

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-423/85-76

Docket No. 50-423

License No. NPF-44 Priority - Category -

Licensee: Northeast Nuclear Energy Company

P.O. Box 270

Hartford, Connecticut

Facility Name: Millstone Nuclear Power Station, Unit 3

Inspection At: Waterford, Connecticut

Inspection Conducted: December 12-20, 1985

Inspectors: *J E Briggs*
for J. Prell, Reactor Engineer

1/13/86
date

J E Briggs
for H. Nicholas, Reactor Consultant

1/13/86
date

Approved by: *J E Briggs*
for P. Eselgroth, Chief
Test Program Section, OB, DRS

1/13/86
date

Inspection Summary: Routine, unannounced inspection conducted on
December 12-20, 1985 (Report No. 50-423/85-76)

Areas Inspected: Startup program review; post core hot functional testing procedure review and witnessing; initial criticality procedure review; and review of licensee actions on previous findings. The inspection involved 124 hours on-site and 6 hours at the Region I Office by 1 region-based inspector and consultant.

Results: No violations were identified.

8601240173 860116
PDR ADOCK 05000423
G PDR

DETAILS

1.0 Persons Contacted

M. Brown, I&C Supervisor, NNECO
K. Burton, Operational Supervisor, NNECO
*C. Clement, Maintenance Supervisor, NNECO
J. Crockett, MP-3 Unit Superintendent, NNECO
*E. Fries, Startup Engineer, NNECO
J. Harris, Engineering Supervisor, NNECO
D. Miller, Startup Manager, NNECO
D. Moore, Assistant Operational Supervisor
M. Pearson, Assistant Operational Supervisor
*W. Potter, Startup Engineer, Westinghouse
J. Rittar, Shift Supervisor, NNECO
T. Rogers, I&C Planning Coordinator, NNECO
D. Sipple, I&C Technician, NNECO
D. Sullivan, I&C Technician, NNECO
R. Thompson, QC Inspector, NNECO

U.S. Nuclear Regulatory Commission

*T. Rebelowski, Senior Resident Inspector
*T. Shedlosky, Senior Resident Inspector

*Denotes those present at the exit meeting on December 20, 1985.

2.0 Licensee Actions On Previous Inspection Findings

(Closed) Open Item (423/85-55-04) - Operational procedures need to be revised to include OPFORMS.

During inspection 50-423/85-57 a review of the 3200 and 3300 Operating Procedures was made. Included in this review was checking the status and completion of the supporting OPFORMS. In addition a review was made of the Operating Procedure and OPFORM indexes. These reviews showed that although some OPFORMS are being revised all appeared complete in that they included setpoints, valve numbers, instructions, etc.

Based on the above, this item is closed.

(Closed) Open Item (423/85-55-07)

Draft Technical Specification 3.4.1.1 does not authorize three loop operations. Discussions with plant representatives indicate that they expect the final T.S. to authorize three loop operations. If such operations are not approved then three loop operations must be deleted from OP 3301 D and any other procedure which may authorize three loop operations.

In the Final Draft of the Technical Specifications approved by the Commission on November 25, 1985, N-1 Loop Operation has been included. Included also as a license condition was the prohibition against N-1 loop operation until some unresolved issues have been completed to the satisfaction of the NRC staff. Since N-1 operation is now a license condition, this item is closed.

(Open) CDR (423/85-00-17) - pertaining to Amphenol Triax connector (Part No. 34475) failure to meet seismic qualification as reported in Westinghouse Technical Bulletin No. 84-12. Millstone-3 Deficiency Report DDR-351, NUSCO letter No. F07994 to NRC of July 12, 1985 and Work Order Nos. M-3-85-33426, M3-85-33427 and M3-85-33428 were reviewed. None of the above data furnished by licensee supports seismic qualification of the replacement connector. This item remains open pending receipt of seismic qualification data.

3.0 Preoperational Test Program

3.1 Preoperational Test Procedure Review and Verification

Scope

The approved 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.

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.

