U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 85-43

Docket No. 50-423

License No. CPPR-113 Category B

Licensee: Northeast Nuclear Energy Company

P. O. Box 270

Hartford, Connecticut 06101

Facility Name: Millstone Nuclear Power Station, Unit 3

Inspection At: Waterford, Connecticut

Inspection Conducted: August 5-9, 1985

Inspectors: W. F. VanKessel 9-24-85
H. F. VanKessel, Reactor Engineer date

Nate Chen 9-26-85
U. Chen, Reactor Engineer date

Approved by: D. Haverkamp for 9/26/85
P. W. Eselgroth, Chief date
Test Programs Section, OB, DRS

Inspection Summary: Inspection on August 5-9, 1985
(Inspection No. 50-423/85-43)

Areas Inspected: Routine unannounced inspection of the preoperational test program, including test procedure review, test witnessing, test results evaluation, emergency diesel generator test status, engineered safeguard test status, Quality Assurance and Quality Control.

Results: No items of non-compliance were identified.

DETAILS

1.0 Persons Contacted

Northeast Nuclear Energy Company (NNECO)

A. Andreae, QC Supervisor
M. Brown, I&C Supervisor
R. Cikatz, QC Supervisor
J. Chunis, Startup Engineer
D. Dickerson, Startup Engineer
E. Fries, Startup Engineer
R. Grebasch, Startup Engineer
N. Hulme, Startup Engineer
J. McConnell, Startup Engineer
D. McDaniel, Startup Engineer
*D. Miller, Jr., Startup Manager
S. Sudigala, Assistant Startup

Northeast Utilities Service Company (NUSCO)

A. Gulesserian, Project Engineer
L. Nadeau, A. P. Engineer
*E. LaWare, QA Engineer
R. Vogel, Project Engineer

Stone and Webster Engineering Corporation (SWEC)

*G. Basilesco, Engineer
W. Matejek, Project Advisory Engineer

U.S. Nuclear Regulatory Commission (USNRC)

*T. Rebelowski, Senior Resident Engineer

* Denotes presence at the exit meeting on August 9, 1985

2. Licensee Actions on Previous Inspection Findings

2.1 (Open) Unresolved Item 423/85-10-01, Vibration Induced Valve Failures

Reference:

Memorandum J. O. Crockett to Distribution, Northeast Utilities, NNEC 3-2617, "Valve Position Indication (VPI) Concerns", dated July 29, 1985.

Status

The status report entitled "Valve Position Indication Problems", a SWEC report is attached to the referenced memorandum issued by the

Unit 3 Superintendent. In this memorandum, the resolution of the remaining problems, as listed in the SWEC report, is tied to the Hot Functional Test as a prerequisite for same.

Although most problem identifications for the various systems have been made, there is much work on Design Deficiency Reports (DDRs), "Unsats", and Engineering and Design Change Requests (E&DCRs) left to be done. The inspector will continue to follow the licensee's corrective actions on this item.

2.2 (Closed) Unresolved Item 423/85-02-02, Fuel Handling problems.

References

(1) Letter from J. J. Dolan of Westinghouse to S. Orifice of Northeast Utilities Service Company (NUSCO), "Millstone Nuclear Power Station Unit No. 3, Fuel Handling Machine W/FDR-NEUM-10266", dated July 22, 1985, with attachment: Field Deficiency Report NEUM-10266, dated July 22, 1985, "Hoist Overload LS Dead End Support".

(2) PMMS Work Order M3 85 22687, Trouble Report 22 M3032956, signed July 23, 1985, problem description: Reset Mechanical Overload; Replace mounting screws per Westinghouse letter WMP-0920 of July 22, 1985.

Discussion

(1) Speed control problems were experienced on the New Fuel Receiving Crane. The speed was considered too fast for up-ending. The resulting start and stop type operations caused the resistor bank to burn out.

(2) The load cell on the New Fuel Handling Crane was lost, resulting in loss of load indication. An in-line load indicator (Dillon) was installed temporarily to continue with the fuel receipt operations.

