

U.S. NUCLEAR REGULATORY COMMISSION
Region I

Report No. 50-245/82-17
50-336/82-19
Docket No. 50-245
50-336
License No. DPR-21 Priority --- Category C
DPR-65
Licensee: Northeast Nuclear Energy Company
P.O. Box 270
Hartford, Connecticut 06101

Facility Name: Millstone Nuclear Power Station, Units 1 & 2

Inspection at: Waterford, Connecticut 06385

Inspection conducted: August 8 thru September 25, 1982

Inspectors: J. T. Shedlosky
J. T. Shedlosky, Sr. Resident Inspector

9/27/82
date signed

D. R. Lipinski
D. R. Lipinski, Resident Inspector

27 September 1982
date signed

date signed

Approved by: T. C. Elsasser
T. C. Elsasser, Chief
Reactor Projects Section 1B,
Division of Project & Resident Programs

Oct. 5, 1982
date signed

Inspection Summary:

Unit 1: Routine facility safety inspections, August 8 thru September 25, 1982 (Report Number 50-245/82-17) including: evaluations of plant operations, refueling operations, equipment alignments and readiness, radiation protection, physical security, fire protection, plant operating records, maintenance and modifications, surveillance testing and calibrations, and reporting to the NRC. The inspection involved 114 hours of onsite, regular, and backshift inspection effort by two resident inspectors.

Results: No Violations were identified.

Unit 2: Routine facility safety inspections, August 8 thru September 25, 1982 (Report Number 50-336/82-19) including: evaluations of plant operations, equipment alignments and readiness, radiation protection, physical security, fire protection, plant operating records, maintenance and modifications, surveillance testing and calibrations, and reporting to the NRC. The inspection involved 125 hours of onsite, regular, and backshift effort by two resident inspectors.

Results: No Violations were identified.

DCS IDENTIFICATION NUMBERS

NRC INSPECTION REPORT 245/82-17
336/82-19

<u>DCS NUMBER</u>	<u>REPORT PARAGRAPH</u>
50245-820216 ✓	6
50245-820310 ✓	6
50245-820817 ✓	6
50245-820824 ✓	6
50336-820715 ✓	6
50336-820712 ✓	6
50336-820722 ✓	6
50336-820722 ✓	6
50336-820801 ✓	6
50336-820812 ✓	6
50336-820917	3

DETAILS

1. Persons Contacted

The below listed technical and supervisory level personnel were among those contacted:

J. Crockett, Unit 3 Superintendent
F. Dacimo, Quality Services Supervisor
E. C. Farrell, Station Services Superintendent
B. Granados, Health Physics Supervisor
H. Haynes, Unit 2 Instrumentation and Control Supervisor
R. J. Herbert, Unit 1 Superintendent
J. Kangley, Chemistry Supervisor
J. Keenan, Unit 2 Engineering Supervisor
J. J. Kelley, Unit 2 Superintendent
E. J. Mroczka, Station Superintendent
V. Papadopoli, Quality Assurance Supervisor
R. Place, Unit 2 Engineering Supervisor
R. Palmieri, Unit 1 Engineering Supervisor
W. Romberg, Unit 1 Operations Supervisor
S. Scace, Unit 2 Operations Supervisor
F. Teeple, Unit 1 Instrumentation and Control Supervisor
W. Varney, Unit 1 Maintenance Supervisor
P. Weekley, Security Supervisor

2. Status of Open Items

New Items:

Unit 1 - None

Unit 2 -

356/82-19-01, Unresolved. Tracability of Steam Generator weld inspection to inspector and engineering evaluation to demonstrate acceptable continued plant operation. (Report paragraph 8)

Old Items:

Unit 1 -

245/79-14-06, (Closed). The use of Continuous Air Monitoring equipment on the refueling floor has been reviewed by the Health Physics Supervisor. Plant procedures (HP940, Revision 3, dated 6-23-82) have been revised to

Status of Open Items (cont'd.)

require use of this equipment during periods of work inside the reactor vessel and during other times deemed appropriate by the Health Physics technicians. The inspectors will continue to observe radiological surveys during the course of the present refueling outage. This item is closed.