3.2 Preoperational Test Results Evaluation

Scope

The completed preoperational 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 in the evaluation of completed preoperational tests in order to assure their technical and administrative adequacy.

Discussion

The inspector reviewed the test results and verified the licensee's evaluation of test results by review of: test changes; test exceptions; test deficiencies; "as-run" copy of test procedure; acceptance criteria; performance verification; recording of the conduct of tests; QA inspection records; restoration of system to normal after the test; independent verification of critical steps or parameters; identification of personnel conducting and evaluating test data; and, verification that the test results have been approved.

Findings

No discrepancies or unacceptable conditions were noted in the review of these procedures.

4.0 Startup Program

4.1 References

- Regulatory Guide 1.68, Revision 2, Initial Test Program for Water-Cooled Nuclear Power Reactors
- ANSI 18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants
- Millstone Nuclear Power Station, Unit 3, (MP-3) Technical Specifications
- MP-3 Final Safety Analysis Report
- MP-3 Safety Evaluation Report
- Millstone-3 Fuel Load Through Warranty Run Working Schedule

4.2 Startup Test Witnessed

Scope

Using the 3-INT-4000 Series Test Procedures:

- 3-INT-4000 "Initial Fuel Load", Approved 11/8/85
- 3-INT-4002 "Open Alignment Nuclear Instrumentation", Approved 10/29/85
- 3-INT-4003 "Core Load Instruments and Neutron Source Requirements",
Approved 11/8/85
- 3-INT-4004 "Inverse Count Rate Ratio Monitor", Approved 11/8/85
- 3-INT-4005 "Initial Core Loading", Approved 11/8/85
- 3-INT-4006 "Core Map", Approved 11/8/85

The inspector witnessed, on a sampling basis, the movement of fuel bundles from their storage space in the spent fuel pool through the transfer canal into containment and ultimately loaded into the reactor pressure vessel. The inspector verified that 1 hour, 8 hour, 72 hour and 7 day checks were being made and documented including the method and results for calculation of the inverse count rate ratio during the initial fuel loading.

Inspection and witnessing verified that the initial core loading was accomplished in a safe and organized manner due to a preestablished loading sequence which resulted in an early neutronic coupling between the source range channels. At the completion of the initial fuel loading of the pressure vessel, the inspector verified by observation and review of documentation that core mapping was performed in order to verify correct loading of the core. A permanent video record was obtained of the initial fuel load in the core.

Portions of the following Post Core Hot Functional Tests were witnessed. This included the initial test preparation and test restoration of the system as well as witnessing the actual test.

- 3-INT-5000, Appendix 5004, Revision 0, "Rod Control Slave Cyclor and CRDM Timing"
- 3-INT-5000, Appendix 5008, Revision 0, "Rod Drop Testing"
- 3-INT-5000, Appendix 5011, Revision 0, "Movable Incore Detection System"

These tests were witnessed for the following attributes:

1. Appropriate procedure revision was available and in use by all crew members.
2. Minimum crew requirements were met.

3. All test prerequisites and initial conditions were met and/or those which were waived were reviewed/approved in accordance with procedure/technical specification (TS) requirements.
4. Test equipment required by the procedure was calibrated and in service.
5. Test data equipment required by the procedure was calibrated to a common time base.
6. Test was performed as required by a technically adequate procedure.
7. Crew actions appeared to be correct and timely during the performance of the test. Coordination was adequate.
8. Quick summary analysis was made to assure proper plant response to the test.
9. All data was collected for final analysis by the proper personnel.
10. Overall test acceptance criteria were met.
11. The licensee's preliminary test evaluation was consistent with inspector's observation.
12. Adherence to TS requirements was maintained for those tests which affect TS LCOs.

Discussion

3-INT-5000, Appendix 5004 - The inspector witnessed the withdrawal and insertion timing tests for the Control Rod Drive Mechanisms. A review of the resulting trace was made and compared with the normal trace for CRDM withdrawal and insertion. These traces simultaneously plotted lift coil current, moveable coil current, stationary coil movement, and sound versus time. Questions raised by the inspector concerning the results of the test and the licensee review of the traces were satisfactorily answered by the licensee. QC was present during the test .