(3) Two cutouts were experienced on the electrical load cell of the Spent Fuel Pool Bridge and Hoist. There was a loose wire on the clevis pin. This unit is controlled by a microprocessor. The loose wire caused a short circuit in the circuit of the processor causing the digital readout to go to zero. At the same time everything came to a halt. The option of upward motion was lost. The loose wire problem also caused problems with the load settings of the computer load monitor. The mechanical overload setting would drift. The limit switch setting in the hoist has a ± 200 lbs. tolerance which was felt to be too coarse.

Problems (1) and (2) did not appear to be significant from a safety point of view. The problems were fixed and have not re-appeared.

Problem (3), however, had safety significance. At one point in the use of this hoist, the load went down by itself, without command. Westinghouse was approached to resolve this problem. A work order (Ref. 2) was issued to repair the hoist in accordance with the Westinghouse disposition of the problems as contained in reference 1 above. It is considered that all experienced problems have been resolved satisfactorily. This unresolved item (423/85-02-02) is closed.

2.3 (Open) Unresolved Item 423/85-25-01, Fuel Oil Filter Location on EDGs, a Fire Hazard.

A Design Deficiency Report (DDR550) was issued to address the problem. The inspector will continue to follow the corrective actions taken by the Licensee. For further details on this item refer to inspection report 423/85-25.

3.0 Preoperational Test Program

3.1 Test Procedure Review

Scope

The test procedures listed in ATTACHMENT A were reviewed for administrative and, selectively, for technical adequacy and to verify that test planning satisfies regulatory guidance and licensee commitments.

Discussion

The first approved preoperational test procedures (Revision 0), in many instances, continue to be issued late for NRC review. Approved test procedures are to be submitted to the NRC 60 days prior to the start of the test. Although many of those Rev. 0 procedures were reviewed by the NRC in draft form, their review has to be finalized before the test is perform-ed. The inspector concentrated on the review of the approved procedures (Rev. 0) which were issued since the last inspection period (423/85-38).

The procedures were examined for:

- Management review and approval
- Procedure format
- Clarity of stated objectives
- Pre-requisites
- Environmental Conditions

- Acceptance criteria and their sources
- References
- Initial conditions
- Attainment of test objectives
- Test performance documentation and verification
- Degree of detail for test instructions
- Restoration of system to normal after testing
- Identification of test personnel
- Evaluation of test data
- Independent verification of critical steps or parameters
- Quality control and assurance involvement

In accordance with the observations made in inspection report 423/85-25, special attention was paid to the restoration of the system in the procedure.

Findings

No noncompliances were identified by the inspector within the scope of this inspection.

3.2 Test Witnessing

Scope

The inspector witnessed selected steps of the following Engineered Safeguard Features (ESF) and Hot Functional (HFT) related tests:

- "Normal Station Service Transformer 15G-3SA", T3347 BA001, Step 7.11; Energize the transformer.
- "Charging Letdown and Purification Systems", T3304 AP001, Step 7.2.16; Valve Control logic checks.
- "Fuel Building Filter Exhaust Fans and Dampers", T3314 C1M02; Test run of Fan 10B.

Test witnessing by the inspector included observations of:

- Overall crew performance.

- Use of latest revised and approved procedure by test personnel.
- Designation of one person in charge of conducting the tests.
- Availability of sufficient test personnel to perform the tests.
- Coverage of test prerequisites.
- Use of acceptance criteria to evaluate test results.
- Verification that plant supporting systems are in service.
- In-service status of calibrated special test equipment required by the test procedure.
- Adherence to the test requirements of the test procedure during the tests.
- Timely and correct action by test personnel during the performance of the tests.
- Date collection for final analysis by test personnel.

The inspector independently verified readings of system parameters during the tests.

Discussion

The energization of the NSST transformer A, in accordance with Step 7.11 of procedure T3347 BA001, was witnessed by the inspector. No problems were encountered.

The valve logic checks, performed in accordance with procedure T3304 AP001, Steps 7.2.16.1 through 15, ran into a problem. A simulated signal was used to manipulate RWST level in order to actuate the valves 3GWS*PNLDI and 3HVR*R1C12. As required, form PU-590 was used in connection with the simulated signal. The desired valve action was not accomplished because of the failure of a card in the output cabinet. A DDR was generated by the test engineer to correct the problem. The test will be repeated after repairs have been accomplished.

