U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-245/80-07
50-336/80-05

Docket No. 50-245
50-336

License No. DPR-21
DPR-65 Priority -- Category C

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: May 1 thru May 31, 1980

Inspectors: J. T. Shedlosky
J. T. Shedlosky, Sr. Resident Inspector — 6/13/80 date signed

J. T. Shedlosky for
R. P. Zimmerman, Resident Inspector — 6/13/80 date signed

_____ — _____ date signed

Approved by: R. C. Keimig
R. R. Keimig, Chief, Reactor Projects Section No. 1, RO&NS Branch — 6-18-80 date signed

Inspection Summary:

Inspection on May 1 thru May 31, 1980 (Combined Report Nos. 50-245/80-07 and 50-336/80-05)
Areas Inspected: Routine, onsite, regular and backshift inspection by two resident inspectors (47 hours Unit 1; 65 hours, Unit 2). Areas inspected included the control rooms and the accessible portions of the Unit 1 reactor, turbine, radioactive waste, gas turbine generator, and intake buildings; the Unit 2 primary containment, enclosure, auxiliary, turbine and intake buildings; and the condensate polishing facility; radiation protection; physical security; fire protection; plant operating records; surveillance testing; calibration; maintenance; core power distribution limits; and reporting to the NRC.
Results: No items of noncompliance were identified during this inspection.

Region I Form 12
(Rev. April 77)

DETAILS

1. Persons Contacted

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

J. M. Black, Superintendent, Unit 3
P. Callaghan, Unit 1 Maintenance Supervisor
F. Dacimo, Quality Services Supervisor
E. C. Farrell, Superintendent, Unit 2
J. Bangasser, Station Security Supervisor
H. Haynes, Unit 2 Instrumentation and Control Supervisor
R. Herbert, Superintendent, Unit 1
J. Kelly, Unit 2 Operations Supervisor
E. J. Mroczka, Superintendent, Plant Services
J. F. Opeka, Station Superintendent
V. Papadopoli, Quality Assurance Supervisor
R. Place, Unit 2 Maintenance Supervisor
P. Przekop, Unit 1 Engineering Supervisor
W. Romberg, Unit 1 Operations Supervisor
S. Scace, Unit 2 Engineering Supervisor
F. Teeple, Unit 1 Instrumentation and Control Supervisor

2. Review of Plant Operation - Plant Inspections

The inspector reviewed plant operations through direct inspection and observation of Units 1 and 2 throughout the reporting period. Activities in progress at Unit 1 included routine power operation and a plant shutdown on 5/31 to allow repairs to turbine extraction steam lines located in the condenser; at Unit 2, activities included routine power operation and a plant shutdown on 5/8 when design errors in service water system seismic pipe restraints were discovered by the plant Architect Engineer. The plant remained shutdown to correct this problem and upgrade other pipe restraints discovered to have calculated factors of safety less than two.

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. Annunciator Alarms

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 were 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.

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 all switchgear and motor control centers in accessible portions of the plant. Equipment conditions were found in conformance with Technical Specifications and operating requirements.

j. Plant Operations - Unit 1

During the week of May 11, a slight reduction in thermal efficiency became apparent as generator output dropped two to four megawatts. This loss of generation slowly increased to about ten megawatts. Problems were suspected with ninth stage turbine drains to the intermediate pressure feedwater heaters. Following testing extraction steam non-return valves at 1300 hours, 5/21, the plant experienced an uncontrolled loss of generation at a rate of 2 megawatts per minute. Thermal power was observed to increase as feedwater heating decreased. Reactor power was decreased to 88% with recirculation pump speed. An analysis of feedwater heater pressures and temperatures confirmed the failure of a flexible coupling bellows on the ninth stage turbine drain line which supplies extraction steam to the intermediate pressure feedwater heaters. That coupling is located in the condenser below the low pressure turbine. Because of possible high steam flow through the ninth stage turbine drains, reactor power was reduced to lower turbine power to 75% of rated power. The unit operated at 82% reactor power and 515MWe without incident until shutdown on 5/31.

A visual inspection revealed that two flexible couplings on both the A and B low pressure turbine ninth stage drain lines had failed. The impinging steam from these 24 inch lines damaged the bellows area on at least three additional flexible couplings. In addition, several plates which act as fairings around the extraction steam lines were torn loose. There was no observed damage to condenser tubes. Condensate water conductivity remained within specification during operation.

There were no unacceptable conditions identified.

k. Plant Operations - Unit 2

On 5/8 the licensee was informed by the Architect Engineer that an error had been discovered in pipe support designs of the service water system. During reviews required by NRC Bulletins 79-02 and 79-14, several supports on service water headers were found with factors of safety of less than two on hanger base plates. A pipe stress analysis run without taking credit for the subject hangers showed the potential for overstress conditions in the service water headers. With this information, the licensee considered both service water headers inoperable and commenced a reactor shutdown to cold shutdown (Mode 5) conditions.

The licensee's Architect Engineer determined that some pipe supports were designed to loads calculated by stress problems using the Operating Basis Seismic Event (OBE) instead of the Design Basis Seismic Event (DBE). Additionally similar errors were made in stress problems used on portions of main steam and safety injection piping.

The plant remained shutdown during the rest of this inspection period. Stress analysis to insure a minimum factor of safety of 2 for base plates was in progress. The inspectors observed anchor bolt testing and the rework of pipe supports which did not meet the minimum factor of safety. These supports which required modification were upgraded to exceed a final factor of safety of 4. The inspectors observed Anchor Bolt testing per QCI 79-02-1, "MP-2 Inspection of Cat 1 Pipe Supports, Base Plates and Anchor Bolts", Rev. 2, dated 11/13/79. The inspectors observed the construction practices during rework and modifications.