3-INT-5000, Appendix 5011 - The inspector witnessed from the control room the test used to establish the path lengths for the in-core detector system, verify that all thimbles are free of obstructions, and demonstrate system operability. The system was operated from the console in both manual and automatic mode. Personnel stationed inside containment verified detectors entered proper thimbles. QC witnessed portions of this test.

3-INT-5000, Appendix 5008 - The inspector witnessed a portion of the tests used to establish the drop time of each control rod with the RCS in cold no flow condition. (All RCP's were off and only one RHR pump was operating. The percentage of flow contributed by the RHR was less than 1.0%. RCS temperature was approximately 100°F and PZR pressure was approximately 400 psia). The drop time test for those control rods witnessed were well within TS requirements - 1.3 seconds versus 2.2 seconds. Problems did occur during the initial setup with the computer but they were satisfactorily resolved. Three rods fell outside the two sigma limit and were scheduled to be retested. Westinghouse personnel were present to act in an advisory manner and help evaluate initial results. QC was also present.

Findings

No violations were identified.

5.0 Surveillance Tests Required For Initial Criticality

Scope

The inspector reviewed 28 Surveillance Test procedures listed in Appendix D associated with technical specification requirements needed prior to entering Modes 3 and 4 in order to verify their completion and compliance with administrative requirements. The inspector also reviewed 20 completed surveillances listed in Appendix E for compliance with technical specification and other regulatory requirements. In addition, two surveillance tests (denoted by W in Appendix D) were witnessed to verify compliance to the procedure and technical specifications.

Findings

All technical specifications reviewed were included in the licensee master surveillance index. Out of a total of 194 operational surveillance tests which must be completed prior to entering Modes 3 and 4, 113 had been completed by December 19, 1985. All of the I&C surveillance tests for entering mode 4 were complete. A few minor problems identified with the test procedures had been previously identified by the licensee and appropriate corrective action was being taken.

The review of one test surveillance, SP3610A1-1 dated November 21, 1985, showed that the calibration due dates of two instruments, vibration analyzer and 3RHS-FI610, were out of date. A subsequent investigation showed that the test personnel had written the date the instruments were calibrated rather than the calibration due date and that the instruments were well within the calibration period. However this data sheet had been reviewed and approved by several levels of management. Management

was made aware of the problem and gave orders to provide greater attention to the calibration due dates on surveillance tests. The inspector reviewed 19 other surveillance tests and did not identify any further problems.

6.0 Independent Calculation

During the review of test results for post core hot functional tests, Appendix 5004 and Appendix 5008, the inspector reviewed the output of 12 control rod traces and independently determined compliance with the acceptance criteria.

7.0 Quality Assurance/Control Interface

The inspector verified that QC was present during the three PCHFT and two surveillance tests witnessed. The inspectors were questioned and appeared knowledgeable of the test procedures.

8.0 Plant Tours

The inspector made several tours of the facility during the course of the inspection. This included tours of the ESF building, auxiliary building, control building and control room. A review of the work in progress, security, cleanliness and housekeeping was made.

9.0 Exit Meeting

An exit meeting was held on December 20, 1985 to discuss the inspection scope and findings, as detailed in this report (see paragraph 1.0 for attendees).

At no time was written material given to the licensee. The inspector determined that no proprietary information was utilized during this inspection.

ATTACHMENT A

Preoperational Test Procedure Reviews

- (1) T3720-BP Revision 1, Approved 12/11/85
Station Emergency Lighting
- (2) T3313-FP Revision 1, Approved 12/9/85
Containment Vacuum System

