

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

Region I

Report No. 50-245/81-08
50-336/81-07
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 17 thru July 11, 1981

Inspectors: J. T. Shedlosky 7/14/81
J. T. Shedlosky, Sr. Resident Inspector date signed
D. R. Lipinski 7-14-81
D. R. Lipinski, Resident Inspector date signed
J. Summers for 7/14/81
R. J. Summers, Reactor Inspector (June 17-25) date signed
Approved by: T. C. Elsasser 7/22/81
T. C. Elsasser, Chief date signed
Reactor Projects Section 1B,
Division of Resident & Project Inspection

Inspection Summary:

Inspection on May 17 thru July 11, 1981 (Combined Report Nos. 50-245/81-08 and 50-336/81-07).

Areas Inspected: Routine, onsite, regular and backshift inspection by two resident inspectors and a region based inspector (164 hours, Unit 1: 108 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 containment, enclosure, auxiliary, turbine and intake buildings; the condensate polishing facility; radiation protection; physical security; fire protection; plant operating records; modifications; Unit 1 fuel loading; surveillance testing; calibration; maintenance; core power distribution limits; and reporting to the NRC.

Results: Of the twelve areas inspected, one item of noncompliance was identified in one area: Exceeding 10 CFR 20 Appendix B, Table 2 limits for the concentrations of Iodine during a discharge to an unrestricted area, paragraph 3.

Region I Form 12
(Rev. April 77)

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DETAILS

1. Persons Contacted

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

A. Cheatham, Radiological Services Supervisor
J. Crockett, Unit 3 Superintendent
F. Dacimo, Quality Services Supervisor
E. C. Farrell, Station Services Superintendent
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

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

The inspector reviewed plant operations through direct inspection and observation of Units 1 and 2 throughout the reporting period. Activities in progress included the completion of a turbine repair outage at Unit 1. Following activities to balance the turbine, the generator was placed on the line on June 19. The plant remained at power for the remainder of the reporting period.

An outage at Unit 2 to allow the completion of surveillance testing of mechanical snubbers inside containment was completed on May 18. The unit remained on the line from May 19 through June 13 when the plant was shut down because the A and B charging pumps were considered inoperable. The generator was placed on the line on June 14 and remained at power for the remainder of the reporting period.

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 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.

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.

j. Unit 1

Repairs of the Unit 1 turbine were completed on June 12. The reactor was made critical at 0304 and turbine vibration testing and balancing was conducted on June 13 and 14. During a power reduction to hot standby on June 15, a Group One isolation and the following reactor scram occurred at a reactor pressure of 880 psig. The results of an investigation showed that although the reactor Mode Switch had been taken from Run to Startup, all contacts did not properly "detent". The low pressure isolation had not been bypassed. The reactor was made critical again at 1324, June 15, and turbine balancing continued until June 17. On June 17 and 18, the "E" Target Rack safety relief valve was cycled as part of a test program to verify torus response. The turbine generator was placed on the line at 0920, June 19, and the plant reached 100% thermal power at 1137 June 21. A loss of about 9% electrical generation was due to the removal of four L-1 turbine stages. Reactor power was reduced to less than 25% on July 5 and 6 to comply with the Technical Specification Surveillance requirements concerning monitoring APLHGR, LHCR and MCPR. A process computer failure resulted in the inability to perform these calculations.

k. Unit 2

Surveillance testing of mechanical snubbers in the Unit 2 containment was completed on May 17. The reactor was made critical and the generator placed on the line on May 18. However, a reactor Scram on Low Steam Generator level occurred on May 18. A second reactor startup occurred on May 19. The unit operated at full power until June 12 when two of three charging pumps were determined to be inoperable. A manufacturer's representative discovered that the licensee had mistakenly installed a suction flange for a flush connection on the discharge piping. The discharge piping flush connection flange was installed on the suction piping. As there was a difference between a 150 psi and a 1500 psi flange, the pumps were considered to be inoperable and the reactor shut down in accordance with the Technical Specifications action statement. The discharge piping flush connection flange was replaced with a pipe cap, and the reactor was returned to power operation on June 14.

3. Release of Unmonitored Radioactive Liquid to Unrestricted Areas - (Unit 1)

On June 21, the licensee determined that water overflowing from the turbine lubricating oil conditioner was contaminated with a mixture of fission and corrosion products. Its total activity was $3E-2$ microcuries per ml.

The lubricating oil system included a Bowser, Inc. Model 832 P-5 oil conditioner, which removes water and particulate contaminants. In addition to oil from the main turbine oil sump, the oil conditioner accepts drains from the oil sump vapor extractor and from several drip pans located beneath hydraulically actuated valves. As the lubricating oil system was considered to be uncontaminated, water removed from the oil was directed to the building drains.