There were no unacceptable conditions identified.

1. Shutdown Margin - Unit 2

The reactor coolant system was drained to the centerline of the coolant hot leg to allow maintenance on reactor coolant pump seals.

The inspector verified that reactor coolant system boron concentration was maintained at values greater than that required by OP2207, Plant Cooldown, Revision 7, Change 2, dated 3/27/80 and OPS Form 2208-12, Shutdown Boron Concentration vs. Moderator Temperature, Revision 4, dated 5/23/79. This will insure that the Cold, Xenon free Cycle 3 Core will maintain a 3.2% shutdown margin with the maximum worth CEA stuck full out.

The most restrictive initial conditions for the boron dilution accident assume that the reactor coolant system is drained to the centerline of the coolant hot leg. To satisfy the assumption for a 15 minute maximum time for operators to recognize the situation and take action, a minimum shutdown margin of 2% is required. (Reference Licensee Event Report 50-336/80-05, dated 3/12/80.)

3. Review of Plant Operations - Logs and Records - Units 1 and 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	- 5/4 through 5/31
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; logs and records are maintained in accordance with Technical Specification and Administrative Control Procedure requirements.

Several entries in these logs were the subject of additional review and discussion with licensee personnel. No unacceptable conditions were identified.

4. Plant Maintenance

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 ascertain reportability as required by Technical Specifications. The following activities were included during this review.

Unit I

-- Control rod drive module 26-39 accumulator replacement.

-- Emergency condensate transfer pump flow testing with discharge orifice removed.

Unit II

-- Repair of pressurizer spray valve A.

-- Repair of steam generator feedwater regulating valve A actuator.

-- Replacement of Reactor Coolant Pump A and B seals.

-- Repair of Main Steam Isolation Valve B leakage through operating shaft bushing.

Unit II, cont'd.

-- Installation of automatic initiation logic to motor driven auxiliary feedwater pumps and regulating valves.

-- Inspection of Reactor Coolant Pump for casing gasket integrity.

-- Replacement of Main Steam Line Restraint 490002 and 490008 pipe saddle clamp bolts with those of material type ASME A-193, grade B7.

5. Licensee Event Reports (LER's)

The inspector reviewed the following LER's 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

79-08, Updated Report; The cause of gear casing failure of the Isolation Condenser Inboard Steam Supply Valve IC-1 has been updated following vendor analysis. The failure of the operator yoke sleeve flange was due to repeated excessive thrust loads. This resulted from excessive torque being applied by the operator. The licensee is planning to replace the valve operator motor and motor gearing to vendor recommendations. That will limit the excessive torque and thrust loads which have been experienced in the past.

Unit 2

80-17, Waste Gas Decay Tank discharge flow recorder declared inoperable during the discharge of the B-Waste Gas Decay Tank. The recorder was observed to be indicating an erratic flow rate; the gas discharge was terminated. The pin recorder clutch drive was cleaned, and the unit returned to service.

80-18, Both A and B service water supply headers declared inoperable when 9 of 73 hangers were found not to provide a factor of safety of at least two. The reactor was placed in cold shutdown (Mode 5).

80-19, Reactor coolant pressure less than that required for Power Operation (Mode 1) by Technical Specification 3.2.6, Table 3.2-1 for DNB Margin. The pressure fluctuation was the result of an overshoot in the pressure control system when an operator readjusted the RCS pressure control from 2260 psia to 2250 psia. Pressurizer spray valves opened and pressure ove shot the set point. Minimum pressure was 2207 psia; it remained below the specified 2225 psia for three minutes.

80-20, Reactor coolant pressure less than that required for Power Operation (Mode 1) by Technical Specification 3.2.6, Table 3.2-1 for DNB Margin. The pressure decrease was caused by the reactor coolant loop 1A pressurizer spray valve sticking open. A reactor trip on steam generator low level occurred during the load reduction following discovery of the stuck valve. Had the steam generator low level not occurred, a trip would have occurred on thermal margin low pressure. The valve stuck open due to a loose valve seat. This occurrence was not related to that reported in 80-19.

6. 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 5.6.1 were reviewed by the inspector. This review included the following consideration: 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 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 Reports - May, 1980 (Units 1 and 2)

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

The inspector reviewed the activities concerning the shipment of solidified 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:

--- Liquid waste solidification - 5/20

--- Resin slurry solidification - 5/7 - 9

8. Unmonitored Noble Gas Release Path (Unit 1)

On May 28, the licensee determined that a noble gas release occurred during periods of time that the Condensate Storage Tank was being filled. The condensate storage tank is vented directly to the atmosphere through an 8-inch vent on the top of the tank. Sampling the gas space in the tank near the vent resulted in finding Xenon 133 at 5E-5 microcuries per ml, Xenon 135 at 4E-4 microcuries per ml, and Xenon 135-m at 7E-6 microcuries per ml. A 4350 ml sample volume was used. The tank was being filled with low conductivity water at the time of sampling at 350 gpm for 165 min. This resulted in a calculated release of 10E+5 microcuries; assuming X/Q of 0.13E-4 site boundary concentrations were calculated to be Xe 133 at 1.5E-10 microcuries per ml, Xe 135 at 1.2E-9 microcuries per ml and Xe 135-m at 2E-12 microcuries per ml. The licensee is sampling the tank gas space daily and calculating the ground level release.

This item is considered to be unresolved (50-245/80-07-01) pending completion of the licensee's analysis of this release path including the accounting for ex-filtration losses from the tank when level is constant. The radioactive waste surge tank has a similar vent arrangement. That tank vent will be also sampled. The unit 2 refueling water storage tank has been sampled during filling after a refueling with negative results. This item will be addressed during future inspections.

9. 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.