The test run of Fan 10B (3HVR*FN10B) and its automatic shutdown, in accordance with test procedure T3314C1M02, was witnessed by the inspector. It was verified by the inspector that Fan 10B will start locally and can be secured locally. Fan 10A could not be run because train A was shut down electrically. Some problems were experienced with the test run of Fan 10A on account of insufficient

suction vacuum (-6" W.G. to be maintained). After controls were reset for -2.5" W.G. the fan could be run and the test was continued.

Findings

No noncompliances were observed by the inspector.

3.3 Test Result Evaluation

Scope

The test procedures listed in ATTACHMENT B were reviewed to verify that adequate testing was accomplished in order to satisfy regulatory guidance and licensee commitments and to ascertain whether uniform criteria were being applied for evaluating completed preoperational tests in order to assure their technical and administrative adequacy.

Discussion

The NRC review of the test results for the RCS Hydro, performed in accordance with test procedure T3301-P001, is considered to be preliminary because these test results have not yet been reviewed and approved by the Licensee.

The test results were reviewed for:

- Test changes
- Test exceptions
- Test deficiencies
- Acceptance criteria
  - Proper boundaries for the test system.
  - Water quality as required.
  - Minimum test pressure held for 10 minutes. (1.25 x minimum design pressure)
  - Hydrostatic test pressure did not exceed maximum allowable (6% above 1.25 design pressure).
  - Reactor coolant temp. kept above the nil ductility transition temperature for RCS components.

- Performance verification.
- Recording of conduct of test.
- QC inspection records.
- System restoration to normal.
- Independent verification of critical steps or parameters.
- Identification of test personnel.
- Verification that the rest results have been approved.

The last item has not been accomplished yet. Test results of phase 1 tests of the Supplementary Leakage Control and Release System (SLCRS), as listed in ATTACHMENT B, were reviewed for the same general attributes as listed above but for different acceptance criteria.

Findings

No non-compliances were identified by the inspector within the scope of the review.

3.4 Emergency Diesel Generator (EDG)-Testing Status

The 24 hour test runs for both EDGs have been accomplished successfully. The 110% load portion of the acceptance runs, however, has not been done yet. It will be done during the forthcoming ESF tests.

A failure of the engine driven fuel oil pumps on EDG unit A was experienced as a result of dirt introduced into the system during a piping modification. The pump was replaced with a new pump. This pump is a screw type pump. The dirt contained metal filings which seized the pump. The piping modification had been planned for some time but could not be done until recently. The work order for this piping modification was identified as PMMS Nuclear Work Order M3-85-17518. This work order clearly states in a note under the job description/procedures: "Maintain Cleanliness." The work was performed under the guidance of E&DCR T-P-04683.

Findings

It is not clear how the dirt was introduced into the fuel oil system but it is clear that the cleanliness instructions were not

observed. The inspector will follow up on this unresolved Item (85-43-01) in a future inspection.

3.5 ESF Tests Testing Status

The schedule for the integrated ESF tests, 3 INT-2003 and 4, is firming up. It is presently scheduled to start in mid-August. The items, presently on the critical path are the HVAC systems which support the ESF tests. These HVAC systems include the SLCRS (Supplementary Leak Control and Release System) and the Auxiliary Building HVAC (HVR-A). Other critical path items are the Service Water (T3326-P) and the Reactor Plant Component Cooling System (T-330AP). Some test witnessing and procedure review was accomplished for these systems as noted in paragraphs 3.1 and 2 above.

Findings

No non-compliance was identified by the inspector within the scope of this review.

4. QA/QC Interface

Scope

The participation of NNECO-QC in the surveillance program for the preoperational tests was reviewed and evaluated by the inspector. The primary objective of this inspection was to determine how the efforts of NNECO-QC supplemented the efforts of NUSCO-QA.