245/79-15-02, (Closed). This item was opened to track the evaluation and repair of cracks in the "C" Reactor Building Closed Cooling Water (RBCCW) Heat Exchange foundation. These cracks have been repaired and have not recurred. The licensee's corporate engineering staff has conducted an evaluation of the foundations and determined that no further modifications are needed.

245/80-21-04, (Closed). This item addressed cross-training of fire brigade members between Units 1 and 2. The inspector reviewed the respective fire brigade training instructions for Units 1 and 2. Both training programs require specific certification of cross-training by a supervisor in individual brigade member's training records. The inspector reviewed a sample of training records to confirm that such certifications were routinely occurring. This item is closed.

245/81-06-03, (Closed). This item was opened to follow improved controls over segmented test bundles. This matter is addressed in the Preparation for Refueling inspection documented in paragraph No7 of this report. This item is closed.

Unit 2 - NoneCombined Units 1 and 2

245/81-15-01 & 336/81-13-01, (Closed). This noncompliance concerned excessive water in radioactive waste solidified using Urea Formaldehyde. The problem of the evolution of water in containers of radioactive waste solidified using Urea Formaldehyde appears to be generic to that solidification process. The licensee has committed to not solidify wastes using this method in the future. Solidification equipment for this technique has been returned to Chem-Nuclear System in Barnwell, South Carolina. The inspectors will continue to closely monitor the radioactive waste quality assurance program in the course of routine safety inspections. This item is closed.

3. Review of Plant Operation - Plant Inspection (Units 1 and 2)

The inspectors reviewed plant operations through direct inspection and observation of Units 1 and 2 throughout the reporting period. Unit 1 operated at full power through the nominal end-of-core-life and conducted a power coast-down until September 10. The unit entered a refueling outage on September 11. Unit 2 operated at full power through the period with the exception of a reactor trip on September 17.

a. Instrumentation

Control room process instruments were observed for correlation between channels and for conformance with Technical Specification requirements. No unacceptable conditions were identified.

b. Annunciators

The inspector observed various alarm conditions which had been received and acknowledged. These conditions were discussed with shift personnel who were knowledgeable of the alarms and actions required. During plant inspections, the inspector observed the condition of equipment associated with various alarms. No unacceptable conditions were identified.

c. Shift Manning

The operating shifts were observed to be staffed to meet the operating requirements of Technical Specifications, Section 6, both to the number and type of licenses. Control room and shift manning was observed to be in conformance with Technical Specifications and site administrative procedures.

d. Radiation Protection Controls

Radiation protection control areas were inspected. Radiation Work Permits in use were reviewed and compliance with those documents as to protective clothing and required monitoring instruments was inspected. Proper posting of radiation and high radiation areas was reviewed in addition to verifying requirements for wearing of appropriate personal monitoring devices. There were no unacceptable conditions identified.

e. Plant Housekeeping Controls

Storage of material and components was observed with respect to prevention of fire and safety hazards. Plant housekeeping was evaluated with respect to controlling the spread of surface and airborne contamination. There were no unacceptable conditions identified.

f. Fire Protection/Prevention

The inspector examined the condition of selected pieces of fire fighting equipment. Combustible materials were being controlled and were not found near vital areas. Selected cable penetrations were examined and fire barriers were found intact. Cable trays were clear of debris. There were no unacceptable conditions identified.

g. Control of Equipment

During plant inspections, selected equipment under safety tag control was examined. Equipment conditions were consistent with information in plant control logs.

h. Instrument Channels

Instrument channel checks recorded on routine logs were reviewed. An independent comparison was made of selected instruments. No unacceptable conditions were identified.

i. Equipment Lineups

The inspector examined the breaker position on switchgear and motor control centers in accessible portions of the plant. Equipment conditions, including valve lineups, were reviewed for conformance with Technical Specifications and operating requirements. No unacceptable conditions were identified.

j. Reactor Refueling Operations (Unit 1)

