U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-423/85-10

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 3

Inspection At: Waterford, Connecticut

Inspection Conducted: March 18-22, 1985

Inspectors: D. Hoek for — 5/21/85
H. F. van Kessel, Reactor Engineer — date

D. Hoek for — 5/21/85
H. Nicholas, Lead Reactor Engineer — date

Approved by: D. Hoek for — 5/21/85
L. H. Bettenhausen, Chief
Operations Branch, DRS — date

Inspection Summary: Inspection on March 18-22, 1985 (Inspection No. 50-423/85-10

Areas Inspected: Routine, unannounced inspection of the preoperational test program including test program requirements and implementation, test procedure reviews, test witnessing; licensee action on previous inspection findings; reactor coolant system hydrostatic test, new fuel receipt and storage; quality assurance and quality control; and tours of the facility. The inspection involved 66 hours on site by two NRC region-based inspectors.

Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

Northeast Nuclear Energy Company (NNECO)

E. V. Fries, Starup Engineer
M. Gentry, Assistant Startup Supervisor
*J. Harris, Startup Supervisor
N. Hulme, Startup Engineer
T. W. Lyons, Startup Engineer
N. Madden, Startup Engineer
*D.B. Miller, Jr., Startup Manager
W. Small, PEO (Operations)
S. Sudigala, Assistant Startup Supervisor
F. Sullivan, Startup Engineer

Northeast Utilities Service Company (NUSCO)

*D. A. Blumenthal, QA Engineer
*R. Lefebvre, NUSCO Senior Project Engineer

Stone and Webster Engineering Corporation (SWEC)

W. M. Matajek, Project Advisory Engineer

U.S. Nuclear Regulatory Commission

*E. McCabe, DRP Section Chief
*T. Rebelowski, Senior Resident Engineer

*Denotes those present at exit interview on March 22, 1985.

2. Licensee Action on Previous Inspection Findings

2.1 (Open) Unresolved Item Valve Position Indication Problems (423/85-02-01)

Progress has been made on this item as detailed in Section 5.

2.2 (Open) Equipment to Piping Flange Alignment violation (423/84/04-13)

A procedure revision is underway to introduce the QC hold point and acceptance criteria for the flange alignment check of all safety related equipment with flange correction to piping. A definitive program will be made to assure that all equipment, which has not been inspected to the new criteria, will be. Upon completion of the procedure, the inspector plans to review same and to follow the implementation of it in the newly defined program. For additional background information refer to inspection report 50-423/85-06.

2.3 (Open) Unresolved Item Seizure Duct Weld Problem (423/83-00-16)

The final item for closure of this item is a determination by the materials laboratory that the assumptions and data used in Stone and Webster's Calculation No. 319 are valid. For additional information on this item see Inspection Report No. 50-423/85-06.

3.0 Preoperational Test Program

References

References for the preoperational test program are documented in Inspection Report No. 50-423/85-03.

3.1 Test Program Requirements

Scope

The nine areas of the preoperational test program requirements that are documented by the licensee are the test program, test organization, test program administration, document control, design changes and modifications, plant maintenance during preoperational testing, equipment protection and cleanliness, test and measurement equipment, and, training and qualifications of startup test personnel. These areas of preoperational test program requirements were discussed with startup personnel, as well as with the startup manager.

Findings

The inspector verified that the startup manager and his staff are knowledgeable of test program requirements; that these nine areas are documented in the startup manual; and that requirements for testing are consistent with NRC requirements and FSAR commitments. The inspector verified that the licensee has a test program and staff that satisfies NRC requirements. The inspector had no further questions in this area.

3.2 Test Program Implementation

Scope

The nine areas of preoperational test program requirements listed in paragraph 3.1 above, are examined periodically by the NRC inspector for implementation during the test program.

Discussion

In the area of the test program, the inspector interviewed the start-up test manager and held discussions with members of his staff, to see that they were familiar with the general description of the test

program and to verify that they were aware of their responsibilities in the conduct of the test program.

The inspector reviewed training records of 4 SWEC startup engineers, 4 NNECO startup engineers, 3 NNECO assistant engineers, and 3 NNECO engineering technicians to verify their qualifications and receipt of required training. This training included administrative controls for testing, QA-QC indoctrination and appropriate technical training.

Findings

Through discussions with selected members of the startup staff, and review of personnel records, the inspector verified that the startup staff have the required qualifications, training, and re-training as necessary and appropriate in order to conduct an adequate test program. The inspector had no further questions in these areas covered. Verification by the inspector of other listed areas of the test program will be conducted on subsequent inspections.

