U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-423/85-24

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: May 20-24, 1985

Inspectors: H. H. Nicholas, Lead Reactor Engineer — date 6/14/85

H. F. Van Kessel, Reactor Engineer — date 6/14/85

Approved by: L. H. Bettenhausen, Chief
Operations Branch, DRS — date 6/27/85

Inspection Summary: Inspection on May 20-24, 1985 (Inspection No. 50-423/85-24)

Areas Inspected: Routine unannounced inspection of the preoperational test program including test program implementation, emergency diesel generator status, engineered safety feature test status, pre-core hot functional test status, and test procedure review and verification; witnessing of new fuel receipt, inspection and storage; quality assurance and quality control interface; and tours of the facility. The inspection involved 67 hours on site by two NRC region based inspectors.

Results: No items of noncompliance were identified.

DETAILS

1.0 Persons Contacted

Northeast Nuclear Energy Company (NNGCO)

J. Crockett, Superintendent Unit 3
A. Elms, Reactor Engineer
E. Frienze, Startup Engineer
*M. Gentry, Assistant Startup Supervisor
B. Granados, HP Supervisor
N. Hulme, Startup Engineer
K. Jensen, Reactor Engineer
J. McConnell, Reactor Engineer
D. McDaniel, Reactor Engineer
*D. Miller, Jr., Startup Manager
M. Potkin, Startup Engineer
R. Sachatello, HP Supervisor
S. Sudigala, Assistant Startup Supervisor

Northeast Utilities Service Company (NUSCo)

*D. Blumenthal, NQA Engineer
R. Busch, Project Manager
*S. Fankhouser, Generation Engineer
*K. Gray, NQA Staff Assistant
J. LaWare, Engineering Technologist
L. Nadeau, AP Engineer

Stone and Webster Engineering Corporation (SWEC)

*W. Matejek, Project Advisory Engineer

U. S. Nuclear Regulatory Commission (NRC)

*T. Rebelowski, Senior Resident Inspector

*denotes those present at exit interview on May 24, 1985

2. Licensee Action on Previous Inspection Findings (Open)

2.1 Unresolved Item, Valve Position Indication Problems (50-423/85-02-01)

The valve position indication problem matrix as previously described in inspection report 50-423/85-10, has been completed except for the systems which have not completed their phase-1 tests. The Recirculating Spray System (RSS) is one of those systems. Another flooding incident was experienced while attempting to establish a flow path

for the flushing of the RSS through one of the spray rings. This flooding incident was the direct result of not knowing what the exact valve position was for butterfly valve 3RSS*MOV23D, which is one of four containment isolation valves in the suction line of Containment Recirculation Pump *PID. The valve was though to be fully closed and was checked off as such on the Startup Test Valve Lineup check list for the Mini Flow Path Lineup for 3RSS*PIA. In reality the valve was partly open (approximately 10°) and water entered the Containment Structure Sump. The stop for this butterfly valve had not been set yet (a phase-1 item). It was, therefore, possible to move the valve disc through the fully closed position and open the valve again. Positive accurate valve position indication was possible because a scribe mark had been made on the valve stem and valve body by the maintenance people in anticipation of the stop setting. A report on the flooding incident is being prepared by the Licensee as well as by the Senior Resident Inspector.

While this valve position indication problem is temporary, it does highlight again the importance of positive and accurate valve position indication in the transition from phase 1 to phase 2 testing, and, also, the communication of the temporary provision information (scribe mark) to operating personnel.

The inspector requested the Licensee to expedite the completion of the problem matrix and the remaining problem resolutions.

2.2 (Closed) Violation, Equipment to Piping Flange Alignment (50-423/84-04-01)

Holdpoints have been introduced in the rotating equipment alignment procedure (QS 10.31 ML, REv. B) to check on the alignment of equipment flanges to pipe flanges. All rotating equipment has been checked in accordance with the new procedure with exception of the reactor plant component cooling water pumps and the safety injection charging pump . These pumps were checked in accordance with the revised procedure prior to the issue of same. A record to that effect was added to the file by the Licensee (SWEC-FAC). This item is closed.

2.3 (Closed) Unresolved Item, Seismic Duct Weld Design Adequacy (50-423/83-00-16)

The statement and review material from the materials engineering laboratory in connection with Stone and Webster's calculation No. 319, was given to the inspector. The S&W calculation No. 12179-NP(B)-319-ZD was revised to remove the confirmation requirement and attaches the materials engineering laboratory study report which satisfies same. This unresolved Item is closed.

2.4 (Closed) Inspector Followup Item (423/84-22-01)

Broken air pressure gauge on EDG "A" air receiver tank.

The air gauge was removed from the starting air receiver tank, repaired, calibrated, verified, and returned to the tank. The inspector verified all documentation and the gauge in operation.