The inspectors observed reactor vessel defueling. Fuel movements were conducted in accordance with approved procedures and under appropriate supervisory control. No unacceptable conditions were observed.

k. Reactor Trip of September 17, 1982 (Unit 2)

At 2245 on September 17, 1982, Millstone Unit 2 experienced a trip from full power. A pressure transmitter (Rosemont type 1104A) failed in the Electro-Hydraulic Control (EHC) system. This failure caused the EHC system to shut the main turbine control valves. Primary pressure rose rapidly to the Pressurizer Pressure High scram setpoint (2400 psi) and the Power Operated Relief Valve (PORV) setpoint (2400 psi). The pressure transient was terminated by the action of the PORVs and pressurizer sprays.

All safety systems functioned properly during the transient. The reactor was made critical at 0518 on September 18 and returned to power on September 20.

The inspector had no further questions on this matter.

4. Review of Plant Operations - Logs and Records - (Units 1 & 2)

During the inspection period, the inspector reviewed operating logs and records covering the inspection time period against Technical Specifications and Administrative Procedure Requirements. Included in the review were:

Shift Supervisor's Log	- daily during control room surveillance
Plant Incident Reports	- 8/8/82 through 9/25/82
Jumper and Lifted Leads Log	- all active entries
Maintenance Requests and Job Orders	- all active entries
Construction Work Permits	- all active entries
Safety Tag Log	- all active entries
Plant Recorder Traces	- daily during control room surveillance
Plant Process Computer Printed Output	- daily during control room surveillance
Night Orders	- daily during control room surveillance

The logs and records were reviewed to verify that entries are properly made; entries involving abnormal conditions provide sufficient detail to communicate equipment status, deficiencies, corrective action restoration and testing; records are being reviewed by management; operating orders do not conflict with the Technical Specifications; logs and incident reports detail no violations of Technical Specification or reporting requirements; and logs and records are maintained in accordance with Technical Specification and Administrative Control Procedure requirements.

There were no unacceptable conditions identified.

5. Review of Periodic and Special Reports

Upon receipt, periodic and special reports submitted by the licensee pursuant to Technical Specification 6.9.1 and 6.9.2 and Environmental Technical Specification 5.6.a were reviewed by the inspector. This review included the following considerations: the report includes the information required to be reported by NRC requirements; test results and/or supporting information are consistent with design predictions and performance specifications; planned corrective action is adequate for resolution of identified problems; determination of whether any information in the report should be classified as an abnormal occurrence; and the validity of reported information. Within the scope of the above, the following periodic reports were reviewed by the inspector:

- Monthly Operating Report, Units 1 & 2, July, 1982.
- Monthly Operating Report, Units 1 & 2, August, 1982.
- Semi-Annual Radioactive Effluents Release Report, January 1, 1982 to June 30, 1982.

6. Licensee Event Reports (LERs)

The inspector reviewed the following LERs to verify that the details of the event were clearly reported including the accuracy of the description of cause and adequacy of corrective action. The inspector determined whether further information was required, and whether generic implications were involved. The inspector also verified that the reporting requirements of Technical Specifications and Station Administrative and Operating Procedures had been met, that appropriate corrective action had been taken, that the event was reviewed by the Plant Operations Review Committee, and that the continued operation of the facility was conducted within the Technical Specification limits.

Unit 1

- 82-15 Setpoint drift in 1 of 8 Main Steam Isolation Valve position limit switches and late report due to management oversight.
- 82-16 Failure to continuously monitor stack gas activity over a period of approximately 12 hours due to personnel error. Off-gas radiation monitors remained in service.

Both reports 82-15 and 82-16 were submitted late. The inspectors discussed the problem of late reporting with senior plant management. The licensee is committed to maintaining closer controls over event reporting in the future.

- 82-17 Failure of Emergency Gas Turbine Generator due to fouling of air start motor with rust on August 17 and 24. This event is similar to 82-13 and 81-20. The inspectors are following Gas Turbine air system modifications under open item 81-11-01.

