

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket/Report: 50-443/91-01

License No: NPF-86

Licensee: Public Service Company of New Hampshire, New Hampshire Yankee
(NHY) Division

Facility: Seabrook Station, Seabrook, New Hampshire

Dates: January 4 to February 7, 1991

Inspectors: N. Dudley, Senior Resident Inspector
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Approved By: Ebe C. McCabe
Ebe C. McCabe, Chief, Reactor Projects Section 3B

2/14/91
Date

SCOPE

Resident inspection of plant operations, radiation protection, surveillance/maintenance, security, engineering/technical support, and safety assessment/quality verification.

OVERVIEW

Operations: The reactor was operated in a safe, conservative manner. Minor difficulties with freeze protection, and inconsistencies in labeling of fire doors and electrical equipment, were noted.

Radiological Controls: Good control of work in the containment was noted.

Maintenance/Surveillance: Control of work and responses to conditions were in accordance with procedures.

Security: Responses to adverse weather and hypothesized potential terrorist acts were good.

Engineering/Technical Support: Modifications were properly implemented and controlled to reduce personnel exposure and prepare for the upcoming refueling outage.

Safety Assessment/Quality Verification: Documentation of inspections of pipe supports was found acceptable. Nuclear Quality Group (NQG) monitoring of Technical Specification requirements was found adequate.

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DETAILS

1.0 SUMMARY OF ACTIVITIES

Two resident inspectors were assigned. The inspection hours included 16 backshift hours, of which 8 were deep backshift hours.

An NRC maintenance team inspection was conducted between January 28 and February 8. The results will be documented in Inspection Report 50-443/91-80.

The plant remained at 100% power throughout the inspection period.

2.0 OPERATIONS

2.1 Plant Tours

The inspector conducted daily control room tours which included reviews of operator log books, Technical Specification action statement tracking logs, tagout logs, and night orders. Assessments were made of Technical Specification action statements in effect, control room staffing, management oversight, operator awareness of plant conditions, and operator response to alarm conditions. No unacceptable conditions were noted.

The inspector conducted plant tours which included inspections of equipment, structures and housekeeping. Problems identified are discussed in this report. Minor discrepancies were turned over to the licensee and resolved.

2.2 Plant Events

On January 2, 1991, an insulator failed on the Newington offsite transmission line. The line was restored to service on January 12 after insulator replacement. Technical Specification requirements for offsite power availability were met by operability of the other two sources.

On January 12, steam dump valves were opened for approximately six hours due to problems encountered during main turbine control valve testing. In association with the cycling of control valves, primary temperature was allowed to increase so that the power reduction required to complete the valve testing could be minimized. During the cycling of Control Valve No. 1, the electrohydraulic control (EHC) system excess throttle pressure setpoint was reached and Control valves 2 and 3 did not throttle open. As a result, primary temperature increased, causing the steam dump system to arm and one set of steam dump valves to open to control primary temperature. The excess throttle pressure setpoint was raised and control valve testing was completed without further problems. The valve testing procedure was revised to require verification of the excess throttle pressure setpoint prior to cycling the control valves. Pending determination of the adequacy of the controls over the excess throttle pressure setpoint changes, this matter is unresolved (91-01-01).

On January 16, maintenance on the Main Control Room (MCR) east air intake radiation monitor resulted in loss of MCR indication for Alternate Containment Gas Backup Radiation Monitor RM-R-6548. Since Containment Recirculation Gas and Particulate Monitors RM-R-6526-1 and 2 were out of service, the Technical Specification 3.4.6.1, "Leak Detection Systems," limiting condition for operation (LCO) was entered, requiring the plant to be placed in Operational Mode 3, Hot Standby, in six hours. In addition, the shift superintendent entered Technical Specification 3.0.3, which required that a shutdown be initiated within one hour. Within twenty minutes, MCR indication for RM-R-6548 was restored and the Technical Specification action statements were exited.

The Operations, Licensing and Maintenance Departments reviewed the incident. The licensing staff determined that, since the LCO for Technical Specification 3.4.6.1 was not exceeded, Technical Specification 3.0.3 was not required to be entered and that the event was not reportable. The maintenance staff revised eight maintenance procedures for radiation monitors so that local breakers are used to remove power from the detectors and loss of MCR indication for other radiation monitors is prevented.