3.3 Test Procedure Reviews and Verifications

Scope

The 10 test procedures listed in ATTACHMENT-A were reviewed for technical and administrative adequacy and to verify that the test procedures satisfy regulatory guidance and licensee commitments.

Discussion

The procedures were examined for: management review and approval; procedure format; clarity of stated test objectives; prerequisites; environmental conditions; acceptance criteria; source of acceptance criteria; 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; and quality control and assurance involvement.

Findings

The review indicated that the procedures are consistent with regulatory requirements, guidance, and with the Licensee's commitments.

No discrepancies or unacceptable conditions were identified. The inspector had no further questions on these procedures.

3.4 Test Witnessing

3.4.1 Accumulator Blowdown Test (Accumulator A)

Scope

The inspector witnessed blowdown of Accumulator A in accordance with preoperational test procedure T3307AP003. The objective of this test is to determine the blowdown characteristic of the "A" Accumulator blowdown system from the vessel to the RCS and to show that specified water injection requirements will be met under the defined accident conditions.

Discussion

The test is done under conditions which are different from the defined accident conditions. It is, therefore, a simulated test. To use the test results to predict performance of the accumulator system under the accident conditions, an analytical model of the system is needed. This model was made by the A/E. The test results are used to determine the dimensionless factors of the "A" accumulator blowdown system characteristic. The blowdown transients for the accident conditions can then be derived (pressure decay in the accumulator tank and the corresponding injection flow rate transient).

Remotely operated valve 3SIL-8808A was opened fully to initiate the blowdown of the accumulator A from the control room. Accumulator pressure was 100 psig immediately prior to valve opening. The inspector witnessed the opening of the valve and the pressure decay in the accumulator as shown on pressure gage 3 SIL-PT960. Another inspector witnessed the same test at the temporary panel in the Reactor building. Recorders on the temporary panel provided pressure and flow transient curves for the test.

Findings

Calibration of all test instrumentation was checked and found to be in order. Valve operation (3SIL-8808A) went smoothly. Valid test data were obtained. It was learned after the test that the specified blowdown requirements were not met. Crew performance during the test was satisfactory.

3.4.2 Charging Pump Flow Balance Test

The inspector observed preparation for the Charging Pump Flow Balance Test in accordance with procedure T3304AP002. The actual test could not be witnessed, however, due to difficulties

experienced in obtaining consistent data from the temporary flow instrumentation. The test was postponed.

The objective of the Charging Pump Flow Balance Test is to determine the weakest centrifugal charging pump and to adjust the injection throttle valves in the injection lines (4) to the RCS to positions which will produce the desired high pressure safety injection water distribution to the reactor with the weakest pump.

Discussion

The following temporary and permanent instrumentation items for the test (T3304AP002) were checked for calibration status and general physical conditions:

- Temporary Pressure Gauges PT-76 and 77, marked, respectively, QA 5202 and QA 5035, Heise gages, calibrated April 13, 1985; local instruments.

- Permanent flow element FE917, calibrated February 6, 1985; DP cell (0-250"), calibrated February 13, 1985; Readout would be taken with a portable voltmeter; local instruments.

- Permanent flow element FE 924, calibrated March 6, 1985; DP cell, calibrated March 6, 1985; Readout by portable voltmeter; local instruments.

- Permanent flow element FE 925, calibrated March 6, 1985; readout by portable voltmeter; DP cell calibrated March 6, 1985; local instruments.

- Permanent flow element 926, calibrated March 6, 1985; readout by portable voltmeters; DP cell calibrated March 6, 1985; local instruments.

- Permanent flow element 927, calibrated March 6, 1985; readout by portable voltmeter; DP cell calibrated March 6, 1985; local instruments.

- Permanent flow indicator FI-17, in control room, calibrated February 6, 1985.

One of the (4) throttle valves in the high pressure inspection lines was examined locally to determine the method used to lock the valve in the desired position. This was valve 3SEHV8 installed in the line to leg No. 3.

It was identified as a Dresser valve.

Findings

All instruments listed above had been calibrated in accordance with the requirements. The inspector noted that all of the permanent local instrumentation was well protected against inadvertent impact from construction activities. The physical condition of the listed instruments appeared to be satisfactory.

The anti rotation (locking) device of the injection throttle valves consists of a locknut on the valve stem which is held in place by a wire which is wrapped around the yoke of the valve and penetrates the locknut on two sides through holes which are drilled obliquely through two adjacent flats of the locknut. This item is of interest in connection with IE Notice 83-70 and its Amendment No. 1 as discussed in Section 4.

4.0 Vibration Induced Valve Failures

Scope

In response to IE Notice 83-70, the Licensee has made a commitment (No. 3596) to address this problem wherever it may appear in the plant. The inspector examined the file on the subject to determine the status of follow up on commitment 3596.