Unit 2

- 82-30 Failure of Control Element Assembly Motion Inhibit during plant start-up. This failure is discussed in Inspection Report 50-336/82-16 paragraph 3.
- 82-31 Failure of 1 of 2 Enclosure Building Filtration Systems.
- 82-32 Reactor Coolant System leakage in excess of 1 gallon per minute. This event is discussed in Inspection Report 50-336/82-16 paragraph 3.
- 82-33 Turbine driven auxiliary feed pump inoperable due to maladjustment in steam supply valve.

Unit 2 (cont'd.)

- 82-34 Surveillance testing of containment air lock not conducted during plant heatup due to management oversight.
- 82-35 Unexpected power and pressure reduction due to excessive boration of the reactor coolant system.

7. Preparation for Refueling - Unit 1a. Scope

A review was conducted of plans and preparations for the Unit 1 refueling outage. Procedures for fuel handling, transfers, core verification, inspection of fuel to be re-used, and for handling and inspection of core internals were evaluated using the requirements of ANS18.7-1972. Policies for the conduct of refueling concerning communications, control of plant and refueling operations, shift manning, and shift turnover were discussed with senior plant personnel.

b. Documents Reviewed

1. Plant Procedures

OP253	Refuel Bridge Training	Revision 0	6-31-82
OP328B	Fuel Loading/Unloading/Shuffling	Revision 5 CH-1	3-13-81
OP328C	Fuel Transfer Using Refuel Bridge	Revision 6 CH-1	3-26-81
OP328D	Control Rod Removal & Replacement From Reactor Core	Revision 3	7-10-80
RE1001	SNM Inventory and Control	Revision 5	7-21-82
RE1056	Core Loading Reactivity Monitoring*	Revision 0	3-23-81
RE1075	Fuel Cell Inspection	Revision 1	1-9-80
RE1077	Reactor Core Verification	Revision 3	3-21-81

2. Vendor Procedures approved by Plant Operations Review Committee (PORC)

GE246-GP22	Generic Procedure for Reactor Site Receiving, Inspection, and Packaging of Individual Fuel Bundle Components
GE246-GP21	Generic Procedure for Plunge Gage Measurement
GE246-GP20	Revision 1 Generic Procedure for Segmented Rod Program Reconstitution and Retrieval
GE246-GP1	Revision 3 Fuel Bundle Upper Tie Plate Removal and Installation Procedure

*Review included verification of the accompanying BASIC computer program used to compute core reactivity changes.

c. Findings

Procedure preparations for the cycle 9 refueling were completed in a timely manner. Prerequisites were found to address the status and testing of plant systems required for refueling, inspection of replacement fuel and internals, conditions for spent fuel movement, status of fuel handling equipment interlocks, and the designation and control of proper tools. Procedures governing planned evolutions were found to address the reactivity status of the core; minimum operable instrumentation; step-wise instructions for the sequence, orientation, and seating of fuel and components; criteria for halting refueling operations; and containment status. Also addressed were responsibilities and duties of personnel, communications, Special Nuclear Material (SNM) accountability, shift turnover, rules for intervals when refueling is interrupted, and core verification. Plans for the eventuality of fuel damage during refueling were in place.

The cycle 9 fuel loading will continue to reflect the control cell core concept in fuel arrangement. Changes in Technical Specifications for the coming cycle have been proposed including extended load line limits, improved calculational methods for determining the Minimum Critical Power Ratio thermal limit, and removal of the power spiking "penalty" from thermal-hydraulic calculations.

No unacceptable conditions were identified.

The inspector reviewed measures taken to prevent errors in the reconstitution of the Segmented Test Bundle (STB) as occurred during the cycle 8 fuel loading. Vendor procedures approved by the Plant Operations Review Committee (PORC) now contain suitable cautions and requirements for segment serial number recording and verification.

Inspector Follow Item 245/81-06-03 is closed.

8. Steam Generator Maintenance and Modifications - Unit 2

The inspector reviewed documentation packages for the work performed in the Millstone Unit 2 Steam Generators. Activities included, but were not limited to, the installation of modifications to Steam Generator Nozzles to accept Nozzle Water Dams, and the installation and seal welding of Steam Generator Tube Plugs.