This Item is closed.

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 Implementation

Scope

The inspector reviewed the Licensee's implementation efforts in the areas of Document Control and Design Changes/ Modifications.

Discussions

In the area of document control six diagrams and four vendor documentation items, as used by test personnel in the course of preoperational testing, were selected and examined by the inspector to verify that current issues were used in completed test or are being used for tests presently being conducted. These selections included flow diagrams for fluid systems (EM-series), FSKs, electrical diagrams, and vendor information for the Emergency Diesel generators. One field-changed drawing was selected to verify that the change was referred to the design engineer for revision of the associated drawings. In the area of design changes/modifications, the inspector reviewed three design change packages to verify that design review, processing and implementation had been achieved in accordance with established procedural controls. The inspector checked the above three packages to verify that appropriate changes were made to test procedures. If changes were introduced after preoperational testing, the inspector verified that appropriate action was taken by the Licensee depending on the impact of the change on the test results. For cases where there is a significant impact, retesting is to be done. The inspector also verified that the cognizant engineer of the system is, or will be, aware of the change. The inspector reviewed temporary jumper log which is kept in the control room. A number of log entries were checked by the

inspector against actual status in the plant. Jumpers were found in their recorded location complete with a tag of the correct tag number. It was learned from the shift supervisor that the jumper administration system had been changed last February to assign one time, unique, tag numbers for jumpers. The new system works well. The inspector observed two fluid systems containing temporary strainers or blank flanges. In both cases, the temporary items had been taken out after use in the test and the associated permanent system items had been restored to pretest conditions.

Findings

No violations, deviations, or discrepancies were observed by the inspector in connection with the preoperational test program implementation review within the areas examined.

3.2 Emergency Diesel Generator (EDG) Status

Scope

The inspector limited his inspection efforts to the fuel oil injection pump failures. Progress in the EDG testing is seriously impacted by this problem.

Discussion

The inspector reviewed the interim results of the Licensee's investigation. The committee is pursuing Colt's determination that the most recent failure was caused by a foreign particle in the fuel oil system: Reference, *NNEC 3-2563, "Committee Investigation of Fuel Oil Injection Pump Failures", May 15, 1985. Flushing methods/criteria and fuel oil system design are closely examined for improvement of fuel oil cleanup prior to fuel oil entry into the fuel oil injection pump. As part of this effort the Day Tank will be cleaned again to eliminate accumulated particulate matter. The piping will be thoroughly flushed again. Also, in the light of fuel oil bypassing of the filter cartridge new duplex filters will be installed. The inspector examined the new filters and the old filters: the old filter showed warpage on the cartridge support plate to which the support spring (coil) is attached with spring retainers which are welded to same. The same plate also supports an O-ring housing via spot welds. Warpage of the old plate appears to be caused by all the spot welding as described above. The new support plate provided by the vendor (Nugent) has the spring retainers punched out of the plate material (no spot welds). The spot welds for the O-ring housing still exist but are considerably reduced in size. The new plates show no warpage at all. Bypassing of the filter, as caused by plate warpage, can be expected to be eliminated. To further improve the filter design, a thicker, more pliable, gasket will be used to

seal the perforated filter stand pipe. A more important discovery was made with respect to the filter housing cover. This cover is a casting and is hollow to a considerable degree. This cover cavity cannot be seen from the outside but through the exit port which is integral with the cover. Particulate matter was found in one of those cover cavities. This sand could be dislodged through vibration and join the filtered fuel oil (cavity is on filter outlet side) on its way to the fuel oil injection pump. The Licensee will ultra clean these covers prior to use or reuse.

Findings

The Licensee is taking the necessary steps to correct the problem of fuel oil contamination. No violations or nonconformances were observed by the inspector.

3.3 Test Procedure Review and Verification

Scope

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

Discussions

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 quality 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.

3.5 ESF Test Preparations Status

Scope

The inspector held discussions with licensee representatives as to the

status of preparations being made for the Engineered Safety Features test including test procedures and prerequisites required to be completed in order to accomplish the test.

The inspector reviewed the test procedures of the ESF test, 3-INT-2003, titled, "ESF Without Loss of Normal Power" and, 3-INT-2004, titled, "ESF With Loss of Normal Power". As these are draft copies, the inspector discussed his concerns and questions with the cognizant engineers, and will review the approved procedures when they are received.

Findings

The inspectors questions and concerns were addressed adequately and the inspector will await receiving of the approved procedures as well as copies of the mini and micro schedules of testing. The inspector had no further questions and will followup on this item.