ATTACHMENT B

PREOPERATIONAL TEST RESULTS
EVALUATIONS

- (1) T3324-AA Revision 0, Approved 6/14/85
Main Generator Protection
Test results approved 12/16/85
- (2) T3314-DP Revision 0, Approved 3/18/85
ESF Building HVAC
Test results approved 12/16/85
- (3) T3308-P002 Revision 0, Approved 6/17/85
High Pressure Safety Injection System
Test results approved 12/16/85
- (4) T3307-AP001 Revision 0, Approved 2/25/85
Low Pressure Safety Injection System
Test results approved 12/16/85
- (5) T3323-AA001 Revision 1, Approved 4/10/85
Electro Hydraulic Control
Test results approved 10/23/85
- (6) 3-INT-2006 Revision 0, Approved 6/7/85
Turbine Building Hot Functional
Test results approved 12/11/85
- (7) 3-INT-3000 Pre-Core Hot Functional Testing
Appendix 3022 Revision 0, Approved 9/20/85
Snubber Expansion Examinations
Test results approved 12/11/85

ATTACHMENT C

STARTUP TEST PROCEDURE REVIEW

Test procedure review for administrative and technical adequacy.

- (1) 3-INT-4000, Revision 0, Approved 11/8/85
Initial Fuel Load - Controlling Procedure
- (2) 3-INT-4000, Appendix 4002 Revision 0, Approved 10/29/85
Operational Alignment-Nuclear Instrumentation System
- (3) 3-INT-4000, Appendix 4003 Revision 0, Approved 11/8/85
Core Load Instruments and Neutron Source Requirements
- (4) 3-INT-4000, Appendix 4004 Revision 0, Approved 11/8/85
Inverse Count Rate Ratio Monitoring
- (5) 3-INT-4000, Appendix 4005 Revision 0, Approved 11/8/85
Initial Core Loading
- (6) 3-INT-4000, Appendix 4006, Revision 0, Approved 11/8/85
Core Map
- (7) 3-INT-5000 Revision 0, Approved 12/10/85
Post Core Hot Functional Test-Controlling Procedure
- (8) 3-INT-5000, Appendix 5001, Revision 0, Approved 9/23/85
Shutdown Margin
- (9) 3-INT-5000, Appendix 5002, Revision 0, Approved 11/9/85
RTD Cross Calibration
- (10) 3-INT-5000, Appendix 5004, Revision 0, Approved 11/9/85
Rod Control Slave Cyclers and CRDM Timing
- (11) 3-INT-5000, Appendix 5008, Revision 0, Approved 11/9/85
Rod Drop Testing
- (12) 3-INT-5000, Appendix 5011, Revision 0, Approved 12/5/85
Movable In-Core Detector Operation
- (13) 3-INT-5000, Appendix 5032, Revision 0, Approved 12/5/85
Boron Thermal Regeneration System
- (14) 3-INT-5000, Appendix 5015, Revision 0, Approved 11/9/85
Digital Rod Position Indication Operational Test

ATTACHMENT C (cont'd)

- (15) 3-INT-5000, Appendix 5010, Revision 0, Approved 12/11/85
RTD Bypass Loop Verification
- (16) 3-INT-5000, Appendix 5009, Revision 0, Approved 11/14/85
Precritical RCS Flow Measurement
- (17) 3-INT-5000, Appendix 5007, Revision 0, Approved 12/11/85
Pressurizer Heaters and Spray
- (18) 3-INT-5000, Appendix 5006, Revision 0, Approved 12/11/85
RCS Leak Detection
- (19) 3-INT-5000, Appendix 5016, Revision 0, Approved 12/16/85
Loose Parts Monitoring System
- (20) 3-INT-5000, Appendix 5031, Revision 0, Approved 12/16/85
Chemical and Volume Control System