The following documents were reviewed:

- PDCR 2-96-80, Modification of Steam Generator Nozzles to Accept Nozzle Dams
- Job Order 282-109, Modification of Steam Generator Nozzles
- Job Order 282-309, Removal of Three No. 1 Steam Generator Tubes for Analysis
- Job Order 282-309A, Designation of a Fourth Tube for Removal and Deletion of an Original Tube
- Job Order 282-309B, Repair Leaking Steam Generator Tube Plug Weld No. 1 Steam Generator, Hot Leg, Line 110, Row 102 and Install Welded Tube Plugs in Cut Tubes

- Job Order 282-309C, Repair Leaking Steam Generator Tube Plug No. 2 Steam Generator, Hot Leg, Line 140 Row 104
- Job Order 282-333, Preparation of Steam Generators for Installation of Mechanical Tube Plugs
- Job Order 282-359, Removal of Nozzle Dams
- Job Order 282-380, Removal and Reinstallation of Welded Tube Plugs No. 1 & 2 Steam Generators Because of Leaking Welds

The following Nonconformance Reports were written by the licensee during this work.

- NCR 281-103, CCTV Camera installed prior to nozzle debris plugs, out of procedural sequence;
- NCR 281-104, Nozzle Dam inserts provided without NDT UT/PT results;
- NCR 281-108, No. 1 Steam Generator, Sixteen holes not brushed prior to welding;
- NCR 281-109, No. 1 Steam Generator, Eight welds were not circular;
- NCR 281-110, Steam Generator, Pins will not fit two-pin inserts;
- NCR 281-111, No. 1 Steam Generator, Hot Leg, Arc strikes in cladding;
- NCR 281-114, No. 2 Steam Generator, One hole drilled oversized;
- NCR 282-007, Sub-contractor NDT inspectors determined not qualified to ANSI/ASME N45.2.6 - 1978 and Regulatory Guide 1.58, September 1980;
- NCR 282-009, Contractor NDT inspectors lacking documentation certification required by ANSI/ASME N45.2.6-1978;
- NCR 282-016, No. 1 Steam Generator, Hot Leg, Outboard Nozzle Dam Pin No. 5, Can't be installed due to a misalignment;
- NCR 282-019, No. 1 Steam Generator, Hot Leg, Nozzle Dam Insert weld repairs require liquid penetrant testing, only visual examination was performed;
- NCR 282-020, No. 1 Steam Generator, Tube cutter stuck and broke in Tube, line 68 row 52;
- NCR 282-031, During the removal of a Welded Tube Plug, Tube Plug to Tube sheet weld damaged;
- NCR 282-040, Work Package for Steam Generator Nozzle Dam Modifications lost by contractor.

In-process verification checks and final weld inspections required by the procedures implemented in the Job Orders were conducted by the contractor for Steam Generator maintenance, modifications and inspections. Their inspection personnel were augmented with additional sub-contractor personnel. All worked within the contractor's organization following the contractor's procedures.

The inspector attempted to reconcile the completion of in-process verifications and inspections required by the procedures. The following problems became apparent:

- Job Order 282-109, which documented completion of the Nozzle Dam modification, including the inspection results, had been lost by the contractor. A reconstructed package, on file, is of unknown accuracy. (Loss of the original working copy was documented in a Millstone Nonconformance Report, NCR 282-040, dated March 4, 1982.)

- Acceptance signatures for inspections performed in the Steam Generator Plugging documents are those of contractors only. Radiation exposure records demonstrate that the inspections were performed by sub-contractor personnel in addition to contractor personnel.

The lack of tracability from acceptance inspection to an inspector for a specific activity is considered to be Unresolved (336/82-19-02), which will be followed during future inspections.

During telephone conversations between licensee and Region I management on September 14 and 23, commitments were made to provide an engineering analysis to demonstrate that continued plant operation would be acceptable, pending resolution of weld inspection data.

Based on observations made by the licensee's Quality Assurance organization, an audit was conducted of the contractors Quality Assurance group on July 9.