3.5 Pre-Core Hot Functional Test Preparations Status

Scope

The inspector held discussions with licensee representatives as to the status of preparations being made for the Pre-Core Hot Functional Test including test procedures and prerequisites required to be completed in order to accomplish the tests.

The inspector reviewed the controlling test procedure of the HFT as well as 12 sub system test procedures. All procedures of the HFT test viewed are draft copies, and as such, the inspector discussed his questions and concerns with license representatives and cognizant engineers.

Findings

The inspectors concerns and questions were adequately addressed. The licensee assured the inspector that all approved procedures for the HFT test will forthcoming in the near future for adequate review by the NRC. The inspector had no further questions and will followup on this item.

4.0 Flushing of Recirculation Spray System (RSS) and Water Flooding of Containment Structure (CS) Sump.

Scope

On account of the experienced problems with the water delivery of the RSS pumps, the inspector reviewed the preparations for the flushing of this ESF System in accordance with procedure T3306. The inspector also reviewed the events leading to the flooding of the C.S. Sump. occurring at the start of the flushing operation.

Discussion

The inspector was informed that a long section of tygon hose, found in MOV-20D, was expected to be the major reason for the inadequate pump delivery during the earlier flushing operation. Startup management had decided to flush the containment Recirculation Spray Headers. To accomplish this flush, the individual spray nozzles had to be plugged. The pump problem was encountered during the first attempt to flush the No. 2 spray header. The flow path for this flush was through the No. 2 header, check valve *V-3 (internals removed) and MOV20D. The tygon hose was removed and the flush path for the flush of the number 2 spray header was established. The valve line up for this flush path called for valve MOV-23D to be closed. This valve isolates the Containment (Structure) Sump from the Containment Recirculation Pump suction located in the ESF Building. Failure to establish the position of this valve (see paragraph 2.1 above) accurately led to the flooding incident reported on May 22, 1985. A partial walkdown of the system by the inspector on May 21, revealed that the means to identify the position of MOV-23D accurately were available in the form of a scribe mark on valve stem and valve body. A check, made by the inspector after the flooding incident, of the valve position indicator mounted on the valve operator (locted a considerable distance above the valve body) revealed that the pointer position indicated the valve to be open by approximately the same amount (approximate 10°) as the mismatch of the scribe marks on the valve indicated. The availability of the temporary means for accurate valve position indication, the scribe marks, apparently was not conveyed to the operator who did the valve line up. The operator tried to ascertain the closed position of the valve by turning the hand wheel as far as possible in the closed direction. Since the valve is a butterfly valve and since the valve stop had not been set yet (phase-1), the operator moved the valve beyond the closed position to where the valve started to open again. The inspector talked to the startup people after the incident to determine what other system status items might have led to the incident or might have prevented it. A blind flange had been installed in the flow path (joint EJ-2D) for the flushing prior to the start of the flushing operation. It had been removed to serve in another location. If the flange had been left inplace, the incident would not have occurred. The use of the blind flange, however, was not a prerequisite for this flushing operation. The inspector made a walkdown of the containment's lower elevation, at CR Sump level, to determine the extent of the flooding and the potential water damage to safety related items. While there were some wet spots on the floor and in the recessed portions of the floor around the equipment, there was no apparent damage to any safety related equipment.

Findings

The Senior Resident Inspector will address the flooding incident in his

inspection report as part of his continuing effort on Phase-1 of the startup test program. The valve position indication aspects of the flooding incident are discussed in Section 2.1.

5.0 New Fuel Receipt, Inspection and Storage References

References for the receipt of new fuel, its inspection and storage, are documented in Inspection Report 423/85-14.

Scope

The object of this inspection is to ascertain whether nuclear fuel received at the construction site is properly accepted, safeguarded, inspected and stored in accordance with the NRC license requirements.

Discussion

The witnessing of fuel receipt and storage including inspection, was accomplished by the inspector on a three day period which included the arrival of the transportation truck, and unloading of the seven new fuel casks in the fuel building. Documentation reviewed during this inspection included material transfer log; material accountability log; fuel receipt and inspection form; rod control cluster assembly receipt and inspection form; thimble plug receipt and inspection form; spent fuel pool map for fuel assembly location; visitor control access list area authorization; daily log of access and exposure control; radiation survey sheets; radiation permit; shipping container receipt and inspection sheet; transportation truck bill of lading; and consignment of fuel from Westinghouse Electric Company to Northeast Utilities.

The inspector witnessed receipt, preparation, cleaning, inspection, and storage of four of fourteen fuel assemblies from arrival at the fuel building truck bay to storage in the spent fuel pool. The activities included radiation surveys of the truck; outer metal casks; opening of the casks; the initial survey of the two fuel assemblies in each cask; the removal, cleaning and inspection of each fuel assembly one at a time; the final inspection and measurements at the new fuel inspection station; and the final storage of each fuel assembly in the spent fuel pool. This evolution witnessed by the inspector included fuel assemblies and burnable poison assemblies.