Prompted by unusual quantities of water removed by the oil conditioner (approximately 4 gallons per hour versus no or very small amounts) on June 21, 1981, the licensee identified a discharge path from the main turbine bypass valve stems via seal leakage to the oil drip pans. The drip pans returned this flow to the Bowser oil conditioner. Water removed from oil is directed to an oil separator pit which underflows water to a storm drain while retaining waste oil. The unmonitored storm drain, in turn, discharges into Long Island Sound. Up to fifty gallons of liquid are estimated to have been discharged via this path prior to being detected.

Water recovered from the bottom of the oil separator was found at $6.3E-4$ microcuries per ml., and that in the storm drains $1.6E-4$ microcuries per ml. The effluent of the storm drains which flowed directly into Long Island Sound was found at $4.8E-6$ total activity. Two radionuclides were identified: Iodine-131 and -133 with concentrations of $5.4E-7$ and $4.2E-6$ respectively. These concentrations are greater than that permitted by 10 CFR 20.106 and 10 CFR 20 Appendix B, Table II for release to unrestricted areas.

This is identified as an item of noncompliance.

The licensee's actions included redirecting the water overflowing from the turbine oil conditioner to the radioactive waste system. When the source of the water was identified, the drip pan drain lines were redirected from the lubricating oil system to the radioactive waste system.

The oil separator and the storm drain catch basin were pumped down, cleaned and flushed. After the second flush of the storm drain system, activities were at MDA.

The inspectors sampled water in the storm drain catch basin, effluent from the storm drain, stagnant water near the storm drain out-fall and biota in the tidal margin. Six smears were taken in the storm drain pipe and on the rock out cropping at the out-fall.

These samples and smears were counted by Region I personnel. The liquid and biota were counted for one hour each. The calculated activity of $2E-7$ microcuries per ml. is less than MDA. Five of the six smears were counted for 10 minutes, one was counted for 20 minutes. The calculated activity of $3E-5$ microcuries per smear is less than MDA.

There were no additional unresolved items identified.

4. Auxiliary Feedwater Pump Turbine - Inadequate Lubrication - (Unit 2)

The turbine driven auxiliary feedwater pump was taken out of service on May 27 for an overhaul of the turbine. Inservice testing revealed a possible bearing problem. After discussions with manufacturer's representatives, failure was attributed to inadequate lubrication due to improper oil reservoir level.

Millstone Unit 2 is equipped with one (1) Terry Turbine type GS-2 (540HP) driven pump. Bearing lubrication is accomplished by oil ring pick-up from reservoirs at either end of the turbine. Each reservoir is fitted with sight glasses for oil level measurement. An unlabeled scribe line marks a level mid-way in the indicating range of the sight glass. This mark had been assumed to be "Normal operating level" during previous oil fills and level checks. Investigation revealed that the scribe mark indicates the minimum oil level reachable by the oil rings. It is possible that misinterpretation had resulted in operating the turbine without lubrication on this and earlier occasions of bearing failure. The turbine technical manual does not adequately describe the lubricating system or establish a minimum oil level. To insure proper oil level in the future, the licensee has rescribed the sight glass with a maximum level. The portion of the sight glass below the minimum level scribe mark has been blacked out. These actions are expected to aid in sight glass level interpretation.

This problem may be generic to other pressurized reactors using turbine driven auxiliary feed pumps and has been forwarded to the appropriate NRC office for additional evaluation.

There were no unacceptable conditions identified.

5. 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	- 5/12 through 7/11/81
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

Review of Plant Operations - Logs and Records - (Units 1 and 2) (cont'd.)

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 reveal no violations of Technical Specification or reporting requirements; and logs and records are maintained in accordance with Technical Specification and Administrative Control Procedure requirements.

No items of noncompliance were identified.

6. 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 ascertain 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

- Re-adjustment of MSIV limit switches for RPS input and indication.
- Modification of turbine lubricating oil leak collection drip pans to prevent the continued contamination of the lube oil system with reactor coolant.

Unit 2

- Repair of Turbine Driven Auxiliary Feedwater pump bearings.
- Replacement of pipe flange on discharge of A and B charging pumps with rated pipe caps.
- Repair and rewiring of RPS RTD terminals.

7. 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

- 81-09, Set point drift, one of four main steam line radiation monitors.
- 81-10, Set point drift, three of four LPCI break detection logic differential pressure switches.
- 81-12, Set point drift, isolation condenser initiation time delay relay.
- 81-13, Standby Gas Treatment System "A" - out of service due to filter clogging.

Information Report, Unexpected increase in Source Range Monitor Count rate

Unit 2

- 81-18, Report of the results of testing mechanical snubbers.
- 81-19, Turbine driven auxiliary feedwater pump out of service due to bearing failure.
- 81-20, Discovery that pressurizer safety valve inlet piping had been undersized. The system had been analyzed for a flow with a 2.5 inch inside diameter supply spool piece. Schedule 160 pipe with a 2.125 inch inside diameter was installed.
- 81-21, Two of three charging pumps declared inoperable when it was discovered that suction and discharge flush connection blank flanges were incorrectly installed on both pumps.
- 81-22, Through the wall crack in safety injection test header piping located in containment.