The operators established plant conditions and performed tagouts to allow maintenance on equipment including steam generator blowdown lines, the Diesel Generator "B" air compressor, non-vital Inverter UPS-I-2A, and the water treatment system.

The inspector concluded that: plant operations were conducted in a safe and conservative manner, stable conditions were maintained, and operator responses were good.

2.3 Engineered Safety Feature System Walkdown

The inspector verified the position of breakers for the residual heat removal (RHR) motor operator valve indication and control power. All breakers were in the position required by Procedures OS1013.03 and OS1013.04 "Residual Heat Removal Train Startup and Operation," and motor-operated valve and breaker positions met the requirements of Technical Specification 3.5.2, "ECCS Subsystems - Tave Greater Than or Equal to 350 F."

The inspector noted that the nomenclature for local breaker labels, system lineup checklists, and engineering drawings were inconsistent. A program is in progress to review the labeling, resolve the differences in nomenclature by the end of 1991, and subsequently revise procedures, drawings, or labels as appropriate. The inspector concluded that the breaker lineup for RHR motor-operated valves was proper and that a program was in place to better assure consistency between breaker lineup checklists and breaker labeling.

2.4 Fire Doors

The inspector noted that a door stenciled as a "fire door" was propped open in the waste processing building. The fire fighters were unaware the door was impaired but were able to determine that the door was not a fire barrier and did not require any compensatory action. A

fire watch did pass by the door hourly as part of an unrelated compensatory watch. The inspector discussed the situation with the Fire Fighting Supervisor and the Fire Protection Engineer and determined that impaired fire doors which are not included in the Technical Requirements were not routinely reported to or reviewed by the fire fighters.

Request for Engineering Services RES-90-0548, approved October 15, 1990, states: 10CFR50, Appendix A, Fire Doors are a license commitment of the station and should be operational at all times. If the doors are out of service, compensatory action should be taken." Revision 1 to the RES, approved December 17, 1990, states that there are no license-required compensatory actions for Appendix "A" fire doors, however, the requirements for disabling the doors is established in the Station Fire Protection Manual (SSFP) in Chapter 2, Procedure 2.3, "Fire Protection Equipment Operation and Disablement." Procedure 2.3 requires that "planned disablement...shall be controlled by a work request."

The maintenance staff was verbally instructed on the content of SSFP Procedure 2.3 and a memorandum issued by the maintenance manager on February 1, 1991 delineated management's expectation for the implementation of the procedure requirements. In addition, the Plant Manager highlighted the requirement for reporting impaired fire doors to the main control room in a written message to the plant staff.

A design basis document for Fire Rated Doors and Dampers, DBD-FP-06, issued on January 14, 1991, identified fire doors as being covered by 10CFR50 Appendix R, 10CFR50 Appendix A, or other requirements. The inspector determined by plant tours that Appendix R doors were clearly stenciled "Fire Door Technical Requirements," that some Appendix A doors were stenciled "Fire Door," and that other doors were inconsistently stenciled.

New Hampshire Yankee plans to use the design basis document to define each fire door by number and functional requirements. Stenciling of the doors by number and function is planned to begin after a consistent nomenclature has been approved. Stenciling of Appendix R and Appendix A doors is expected to be completed before August 30, 1991 with the remainder of the doors stenciled by January 1992.

No actual improper fire door positioning was identified. The inspector found the licensee's interim controls and corrective actions acceptable.

2.5 Cold Weather Preparations

During January, cold weather resulted in freezing of a fire deluge system drain valve in the turbine building, freezing of the pressure control sensing line to Auxiliary Steam Heating System Supply Valve AS-PCV-9213 to the waste handling building, increasing the differential pressure across the primary auxiliary building inlet ventilation screens, freezing of the demineralized water storage tank (DWST) level indicator line, and freezing of several main steam drain lines. The fire deluge system drain valve split and was replaced. The freezing of the DWST level indicator line and AS-PCV-9213 was caused by lagging gaps, which were repaired. A temporary

modification was completed to heat trace each main steam drain line separately instead of heat tracing all lines in series. A review of the turbine building ventilation lineup for cold weather conditions was initiated.