The inspector also reviewed documentation and made observations, on a sampling basis, during this period, in the areas of administration, physical security, health physics and radiation control, reactor engineering, quality assurance and quality control, and housekeeping and cleanliness. QA and QC provided coverage for the entire fuel receipt evolution.

Findings

The inspector verified by review of documentation, discussions with licensees' representatives', and by observation and witnessing, that receipt, inspection, cleanliness, assembly, and storage of new fuel assemblies, was accomplished in accordance with NRC license requirements and licensees' approved procedures.

No items of noncompliance were identified and no discrepancies wee noted during these inspections. The inspector will continue to observe and inspect this evolution of new fuel receipt, inspection and storage subsequent inspections until all fuel is on site. The inspector had no further questions at this time.

6.0 QA/QC INTERFACE

The inspector encountered many indications of QA/QC involvement during the Pre-operational Test program implementation review as described under Section 3.1 above. Items receiving much attention by QA/QC documentation control on field changes, design changes and modifications as guided by DDRs and DMRs and the review of administrative procedures such as ACP-QA 2.06 A and B on the temporary by pass/jumper log book. The inspector also observed the important role played by SWEC-FQC on the resolution of the equipment to pipe flange alignment problem as described under Section 2.2 above.

7.0 Plant Tours

The inspector made several tours of the facility including the containment structure, auxiliary building, turbine building, service building, control building, emergency safety features building, emergency diesel generator rooms, control room, fuel building, and circulating and service water pump house.

Particular attention was given to the emergency diesel generator set problems and and repair work in progress, receipt, inspection and storage of new nuclear fuel; preparations being made for turbine building hot functional test, pre-core hot function test and ESF test preparations, and inspection and observations for housekeeping and cleanliness and protection of components piping and systems. No items of noncompliance were observed during these tours.

8.0 Exit Interview

At the conclusion of the site inspection, on May 24, 1985, on exit meeting was conducted with the License'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. 3-INT-3000 Revision 0, Draft Copy Pre-Core Hot Functional Test
2. 3-INT-3000, Appendix 3002, Revision 0, Draft Copy Reactor Coolant Pump Data.
3. 3-INT-3000, Appendix 3003, Revision 0, Draft Copy RHR System.
4. 3-INT-3000, Appendix 3004, Revision 0, Draft Copy Solid Plant Pressure Control - Heatup.
5. 3-INT-3000, Appendix 3006, Revision 0, Draft Copy SGWLC and Steam Generator Blowdown.
6. 3-INT-3000, Appendix 3007, Revision 0, Draft Copy Thermal Expansion and Restraint Test.
7. 3-INT-3000, Appendix 3010, Revision 0, Draft Copy Main Field Water System.
8. 3-INT-3000, Appendix 3011, Revision 0, Draft Copy Pressurizer Testing.
9. 3-INT-3000, Appendix 30/4 Revision 0, Draft Copy Remote Shutdown With Cooldown.
10. 3-INT-3000, Appendix 3016, Revision 0, Draft Copy Chemical and Volume Control System.
11. 3-INT-3000, Appendix 3019, Revision 0, Draft Copy Auxiliary Field Water.
12. 3-INT-3000, Appendix 3021, Revision 0, Draft Copy Pipe and Pipe Support Transient Vibration Testing.
13. 3-INT-3000, Appendix 3022, Revision 0, Draft Copy Snubber Expansion Examinations.
14. 3-INT-3000, Appendix 3023, Revision 0, Draft Copy Turbine Generator.
15. 3-INT-3000, Appendix 3025, Revision 0, Draft Copy Steam Dump and Controls.
16. 3-INT-3000, Appendix 3027, Revision 0, Draft Copy HFT Primary Relief Value Testing.
17. 3-INT-3000, Appendix 3028, Revision 0, Draft Copy Safety Inspection System.
18. 3-INT-3000, Appendix 3030, Revision 0, Draft Copy RCS Leak Detection.

ATTACHMENT A

19. 3-INT-3000, Appendix 3032, Revision 0, Draft Copy Boron Thermal Regeneration System.

20. 3-INT-3000, Appendix 3036, Revision 0, Draft Copy Feed Water Hammer.

21. T3325-AA Revision 0, Approved May 16, 1985, Circulating Water System.

22. T3329-A Revision 0, Approved May 15, 1985, Condenser Air Removal.

23. T3314-BP Revision 0, Approved May 21, 1985, Fuel and Waste Disposal Building Ventilation.

24. T3321-AP Revision 0, Approved May 20, 1985, Feed Water and Recirculation.