Discussion

The QC activities conducted by NNECO-QC were discussed with the supervisors of two groups within NNECO-QC. The first unit deals exclusively with the QC requirements for AWOs (work orders) as they relate to the startup program. This group does not get involved with the preoperational tests (POTs). The other group, the Surveillance Group, does get involved with the POTs.

Several NNECO Surveillance reports, as listed in ATTACHMENT C were reviewed by the inspectors for scope of inspection and the nature of the findings. While no hold points are used in the work performed by the Surveillance Group, the first group does use QC hold points. The work done by this group under AWOs are items of repair, adjustment, or design modifications and changes. The desired hold points are identified on the AWO by the responsible NNECO discipline. NNECO has the option to give the work to SWEC if NNECO cannot or does not want to handle the work. In that case the work is done by SWEC under a Construction Work Permit (CWP) and any associated QC work is done by SWEC-Field Quality Control (FQC).

The review of the surveillance reports revealed that NNECO-QC does important surveillances which in their depth of scope, significantly supplement the work of NUSCO-QA.

Findings

No non-compliances were identified by the inspector.

5. Independent Inspection and Measurements

5.1 Controlotron Flow Meter

References

Letter from W. M. Patterson of Controlotron Cor[illegible] to Stone and Webster Engineering Corporation, on interchangeability of the Controlotron equipment on carbon steel and stainless steel piping of the same dimensions (diameter and wall thickness), dated March 20, 1985.

Scope

The Controlotron flow meter is being used both as a permanent and as a temporary instrument to measure flow rates during the preoperational tests. Some problems have been experienced with the use of the flow metering as a temporary installation, during the preoperational tests. The objective of this inspection was to determine if this flow meter could yield reliable and repeatable results for both stainless and carbon steel piping installations.

Discussion

The Controlotron flow meter works on acoustic principles and has digital readout of the flow rate. It uses a sender and receiver which have to be timed to obtain a maximum signal. Transducers and pre-amplifiers have to be matched. The flow measurement is derived from the time differential between the time measured for travel of the signal against the flow direction and the time measured with the flow direction. The important components of the measuring system have to be matched with the given pipe diameter, wall thickness (schedule of pipe), and pipe material. If the installation of the Controlotron uses unmatched components, or is installed improperly, the flow meter will recognize these conditions and will go into a fault mode. The inspector observed this phenomenon on the use of a portable Controlotron in the Auxiliary Feedwater Pump Test as reported in a previous inspection report. The digital readout does not show any numbers when it goes into the fault mode. In this observed case, it was not possible to get a readout above 500 gpm (showed F for Faulted). NNECO I&C felt that the instrument yielded accurate

results (±2%) everytime they had used it or observed it. The instrument, however, is very sensitive to fluid turbulence. They felt that the failure experienced during the AFE Pump test probably was due to excessive water turbulence too close to the instrument.

NNECO I&C had heard about the alleged difference in results between carbon steel and stainless steel piping installations for the Controlotron. The manufacturer (Controlotron) had been approached on this issue. Reference 1 above is their answer to this question. Controlotron feels that the instrument is interchangeable on carbon steel and stainless steel.

Discussions held with one of the startup engineers revealed that he had not been able to get good flow measurements from the Controlotron when used on stainless steel piping.

The inspectors will continue the review of this instrument on a future inspection.

Findings

No violations were identified within the scope of the review.

5.2 Identification of Fuel Oil Filter Parts

Scope

The identification of the components of the fuel oil filters of the Emergency Diesel Generators was pursued. These filters had design deficiencies which were corrected by the manufacturer (Nugent). The Licensee replaced the complete filters including the housings. The objective of the inspection was to verify that the identification of the new filter component was maintained throughout purchasing, storage, and installation.

Discussion

All the paperwork associated with the filter modification was reviewed during inspection 423/85-25. It was found to be in order up to the vendor identification of the modified parts. There were no vendor drawing revisions available in the file to identify the design changes made to the filter internals. In addition there are no changes to the part numbers to differentiate the modified parts from the old parts. The Licensee was asked to contact the vendor to obtain positive identification of the new filter parts. The licensee has agreed to do that. The licensee, also, will destroy the old spare parts. This action by itself, however, does not ensure that the vendor will supply the new modified parts in future spare part shipments.