The inspector reviewed the Freeze Protection Problem log, which was initiated in January 1988. The components which experienced freezing in January 1991 had freezing problems previously, but the inspector determined the causes were not similar. Operations and technical support personnel conducted walkdowns of the facility to identify the causes of the freezing problems and to identify and eliminate other potential problems. The inspector concluded that appropriate concern and consciousness for freeze protection was exhibited, albeit after the occurrence of several weather related problems. The freezing problems did not significantly affect safety, and the inspector had no further questions.

2.6 Reactor Trip Due to Loss of Voltage on EHC 24 Volt DC Bus - LER 90-022 (Closed)

On August 22, 1990, the reactor tripped from 100% power as a result of troubleshooting on the electrohydraulic control (EHC) Early Valve Actuation (EVA) circuitry. New Hampshire Yankee was unable to reproduce the actuation signal or identify the root cause. The K-3 relay board associated with the EVA logic board was replaced. An EHC vendor representative reviewed the troubleshooting and monitored EHC system performance during the subsequent plant startup. In addition, the LER stated that a design change to install an electronic circuit which would eliminate the effects of pressure pulses on the steam generator level trip signal was scheduled for completion prior to restart following the first refueling outage.

The inspector reviewed the Station Incident Report, which included the post-trip review and root cause analysis, and concluded that a good evaluation had been conducted. The inspector noted that, on several occasions, Shift Supervisors carefully evaluated EHC maintenance and only allowed performance of activities after assessing the risk of a trip. This item is closed.

2.7 Reactor Trip Due to Steam Generator Low-Low Level Signal - LER 90-025 (Closed)

On November 9, 1990 a reactor trip occurred from 100% power. The cause of the trip was fatigue failure of an instrument air booster relay to the actuator for a feedwater control valve. The failure resulted in the feedwater control valve shutting, causing steam generator water level to decrease and generating a reactor trip.

The installation of a design change which relocated booster relays on all feedwater control valves was evaluated in NRC Inspection Report 50-443/90-23. No discrepancies were noted. This item is closed.

3.0 RADIOLOGICAL CONTROLS

3.1 Reactor Coolant Pump Modification

The inspector observed radiological control activities associated with the installation of a temporary modification on the 'A' Reactor Coolant Pump, including attending the pre-job briefing and observing work in progress in the field. A post-job review was conducted, even though the total exposure was less than that which the procedure specifies as requiring a post-job review. Dose estimates for the job were based upon estimated times for the work and a survey of the area in which the work was to be performed. Multiple sets of dosimetry were specified to monitor head, chest, back, arms and legs due to the gradient of the radiation field in the work area. Temporary shielding was utilized to reduce the dose received from short-lived fission products traveling through the RCS piping connected to the pump. Prior to commencing work, a check was performed to ensure that radiological conditions had not changed appreciably from those of the survey. Health Physics technicians monitored the self-reading dosimeters on the side of the workers' bodies in the highest radiation field. In addition, the H-P Technicians repeatedly surveyed the immediate vicinity of the mechanics and advised them of actions to take to minimize radiation dose. The actual work time exceeded the estimates by a substantial margin (factor of 4 or 5). However, due to aggressive H-P coverage, the total accumulated dose was only about double the estimate.

The inspector concluded that the planning, implementation, and post-job review of the as low as reasonable achievable (ALARA) aspects of the temporary modification were excellent.

3.2 Noncompliance with TS - Unsecured High Radiation Area - LER 90-020 and 90-023 (Closed)

On August 1 and again on September 7, 1990, the licensee discovered that a door to a locked high radiation area was open. A violation was issued. For administrative purposes, Licensee Event Reports (LERs) 90-020 and 90-023 are closed and corrective actions will be evaluated in conjunction with Open Item 50-443/90-18-02.

4.0 MAINTENANCE/SURVEILLANCE

Work Request 90W005700 for repair of Service Air Isolation Valve SA-V-92 was reviewed. Portions of the maintenance were observed. The valve seat and disk were machined and lapped, the valve stem was modified to allow coupling to new actuator, packing was adjusted, and the internals of the new actuator were lubricated. Then, the valve did not meet stroke time requirements because of faulty operation of the new actuator. The old actuator was rebuilt and reinstalled. Valve retest was satisfactory.

