A, April 27, 1984; and GE to S&W May 3, 1984). The vendor received ten AKR-30 breakers from the licensee which were returned to the factory for the trip device problem. The breakers were repaired, adjusted, calibrated and returned to Millstone Unit 3.

This SD is closed.

(Open) 83-00-11, SD 42 and 83-00-17, SD 48: Main Control Board Wire Terminals (Reference letters NUSCO to NRC, B10906, September 29, 1983; NUSCO to NRC, FO450A, March 1, 1983; E&DCR T-C-00473 March 9, 1984; and IE Inspection Report Item 50-423/83-11-01).

SD 42 - Various terminations supplied by Reliance Electric Company had incomplete or incorrectly crimped lugs. Also, lugs sized for 16-14 AWG were used to terminate 20 AWG resistor leads on Cutler-Hammer type E30 switches and Stanswick terminal blocks.

SD 48 - Inadequate termination of #14 AWG wire to AMP PIDG 53983-1-14 HD Lugs in the main control board.

Rejection criteria were established based upon AMP recommendations and samples taken from the main control board which failed the UL-486 tensile pull test. 150,000 lugs were inspected resulting in 6,813 lugs being rejected. Repair work is to be completed June 11, 1984. Final Report of SD-48 expected by November, 1984. The environment qualification report SQP-99X2087-A is to include two configurations to be tested for the seismic portion of IEEE-323 exactly as configured in the panels.

These SDs remain open pending further inspection.

(Open) 84-00-04 SD 53: Wire in isolator cabinets/main ventilation, air conditioning and other miscellaneous panels wire termination. (References NUSCO to NRC, F0500A, March 16, 1984; IE Inspection Report 83-11; and E&DCR F-C-29693 March 17, 1984). Lug crimping of wire terminations in cabinets was found to be inadequate. These problems were similar to those discussed in SDs 83-00-11 and 17. A one hundred percent inspection was made using a rejection criteria defined in E&DCR F-C-29693. Licensee repairs are to be completed June 11, 1984.

This SD remains open pending further review.

(Open) 84-00-02, SD 51: NAMCO EA-180 Limit Switch (LS) splined lever shaft may not expand adequately to secure the operating lever when the expansion plug is tightened. These LS are located on valves supplied by Pacific Valves. (Reference letter NUSCO to NRC, F0471A, March 1, 1984). This problem is not limited to Pacific Valves. The licensee has replaced a large number of NAMCO limit switches on other valves from type EA-170 to type EA-180 as the result of environmental considerations. The licensee has contacted the vendor to determine the scope of impact and identify other possible affected category 1E equipment/circuits. The vendor is proposing a design modification to eliminate the problem. The licensee is to submit updated information about July 2, 1984.

This SD remains open pending further inspection.

(Open) 82-00-06, SD 26: Solid State Protection System (SSPS) Undetectable failure. (Reference letter NUSCO to NRC, B10560, September 10, 1982). The test of the output master and slave relays uses a test pushbutton to place a proving lamp in series with the slave relay. This lamp and reduced voltage applied, during test, prevents the slave relay from functioning while providing a continuity test. Should this pushbutton contact not reclose after test, the in-series lamp resistance would prevent the slave

relay from functioning upon protective demand. The vendor proposed a revision to the test procedure of the SSPS that would ensure the relay test circuits in the SSPS operate properly after the system is returned to its normal operating mode. This work is to be completed after system turnover.

This item remains open pending further review during a subsequent inspection.

(Open) 83-00-04, SD 37: Misoperation of Westinghouse DS-416 Reactor Trip Switchgear (RTS) (Reference NUSCO to NRC B10797 May 20, 1983). A design discrepancy occurred when the shaft groove for the retaining ring design was changed. The new wider retaining ring does not seat properly in the existing grooves of the undervoltage trip attachment which could prevent a reactor trip upon demand. The vendor is to supply the licensee with a modified undervoltage attachment for replacement and a field installation procedure for proper alignment and interface of the attachment with the breaker trip shaft. This work is to be completed after system turnover.

This SD remains open pending further review during a subsequent inspection(s).

(Open) 83-00-10, SD 41: Gould Type HE-4 Breakers "C" pole fails to close when the breaker is manually closed. Fourteen such breakers have been identified by the licensee.

These breakers were supplied to the licensee between November 1, 1981 and February 16, 1982. They will be returned to the vendor for replacement.

This SD remains open pending further review during a subsequent inspection(s).

4. Licensee Action on IE Bulletins

(Closed) IE Bulletin No. 82-04: Deficiencies in primary containment penetration assemblies because of problems with Bunker Ramo Company Electrical Penetrations. In a June 17, 1983 letter to the NRC the licensee stated that Bunker Ramo Electrical Penetrations are not in use nor planned to be placed in service at Millstone Unit 3.

This item is closed.

5. QA Program for Turnover

5.1 References/Requirements

- FSAR Section 14, Initial Test Program
- Stone and Webster (S&W) Project Test Program Directive (PTPD) 5.1, Installation Completion and Turnover to Northeast Nuclear Energy Company (NNECO), Revision 2.

5.2 Program and Implementation Review

The procedures listed in paragraph 5.1 were reviewed. Meetings were held with S&W and licensee representatives to determine the process used for the turnover of plant systems from the construction group (S&W) to the licensee Startup and Testing group (NUSCO/NNECO). The completed turnover package for the Charging Pump Cooling System (No. 3330D) was also reviewed in depth. Additionally, an inspector participated in the final walkdown (prior to turnover) of the Vacuum Priming System, which was non-safety related, to observe first hand the workings of the process.