APPENDIX D

SURVEILLANCE PROCEDURES REVIEWED

- (1) SP3601B.1, Revision 0, RCS Vent Valve Line up
- (2) SP3602B.2, Revision 0, RCS Vent Path Operability Check
- (3) SP3601D.1, Draft, RCP Operability in Mode 4
- (4) SP3601F.3, Revision 0, RCS Leakage-Controlled Leakage to RCP Seals
- (5) SP3601F.4, Revision 0, Reactor Coolant System Pressure Isolation Valve Test
- (6) SP3601G.1, Revision 0, RCS Vent Path Valve Operability Test
- (7) SP5604A-1, Revision 0, A Charging Pump Flow Test
- (8) SP3604A-2, Revision 0, B Charging Pump Flow Test
- (9) SP3604A-3, Revision 0, C Charging Pump Flow Test
- (10) SP3604A-6, Revision 0, Charging Pump Inoperability Verification
- (11) SP3604C.1, Revision 0, Borated Water Source and Flow Path Verification
- (12) SP3604C.2, Revision 0, Monthly Borated Water Source Flow Path Verification
- (13) SP3604C.3, Revision 0, Operating Borated Water Source Flow Path
- W(14) SP3609.1, Revision 0, Quench Spray Pump 3QSS.P3A Operational Readiness Test
- W(15) SP3609.2, Revision 0, Quench Spray Pump 3QSS.P3B Operational Readiness Test
- (16) SP3610A.1, Revision 0, Residual Heat Removal Pump 3 RHS.P1A Operational Readiness Test
- (17) SP3610A.2, Revision 0, Residual Heat Removal Pump 3 RHS-P1B Operational Readiness Test
- (18) SP3646A.1, Revision 1, A Emergency Diesel Generator Operability Test
- (19) SP3646A.2, Revision 1, B Emergency Diesel Generator Operability Test
- (20) SP3646A.2, Revision 0, Diesel Generator Independence Test
- (21) SP3670 1, Revision 0, Control Room Surveillances

- (22) SP3446B11, Revision 0, Solid State Protection System (SSPS)
Operational Test
- (23) SP3446B11, Revision 0, Refueling SSPS Tests
- (24) SP3446F31, Revision 0, Containment Drain Sump Level and Pump
Capacity Monitoring System
- (25) SP3448E11, Revision 0, EGLS Autotest Test
- (26) SP3449C01, Revision 0, Containment RCS Leakage Detection Channel
Calibration
- (27) SP3449C11, Revision 0, RCS Leakage Detection Monitor Analog Channel
Operational Test (3CMS.RE22A/B)

APPENDIX E

SURVEILLANCE TEST RESULTS REVIEWED

- (1) SP3610A.1-1, Residual Heat Removal Pump 3RHS.P1A Operational Readiness Test
- (2) SP3610A.1-2, RHR Pump Discharge Check Valve Surveillance
- (3) SP3612B.4-1, Type C LLR Test
- (4) SP3616A.1-2, Quarterly Terry Turbine Supply and NonReturn Valves Stroke Time Testing
- (5) SP3616A.1-5, Quarterly Stroke Time and Failure Mode Testing of Terry Turbine Steam Isolation and Steam Line Isolation Valves
- (6) SP3616A.1-6, Quarterly Stroke Time Testing of Main Steam Pressure Relief Bypass and Relief Isolation Valves
- (7) SP3622.3-1, Auxiliary Feedwater Pump 3FWA.P2, Operational Readiness Test
- (8) SP3626.4-1, Service Water Pump 3SWP.P1A Operational Readiness Test
- (9) SP3626.4-2, Stroke Time Test for Service Water Valves
- (10) SP3626.5-1, Service Water Pump 3SWP-P1B Operational Readiness Test
- (11) SP3626.7-1, Service Water Pump 3SWP.P1D Operational Readiness Test
- (12) SP3626.9-1, Control Building Air Conditioning Booster Pump 3SWP.P2B Operational Readiness Test
- (13) SP3626.11-1, MCC and Rod Control Area Booster Pump B Operational Readiness Test
- (14) SP3626.11-1, Service Water Heat Exchanger Fresh Water Layup
- (15) SP3446B11, Solid State Protection System (SSPS) Operational Test
- (16) SP3446F31, Refueling SSPS Tests
- (17) SP3447B02, Containment Drain Sump Level and Pump Capacity Monitoring System
- (18) SP3448E11, EGLS Autotest Test
- (19) SP3449C01, Containment RCS Leakage Detection Channel Calibration
- (20) SP3449C11, RCS Leakage Detection Monitor Analog Channel Operational Test 3CMS.RE22A/B)