The inspector determined that the work request clearly documented the work and the approvals of scope changes. The inspector noted that the maintenance technicians from the I&C and mechanical departments worked well together and routinely consulted with system engineers.

No deficiencies were noted in the field work. The system engineer noted that the new actuator should have been bench tested before installation and that inaccurate drawings were supplied by the vendor. The inspector concluded that the maintenance work was well controlled, performed, and documented.

The inspector observed testing of Station Battery EDE-B-1C under MX0506.04, "Station Battery Service Test." Cell-to-cell connection resistance readings were well below the allowable maximum. Thermographic monitoring equipment was on-hand for identifying any 'hot-spots' during the discharge test. During the discharge test, problems were experienced with the electronic control unit. Testing was suspended to permit troubleshooting and repair of the controller. The discharge test was subsequently completed with all acceptance criteria being met.

No unacceptable conditions were identified.

5.6 SECURITY

The inspector inspected the Secondary Alarm Station to evaluate the adequacy of monitoring equipment after a major snow storm. All security fences were cleared of snow with the exception of the fence north of the cooling tower, where snow removal was in progress. The inspector determined that actions taken to maintain and survey security barriers in response to the snow storm were good.

The inspector discussed with the security manager the increased security precautions taken in response to a hypothesized security threat increase and observed the implementation of the precautions. The inspector concluded that the licensee's measures were thorough and appropriate.

6.0 TECHNICAL SUPPORT

6.1 Temporary Modification on 'A' Reactor Coolant Pump (RCP)

Temporary Modification (TMOD) 90TMOD0058 was initiated to reduce the radiological dose associated with refilling the 'A' Reactor Cooling Pump lower bearing housing oil reservoir after a small oil leak developed on the lower bearing oil seal. Oil was being added to the reservoir every week to ten days. The time necessary to remove and reinstall the splash-guard resulted in radiological doses. The TMOD was generated in order to reduce the dose and consisted of extension of the fill connection to a low dose rate area.

The inspector reviewed the work request and TMOD packages and observed portions of the work in the field. The TMOD package addressed the reason for the modification (dose reduction), the material needed, and the methodology to be used. The engineering evaluation for the modification included consideration of seismic qualification of the Reactor Coolant Pump motor, fire loading of containment, and margins in the design of the oil collection system. The engineer who worked out the modification advised and assisted with the field installation. The inspector

determined that the modification was well thought out and received appropriate review by independent parties. During a subsequent containment entry to add oil to the 'A' RCP, a reduction in total dose by a factor of about 10 was observed (~40 mrem, as opposed to ~400 mrem previously), indicating the desired goal was achieved. No unacceptable conditions were identified.

6.2 Alternate Fuel Pool Cooling

In order to support the outage of the Primary Component Cooling Water (PCCW) Systems during the first refueling outage, an alternate means of cooling the spent fuel pool is being installed. The work is being performed under DCR 90-042 and will add a third fuel pool cooling heat exchanger, which is to be cooled by a medium other than PCCW. The design calls for the primary cooling source to be a portable, skid-mounted cooling tower. Backup sources of cooling water come from the Ultimate Heat Sink Cooling Tower and the Service Water system.

The inspector reviewed DCR 90-042 and determined that appropriate design bases were used. The heat exchanger is a retagged Unit 2 component, the piping is being fabricated and installed as ASME III, Safety Class 3 piping. Supports for the piping and heat exchanger are designed to accommodate seismic loading, and connections to permanent plant systems will be made using removable spool pieces. Appropriate reviews were performed, and the safety analysis performed appeared to adequately address the issues surrounding the change. New Hampshire Yankee (NHY) design personnel inspected the field installation of the heat exchanger supports to evaluate and resolve minor dimensional discrepancies. The installation is being performed by UE&C contract personnel with NHY Quality Control coverage.