The basic problem highlighted by IE Notice 83-70 (with Amendment No. 1) is the failure of the valve to perform its function upon failure of the anti rotation device (through vibration) which is to keep the valve in a given position. After failure of the anti rotation (valve stem locking) device, the valve position is indeterminate. Valve position indication may not work either depending on the nature of the anti rotation device.

Discussion

The review of the file on the subject, as prepared by the Licensee, indicates that the Licensee has addressed only one make of valve and one type of anti rotation (locking) device as associated with this valve i.e. Limitorque motor operated valves, as identified in NOA6745. Preventive maintenance procedure MP 3783 will be revised to include periodic tightening of the bolts which connect the Limitorque operator to the valve body. The maintenance period will be that of refueling. The scope of IE Notice 83-70, however, is not limited to motor operated valves, but applies also to manual valves. The Dresser valves, mentioned under paragraph 3d, for the high pressure safety injection lines are manual valves which are set after flow balance testing in a fixed position and locked into this position with a locknut which is secured by a wire which connects the locknut to the valve yoke. There also are other types of anti rotation devices to be considered. IE notice 83-70 mentions a collar device held in place by a stud and nut combination. This device was used on gate

valves used by the Walworth Company. At Shoreham Unit 1 there was a problem with an RHR globe valve which uses a stem clamp (with clamp key) and set screw combination. Amendment No. 1 of 83-70 adds more items to this list.

Findings

The licensee agreed to perform the following evaluation as part of their satisfying commitment 3596: The many different anti stem rotation devices (locking devices) will be reviewed for their existence in the plant in safety related applications and, subsequently, after identification, will be reviewed for resistance to vibration induced failure.

Pending the completion of the licensee action, this is considered an Unresolved Item 423/85-10-01.

5. Valve Position Indication Problems

Scope

Five specific valve position indication (VPI) problems have been identified during phase 1 and 2 testing and listed in inspection report 50-423/85-03. The inspector reviewed the status of the problem identification matrix and the schedule for completion. Each problem type is to be looked at generically to determine if the problem exists for the same valve model elsewhere in the plant. The problem matrix will collect this information on a system by system basis.

Discussion

The valve position indication problem matrix is developing on a system by system basis. The matrix has expanded into six (6) areas of concern. The sixth item concerns the "other traveling nut on reach rod not marked open/closed." Valves 3FPW-V37&41 have been identified to have this problem. Each safety related fluid system has its own sheet(s) which identifies what valve (by mark number) is afflicted with what VPI problem. The matrix is close to being completed. The inspector again indicated his concern with the resolution to VPI problem No. 4 where valves open and close opposite from the standard direction (CCW to open).

Findings

Good progress has been made on the matrix. The licensee has committed to complete the matrix in approximately two weeks (by mid April). At that point, the licensee also will identify the solution to each of the six VPI problems.

6. Emergency Diesel Generator (EDG)Status

Scope

The EDG sets are in the testing stage with EDG "A" mechanical and electrical load testing complete and with EDG "B" preparing for electrical load testing.

Discussion

The inspector held discussions with licensee personnel and vendors representatives on the status and current problems of the EDG sets. One problem of both EDG sets is that they have simplex lube oil filters and, therefore, have to be shut down if lube oil differential pressure becomes too great. This problem is being resolved by licensee's engineering. Another problem with EDG "B" is that a number of fuel oil distribution pumps have seized and have prevented the EDG from operating properly. The licensee is dealing with the problem by flushing of the day tank, fuel oil piping system, fuel oil headers, injectors, fuel distribution pumps, and strainers, as well as considering the possibility of pump binding or particulate matter entering the system.

The licensee is discussing the experienced problems with the vendor to explore the possibility of this problem being generic in nature and to determine if other vendors of EDG sets have had similar problems.

The resolution of these problems and the subsequent testing of these EDG Diesel engines will be closely followed during the next inspection.

7. RCS Hydrostatic Test Preparations

Scope

The RCS code hydrostatic test will consist of pressurizing the reactor coolant system including the four loops, four steam generators, surge line, pressurizer vessel and reactor pressure vessel to 3110 psig for a minimum of 10 minutes as a strength and tightness test of all welds in the systems required by the ASME Boiler & Pressure Vessel Code.

Discussion

The inspector received an updated status of RCS hydrostatic test preparations including all prerequisites to support the test, the approved procedure for the test, diagrams of the pressure boundaries and including discussions with the test director for this test. A walk down was conducted of the systems, components and test equipment supporting the test.