The inspector found that licensee records concerning security access to the station supported the fact that certain subcontractor personnel were on site and were granted access to the containment. Personnel dosemetry records detail the radiation exposures for those personnel. These exposures are consistent with that expected from Steam Generator work. Termination reports for those persons were verified to have been sent as required by 10CFR 20.408.

A review of Radiation Work Permit (RWP) histories showed that those persons were signed in only on RWP's assigned to contractor for Steam Generator work. The dates of exposure correlate with dates when inspections occurred. These subcontractor personnel did not turn up in any other type of RWP.

Additional inspections conducted in this area are documented in reports 50-336/82-18 and -20.

9. Inspector Witnessing of Surveillance Tests

The inspector witnessed the performance of surveillance testing of selected components to verify that: the surveillance test procedure was properly approved and in use; test instrumentation required by the procedure was calibrated and in use; technical specifications were satisfied prior to removal of the system from service; the test was performed by qualified personnel; the procedure was adequately detailed to assure performance of a satisfactory surveillance; and test results satisfied the procedural acceptance criteria or were properly dispositioned. The inspector witnessed the performance of:

Inspector Witnessing of Surveillance Tests (cont'd)

Unit 1

- Local Leak Rate Testing of Outboard Feedwater Check Valves (1-FW-9a & b) per SP 623.14, Revision 4 on September 20.
- Observation of In-Service Inspection (ISI) of Safety Related welds per ASME Boiler and Pressure Vessel Code Section XI*.

Unit 2

- "Spec 200 Safety Parameters Functional Test" per SP 2402P Revision 0 on September 8. (Channel B)
- "Service Water Pump 'C' (P5-C) Operational Readiness Test" per EN21104 Revision 1 with Change 2 on September 13.

* This activity began on September 23 and will continue, on a sampling basis, through the completion of the ISI program.

10. Plant Maintenance and Modifications

During the inspection period, the inspector frequently observed various maintenance and problem investigation activities. The inspector reviewed these activities to verify: compliance with regulatory requirements, including those stated in the Technical Specifications; compliance with the administrative and maintenance procedures; compliance with applicable codes and standards; required QA/QC involvement; proper use of safety tags; proper equipment alignment and use of jumpers; personnel qualifications; radiological controls for worker protection; fire protection; retest requirements; and, reportability as required by Technical Specifications. In a similar manner the implementation of design changes and modifications were reviewed. In addition to those items addressed above, the licensee's safety evaluation was reviewed. Compliance with requirements to update procedures and drawings were verified and post modification acceptance testing was evaluated. The following activities were included in this review:

Unit 1

- Modifications to Scram Discharge Volume in response to I&B Bulletin 80-17.*
- Repairs to containment isolation valve 1-SD-1.*
- Refurbishment of Main Circulating Water, Service Water, and Emergency Service Water pumps.*
- Refurbishment of Main Steam Isolation Valve 1-MS-1C.*
- Emergency Gas Turbine Generator overhaul.

Plant Maintenance and Modifications (cont'd)

*Inspection of these maintenance activities will continue into the following inspection period.

11. Site Modification - Solidified Radioactive Waste Storage Facility

The inspector reviewed the documentation for the safety analysis performed in support of the construction of a solidified radioactive waste storage building (PDCR 1-58-80).

The inspector found that the analysis addressed drainage, seismic design, security, types and quantity of wastes, container integrity, flood protection, fire protection and operation. Environmental, radiological, and civil safety evaluations were filed.

There were no unacceptable conditions identified.

12. Review of Radioactive Material Shipments - (Unit 1)

The inspector reviewed the activities concerning the shipment of radioactive waste to the Barnwell, S.C., burial site. Those activities included receipt inspections of the shipping cask and liner, solidification of material, radiation surveys and the completion of administrative and quality control requirements prior to shipment. These inspections concerned:

- Dewatered Resins (3.5 curies) from Unit 1 on September 2, 1982.
- Dewatered Resins (3 curies) from Unit 1 on September 10, 1982.

13. Exit Interview

At periodic intervals during the course of the inspection, meetings were held with senior facility management to discuss the inspection scope and findings.