7.0 SAFETY ASSESSMENT/QUALITY VERIFICATION

7.1 Main Steam Piping Supports

Employees Legal Project (ELP) File Number 301-89-004 (QTC report, Appendix H, Pages 241 and 253) states that "some gussets in main steam feed restraints were not QC inspected when the job was finished" and specifies concerns with cracked welds. The inspector examined welds on six supports for the main steam lines in the East Pipe Chase (4001 and 4002 Series) in January 1990. Weld quality was found to be acceptable, as documented in NRC Region I Inspection Report 50-443/90-80. However, the inspection report did not address QC inspection of the welds. The New Hampshire Yankee response to the QTC report, dated January 24, 1990, states that some welds had been rejected for lack of fusion or evidence of cracking. The fact that some welds were rejected indicates that there was inspection of welds.

The inspector selected four restraints, at random, from the six inspected, and reviewed Pullman-Higgins documentation relating to welding thereon. Documents reviewed included field weld process sheets with QC holdpoints clearly marked and signed off. Weld/Base Metal Defect Surveillance Reports, Magnetic particle Examination Records, Support Rework Orders,

Dimensional Inspection Reports, Field Process Sheets, and Installation As-Built Verifications. The inspector concluded that there was sufficient evidence that appropriate QC inspections were performed, and had no further questions.

7.2 Painted Welds for Dome Supports

ELP File Number 110-87-004 (QTC report, Appendix H, page 181) states that supports in the top of the Unit 1 dome were spray painted before final acceptance and that it was impossible to see potential problems with the welds. This issue was reviewed in NRC Inspection Report 50-443/90-80. The licensee had issued Inspection Procedure IX-87 for inspection of painted weld joints based on the completion of in-process inspections of the welds. NRC review found the procedure acceptable for its intended use.

Recently, the resident inspector reviewed associated completed visual weld inspections and the qualifications of one of the Pullman Level II inspectors. Four welds were randomly selected. Based on the visual inspection, Nonconformance Reports (NCRs) had been written for three of the welds. These NCRs were properly dispositioned under the licensee's program. The Level II inspector was qualified to conduct inspections for Procedure JS-IX-6, "Installation and Inspection of ASME III Pipe Supports." Procedure IX-87 was written specifically for the painted dome supports and specified five attributes to inspect using JS-IX-6 acceptance criteria. The inspector concluded that the Level II inspector was qualified to conduct the inspection, that potential problems with painted, dome support welds had been adequately identified by qualified Level II inspectors, and had no further questions.

7.3 Technical Specification Section 6.0 Requirements

The inspector held discussions with the Nuclear Quality Group (NQG) to determine how the organization verified compliance with Technical Specification Section 6.0, "Administrative Requirements." In addition, the inspector reviewed completed surveillances and audits including:

QASAR 90-00801	Shift Relief, Turnover and Composition
QASAR 91-00021	Control Room Conduct and Housekeeping
QASAR 91-00022	Operations Shift Routine
Audit Report No.90-A11-01	Conformance to Operational Technical Specifications
Audit Report No.90-A05-01	Conformance to Operational Technical Specifications

The NQG maintains a database which establishes a one-to-one correspondence between Technical Specification Sections 3.0 and 4.0 requirements and surveillances, technical appraisals, or audits performed by the NQG and the Technical Support Group. However, the database does not include all Section 6.0 requirements. The surveillance and audit programs generally review compliance with Section 6.0 requirements by evaluating Station Operation Review Committee and Nuclear Safety Audit Review Committee activities.

The inspector noted that the NQG has not verified that a comprehensive review of all Section 6.0 requirements has been conducted. NQG plans to complete a review of Section 6.0 requirements and develop a matrix which identifies which NQG audits or surveillances evaluate compliance with each requirement. The inspector had no further questions.

8.0 MEETINGS

The scope and finding of the inspection were discussed periodically throughout the inspection period. An oral summary of the preliminary inspection findings were provided to the plant manager and his staff at the conclusion of the inspection.

A public management meeting was held at the Seabrook Nature and Science Center, Seabrook, New Hampshire on January 9, 1990. At the meeting, the NRC presented a summary of the information contained in the Systematic Assessment of Licensee Performance (SALP) between July 1, 1989 and October 31, 1990, and New Hampshire Yankee presented responses to the assessments. The final SALP report was issued as NRC inspection report 50-443/89-99.

A region-based inspector conducted the following exit meeting.

<u>DATE</u>	<u>SUBJECT</u>	<u>REPORT NO.</u>	<u>INSPECTOR</u>
2-8	MTI	91-80	DRYSDALE