Findings

All of the inspector's questions and concerns were adequately addressed. The final preparations will be examined on the next inspection. The inspector had no further questions in this area.

8. New Fuel Receipt and Storage Preparations

Scope

Fuel receipt and storage consists of receiving new fuel on site from the vendor, inspection of the fuel, dry storage of the fuel in a secure area, and accountability of the fuel.

Discussion

Discussions were held on preparations being made for the receipt of new unirradiated nuclear fuel, and the inspection and storage in the spent fuel pool. The inspector received a draft copy of the fuel receipt inspection and storage procedures including a sequencing schedule of prerequisites, testing, receipt, inspection and storage of the new fuel. Included in the discussions were the areas of preoperational testing, fire protection, security and safeguards, health physics and controls, quality assurance and quality controls. training, and fuel accountability.

Findings

Since this was a preliminary examination of fuel receipt, inspection and storage preparations, this item will be examined in more detail on the next inspection. Areas to be examined are: new fuel assembly and RCCA receipt and inspection; new fuel receiving crane preoperational checklist; new fuel handling crane preoperational checklist; spent fuel pit bridge and hoist preoperational checklist; new fuel elevator preoperational checklist; and new fuel inspection machine functional check. The inspector had no further questions at this time.

9. QA-QC Interface in the Preoperational Test Program

Discussions were held with QA-QC personnel on the involvement of QA-QC in the areas of the RCS Cold Hydro and during the new fuel receipt, inspection, and storage. There will be considerable NUSCO-QA involvement in the form of surveillances. They will, however, not perform full scale test witnessing. NNECO-QC does get involved with test witnessing. This item will be pursued in more detail in subsequent inspections and during test witnessing by NRC inspectors.

10. Plant Tours

The inspector checked on the physical status of the preparation for the RCS Cold Hydro Test presently scheduled for execution in early April. These preparations include cleanup of the Charging Pump Cubicles and the provision of jumpers to accommodate the temporary RCS Hydro piping arrangements. The Hydrolaser (30 gpm) pump will be located outside the Auxiliary Building. The piping for the connection of this pump to the Charging System is ready to go. The pump itself will be installed just before the RCS Cold Hydro start. All completed RCS Hydro preparations were checked. No violations or unacceptable conditions were noted. It was noted by the inspector that all permanent instrumentation was well protected against inadverten physical abuse from construction activities.

Buildings visited included the ESF Building, the Auxiliary Building, the Reactor Building, and the Turbine Building. Cleanliness in the Charging Pump cubicles was very good. The ESF Building was visited the morning after a flooding incident near the A pump of the low pressure safety injection system. Polaroid pictures were taken in the pump room and the room underneath the pump room. These pictures were given to the SRI for his use in evaluating the incident and its consequences. Installed piping insulation in the room below pump A was quite wet. At the time of the inspector's visit (between 8 and 9 a.m.) there was very little standing water in the pertinent rooms. Cleanup operations were in progress. Electrical equipment in the adjacent room appeared to be unaffected by the incident. A report on the incident was being prepared by the operations group.

11. Unresolved Items

Unresolved items are matters about which more information is required to ascertain whether they are acceptable items, items of noncompliance or deviations. An unresolved item, resulting from this inspection, is discussed in Section 4.

12. Exit Interview

At the conclusion of the site inspection on March 22, 1985, and exit meeting was conducted with the licensee's senior site representatives (denoted in Paragraph 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.

ATTACHMENT A

TEST PROCEDURE REVIEW

(1) T3999-P Revision 0, Approved March 4, 1985,
"Pipe and Pipe Support Steady State Vibration Test"

(2) T3327-A Revision 0, Approved March 18, 1985,
"Screen Wash System"

(3) T3323-DA Revision 0, Approved February 27, 1985,
"Gland Seal Steam System"

(4) T3314-DP Revision 0, Approved March 18, 1985,
"ESF Building HVAC"

(5) T3309-P002 Revision 0, Approved March 6, 1985,
"QSS Chemical Addition Tank Drawdown Test"

(6) T3304-AP003 Revision 0, Approved March 11, 1985,
"Boronometer"

(7) T3301-P001 Revision 0, Approved March 18, 1985,
"Reactor Coolant and Associated System Fill and Hydrostatic Test"

(8) 3-INT-2005 Revision 0, Approved March 6, 1985,
"Reactor Cavity Seal Ring"

(9) 3-INT-2001 Computer Programs Test Appendix 3J10 Revision 0, Approved February 14, 1985,
"Sequence of Events"

(10) OP 3211-A Revision 0, Draft Copy,
"New Fuel Assembly and RCC Receipt and Inspection"