- 81-23, Through the wall leak in service water piping at the "C" Service Water Pump discharge.
- 81-24, One of two emergency diesel generators declared inoperable due to the failure of a service water valve to open.

Environmental

- ETS 81-01, Second quarter sample of oysters from within 500 feet of discharge found with levels of Silver-110m and Cobalt-60 exceeding the average activity of the control station by greater than a factor of ten.
- ETS 81-02, Unmonitored release of liquid waste effluents was identified. Water overflowing the turbine lubricating oil conditioner entered the storm drain system that discharged to Long Island Sound.

8. 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; testing 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:

Unit 1

- APRM Calibration per SP404-C Revision 1, on June 30.
- RBM Calibration per SP410-C Revision 3, on June 30.

9. 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 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 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:

Review of Periodic and Special Reports (cont'd)

- Monthly Operating Reports Unit 1 and 2, April 1981.
- Monthly Operating Reports Unit 1 and 2, May 1981.
- Monthly Operating Reports Unit 1 and 2, June 1981.

There were no unacceptable conditions identified.

10. Verification of TMI - Task Action Plan Requirements (Units 1 and 2)

The inspector reviewed the licensee's responses and the implementation of commitments made to satisfy the below listed Task Action Plan requirements. Those requirements are stated in NUREG-0737, Clarification of TMI Action Plan Requirements. The licensee's responses to these and other requirements are contained in a December 31, 1980 letter.

I.C.6 Verification of Correct Performance of Operating Procedures

The licensee has stated his disagreement concerning the need to have a second qualified operator verify system valve alignments. The licensee's position is that generally senior licensed personnel are those with the authority to release systems and equipment for maintenance and testing and authorize the return to service. Also the job supervisor verifies the correct implementation of equipment control measures such as tagging.

Unit 1 personnel perform a weekly verification of system flow path.

Unit 2 specifies that different operators perform the independent verification of redundant subsystems.

This does not agree with the NRC position stated in NUREG-0737. The inspector verified that the licensee had taken the action stated in the December 31, 1980 letter.

I.E.4.2 Containment Isolation Dependability

Pressure Set Point -

Unit 1 - The licensee's position is consistent with the BWR Owners Group. The present containment pressure setpoint of less than or equal to 2 psig is the minimum value compatible with plant operation. No further action is planned.

Modifications

Units 1 and 2 - It is the licensee's position that no modifications are required. (Ref: Letter W.G. Council to D.G. Eisenhut dated July 1, 1981)

Containment Purge Valves

Unit 1 - It is the licensee's position that no additional restrictions on valve operation need be implemented.

Unit 2 - The 42 inch purge valves are locked closed during operational modes per the requirements of Amendment 61 to the operating license. The 6 inch vent valves isolate on high containment pressure or low pressurizer pressure. It is the licensee's position that no additional modifications need be implemented.

Radiation Signal on Purge Valves

Units 1 and 2 - It is the licensee's position that no additional modifications are required.

II.K.3.14 Isolation of Isolation Condenser on High Radiation - Unit 1

There is no automatic isolation of the Isolation Condenser on High Radiation in the steam supply or vent lines. There is a gross gamma detector on the vent line. This monitor is for indication only. It is the licensee's position that the implementation of an automatic isolation system is not required.

II.K.3.27 Common Water Level Reference - Unit 1

The licensee intends to establish a common water level reference of 482.5 inches above the bottom of the reactor vessel. A technical specification change will be submitted by August 1, 1981. Modifications to implement this change will be completed by October 1, 1981, or one month after NRC approval, whichever is later (Ref: Letter, W.G. Council to D.G. Eisenhut, dated June 30, 1981).

III.D.3.3 Improved In Plant Iodine Instrumentation - Units 1 and 2

Continuous air monitors with direct readout and alarm of the iodine cartridge have been located in the Unit 1 and 2 control rooms. Silver-loaded silica gel cartridges are available for use in these monitors.

Additional monitors are available for the Technical Support Center and Emergency Operations Center.

Onsite emergency team kits have been supplied with portable air samplers, silver-loaded silica gel cartridges and gross beta-gamma detectors and scalars.

The ability exists to obtain air samples from any accessible area in the plant and count them in a low background area. The silver-loaded silica gel cartridges will prevent noble gas saturation. (Reference NUSCO letters dated December 7, 1979, January 31, 1980 and December 31, 1980 and NRC Inspection Report 50-245/80-18, 50-336/80-20).

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

The inspector reviewed the activities concerning the shipment of radioactive waste to the Barnwell, SC 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:

--- Solidified Concentrates July 7 and July 8, 1981.

12. 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.