Deficiencies identified during walkdowns are entered into an Installation Completion Report that is the vehicle for tracking the completion of corrective action. An asterisk (star) is used to identify those deficiencies that must be corrected prior to turnover. The work to correct identified deficiencies can be completed by either S&W Construction or NNECO Construction forces.

5.3 Findings

- 5.3.1 A flow/decision tree diagram was developed and licensee/S&W representatives were requested to review the diagram for accuracy and provide corrections and or additional information. The final version of the diagram will be used by NRC inspectors to improve the efficiency and effectiveness of their efforts.
- 5.3.2 It was noted that an Intermediate Walkdown was being conducted that was in addition to those prescribed by PTPD 5.1. This extra walkdown was the rule rather than an exception. The licensee representatives acknowledged the inspector's statement that the procedure should address this effort.
- 5.3.3 The inspector verified the engineering decisions used to remove asterisks from non-corrected or designated items prior to turnover of the CPCSS were well founded and technically correct.
- 5.3.4 The VPS walkdown adhered to established requirements and the identified deficiencies were added to the ICR. The licensee representatives stated that implementation of PTPD 5.1 for all systems has resulted in reduced pre-startup effort.

- 5.3.5 It was noted that procedures for EMD piping walkdowns had not yet been established. PTPD 5.1 has only a general statement on the impact of discrepancies in piping support that may affect dynamic testing of that system. The licensee representatives stated that a procedure for EMD walkdowns was in the process of development. The issuance and adequacy of that procedure will be reviewed during a subsequent inspection. (423/84-09-01)

No violations were identified.

6. QA/QC Interfaces and Overview Activities

6.1 References/Requirements

- Northeast Utilities Quality Assurance Program Topical Report, Revision 4A
- NUSCO Nuclear Engineering and Operations Procedure (NEO) 2.11, Trend Analysis from Quality Related Documents, Revision 4/84
- S&W Quality Control Instruction FM3-S15.1-040, Deficiency Control at System Turnover and Control of Construction Work Permits, Revision 1/4/84
- Field Quality Control Memorandum 11-1, System Turnover and Release

6.2 Program and Implementation Review

The procedures listed in 6.1 were reviewed, discussions and interviews were held with personnel, various activity logs and reports were reviewed, and the plant was toured to observe QA/QC overview of ongoing activities. The foregoing was to determine the level of overview effort. Staffing, scheduling of overview activities and quality trending were also reviewed. Documents reviewed in depth included Construction Work Permits (CWPs) M3-84-3364, Rework Nuts and Bolts; M3-84-3548, Repair Bolting and Restamp Welds; M3-84-3606, Pull Cable; and M3-84-3715, Complete Relay Wiring. The Trend Analysis Summary, First Quarter, 1984 including Trend Analysis Input Sheets and the quality trending computer program were also reviewed. The review of the CWPs also included discussions with the responsible craft foremen.

6.3 Findings

The onsite NUSCO Construction QA (CQA) group consists of 22 members, ten of which are contracted personnel. This group reports offsite to the corporate QA Manager. The Unit 3 QC group has eight members and reports to onsite station (NUSCO Construction QC group were not reviewed) management.

Work on turnover systems is done either by S&W or station personnel. S&W QA and QC overview work done by S&W and station QC overviews work done by station personnel. CQA audits and performs surveillances of S&W efforts. CQA and S&W QA have monthly meetings attended by their managements.

The largest single effort is QA surveillances by CQA. Checklists have been developed for discipline/functional areas. Four "In Process Verifications" and 337 surveillances have been conducted this year to date. Additionally, 15 to 20 audits a year are conducted. This group also reviews all CWPs and provides management with weekly, monthly, quarterly and annual summaries of QA overview activities.

Station QC inspects only QA Category I work. It is not required to overview work classified as Category II or III. Some type of inspection has been or will be done on each Category I CWP issued this year (180 inspections completed of 250 scheduled). The inspector noted that QC personnel have been on a weekly schedule of five 12 hour days and one 10 hour day for the past month. The group supervisor stated that should the alertness of the group members degrade he would request assistance from the other station QC groups or from QA.

The quality trend analysis being done by CQA appears to be a viable management tool. Since it has been implemented only recently it could not be verified that the analysis is being utilized by management to improve the quality program. The inspector stated that the usefulness of this effort could be enhanced by including a weighting factor to amplify the significance of findings, and the line graph of significance could then be compared to a line graph of total findings so that additional attention could be directed at qualitative (e.g. significant) problems as well as quantitative problems. The inspector also stated that further refinements could be categorization of items by the same group/persons, a dedicated group to handle the trending effort and expansion of the trend analysis to other licensee plants. The licensee representatives acknowledged the inspector's statements.

No violations were identified.

7. Management Meetings

Licensee management was informed of the scope and purpose of the inspection at an entrance interview conducted on June 4, 1984. The findings of the inspection were periodically discussed with licensee representatives during the course of the inspection. An exit interview was conducted on June 8, 1984 at the conclusion of the inspection (see paragraph 1 for attendees) at which time the findings were presented to licensee management.

At no time during this inspection was written material other than the turnover flow/decision tree diagram provided to the licensee by the inspectors.