Findings

Positive identification of the modified filter components has not been achieved to date. The inspector will continue to follow corrective action on this Unresolved Item (423/85-43-02).

6. Exit Interview

At the conclusion of the site inspection on August 9, 1985, an exit meeting was conducted with the licensee's senior site representative's (denoted in Section 1). The findings were identified and previous inspection items were discussed.

At no time during this inspection was written material provided to the licensee by the inspector.

The Licensee confirmed that no proprietary information had been supplied to the inspector by them during this inspection.

ATTACHMENT A
423/85-43
Review of Preoperational Test Procedures

Proc.No.	Title	Rev.	Approval Date
- 3INT-3000 App. 3021	Pipe & Pipe Support Transient Vibration Testing	0	7-18-85
- 3INT-3000 App. 3014	Remote Shutdown with Cool down	0	7/08/85
- 3INT-2001 App. 3TS	Engineered Safeguards System Actuation without Loss of Power	1	7-16-85
- T3349-P001 App. F01	Communications Testing	0	7-11-85
- T3410 BP	Reactor Vessel Level	0	7-25-85
- T3404-P	Digital Radiation Monitor System	0	8-07-85
- T3341AP	Fire Protection (Water)	0	7-22-85
- T3337-P	Radioactive Gaseous Waste System	0	8-02-85
- T3304CP	Boric Acid System	0	7-23-85
- T3311AP	Reactor Plant Sampling	0	8-07-85
- T3313AP	Hydrogen Recombiner/Monitor and Ventilation	0	7-12-85
- T3311CP	Post Accident Sampling System	0	8-02-85
- T3329-1F01	Condensor Air Removal	0	10-20-84
- T3319AP	Condensate System	0	6-15-85
- T3329A	Air Removal Condenser	0	5-15-85
- T3323DA	Gland Seal Steam System	0	2-27-85

ATTACHMENT B
423/85-43
Test Result Evaluation

Proc. No.	Title	Rev.	Approval Date
T3301-P001	RCS Cold Hydro	0	2-21-85
T3314I1I01	SLCRS System Instrumentation	0	2-22-84
T3314I1E01	SLCRS Exhaust Fan	0	12-27-83
T3314I1M03	SLCRS Valves and Dampers	0	10-24-82

ATTACHMENT C
423/85-43
Reviewed Surveillance Reports

Report No.	Title	Approval Date
	NUSCO-QA	
TC3699	Auxiliary Building Phase-1 Startup Test	8-01-85
TC3683	New Fuel Building New Fuel Handling	7-18-85
TC3685	MP-3 Service Water Test	7-22-85
TC3647	Intake Structure/Screen house	6-24-85
TC3650	Turbine Building (TB) EHC System	6-24-85
TC3652	Turbine Building Condensor Air In-Leakage Tests	6-25-85
TC3654	Condensate Polishing	6-25-85
TC3656	Turbine Building Helium Gas Analyzer Erratic Response	6-25-85
TC3657	TB-Waterboxes Cathodic Protection	6-25-85
TC3659	Turbine Building Lube Oil System	6-27-85
TC3660	Screen House	6-27-85
TC3663	TB-Main Feed Pump Turbine	7-03-85
TC3672	TB-RTD Failures	7-11-85
TC3674	TB-Condenser Flanged Bolts Failure	7-12-85
TC-3701	TB-Condenser Sand Blast/Epoxy the Inlet Water Boxes	8-02-85
	NNECO-QC	
585-41	QSS Chem. Addition Tank Drawdown	3-30-85
585-42	Containment Control Room Fuel Pool ESF, Aux. Building	3-30-85
585-40	QSS Chem. Addition Tank Drawdown Phase 2	3-30-85
585-72	Steam Generator ID J Nozzle Replacement	6-18-85

585-52	RCS Fill and Hydrostatic Test T3301-P001	4-27-85
585-53	RCS Fill and Hydrostatic Test T3301-P001	4-30-85
585-92	SIT/ILRT; 3INT2002	7-20-85