U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket/Report No.: 50-443/92-11 **License No.:** NPF-86

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

Facility: Seabrook Station, Seabrook, New Hampshire

Dates: May 12 - June 15, 1992

Inspectors: N. Dudley, Senior Resident Inspector, Operations
S. Wookey, Resident Inspector

Approved By: _____ 7/1/92
William J. Lazarus, Chief, Reactor Projects Section 3B Date

OVERVIEW

The Operations Department operated the plant safely and responded well to minor operational events. Station personnel conducted radiological, maintenance, surveillance and security activities in a controlled manner. The Emergency Preparedness Department planned and conducted a full-participation emergency exercise that was evaluated by the NRC. The inspector noted that the review and evaluation of minor operational events provided effective self-assessment.

The Engineering Department documented the engineering basis for modifying previous NRC commitments. The inspector reviewed the engineering and licensing issues involving a ground strap in the electrical transmission yard that is suspended above the three off-site power lines and responded well to NRC identified discrepancies on a piping and instrumentation drawing.

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DETAILS

1.0 SUMMARY OF ACTIVITIES

1.1 NRC Activities

Two resident inspectors were assigned. The inspectors conducted backshift inspections on May 13, 19, and June 4; and deep backshift inspections on May 17, 25, and June 6.

On June 4, an NRC inspection team evaluated the on-site performance of the emergency response organization during a graded emergency exercise. The results of the evaluation will be documented in NRC Inspection Report No. 50-443/92-10.

On June 8, the Acting Director, Project Directorate I-3 from the Office of Nuclear Reactor Regulation, and the Director, Branch Chief, and Section Chief from the Division of Reactor Projects, Region I, presented the results of the Systematic Assessment of Licensee Performance to New Hampshire Yankee Senior Managers at the Seabrook Station Science and Nature Center.

1.2 Plant Activity

The plant operated at 100% power. The first shipment of new fuel for the second refueling outage arrived on June 10.

2.0 OPERATION

2.1 Plant Tours [71707]

The inspectors conducted daily control room tours, observed shift turnovers, and attended plan-of-the-day meetings. The inspectors reviewed plant staffing, safety tag orders, safety system valve lineups, and compliance with Technical Specifications. Tours were conducted of safety related equipment, the turbine building, the waste handling building, the circulating water pump house, and the pipe chases. No discrepancies were noted.

On May 16, following control valve testing, power decreased 120 MWe when control valve number six closed from 15% open to 8% open. Approximately two hours after power was restored, a second power decrease occurred due to partial closure of the same control valve. After the second occurrence, the control room operator increased the load set to 4% above the load limit.

The Technical Support staff review of the events determined that the cause of the power decreases was the close matching of the load set and load limit. The control valve was driven closed by increases in header pressure and grid voltage providing input signals to the valve control logic circuit. The excess throttle pressure signal compounded the condition by driving the control valve shut to reduce steam header pressure. The Technical Support engineers provided

training to operators on the details of the event. The engineers presented suggestions for positioning the load set and load limit during valve testing and discussed future modifications to display the load set and load limit voltages on the main control board.

On May 26, thermal barrier cooling water (TBCW) pump B tripped. The operators verified TBCW pump A automatically started. The Shift Superintendent entered Technical Specification 3.8.4.2, "Containment Penetration Conductor Overcurrent Protective Devices," until the breaker was opened. Troubleshooting efforts determined that the thermal overloads on the pump breaker were faulty and electricians completed repairs. The pump was returned to service the same day.

On May 30, during turbine valve testing, the third condensate pump started on low main feedwater pump suction pressure. The Technical Support system engineer attributed the start of the condensate pump to a lower initial main feedwater pump suction pressure resulting from degradation in condensate and heater drain pumps. Technical Support engineers monitored subsequent turbine valve testing and suggested techniques for preventing the automatic condensate pump start. On June 13, the technique of waiting fifteen minutes between each valve test was successful in preventing an automatic start of the third condensate pump.

On June 10, a relief valve failed on feedwater heater 26B. A third condensate pump automatically started due to the fluctuation in the main feedwater pump suction pressure. The auxiliary operators isolated the feedwater heater. The relief valve was replaced and the operators restored the feedwater system lineup to normal.

On June 12, the smoke detector on the east air intake for the control building air handling (CBA) system alarmed. The operators manually actuated the engineered safety features system to place the CBA system in the filtered recirculation mode as required by procedures. The operators determined the alarm was spurious and restored the CBA system to normal.

The inspector concluded that operations personnel responded well to minor operational events and appropriately requested assistance from the Technical Support Department.

2.2 Engineered Safety Feature System Walkdown [71710]

The inspector conducted a walkdown of support systems to diesel generator B using controlled Piping and Instrumentation Drawings (P&ID). Systems compared to the P&IDs included fuel oil, cooling water, engine exhaust, starting air, and lube oil. The inspector discussed identified discrepancies with Operations and Engineering personnel.

The Engineering Department reviewed an NRC identified discrepancy in the representation of cooling water expansion tank level sight glass valves on P&ID 1-DG-B20466 and determined that the code breaks were incorrectly shown. Engineering Design Change (ECA) 052067A deleted

the original instrument root valves from the design in November 1982. However, in February 1984 ECA 020902A labeled the unqualified instrument valves integral to the sight glass as the root valves. As a result, the P&ID showed unqualified valves as providing the isolation boundary for an ASME Class III piping system.

The Engineering Department in coordination with the diesel generator manufacturer, Coltec Industries, determined the failure of the sight glass would not degrade the ability of the diesel generator to perform its emergency function. The determination was based on the cooling water expansion tank being located thirty feet above the cooling water pump and the existence of an expansion tank low level alarm which would notify operators of a leak. The supply piping from the expansion tank provided sufficient net positive suction head for cooling water pump operations. The Engineering Department was evaluating the sight glass design. Engineers informed Operations personnel and Technical Support engineers of the unqualified cooling water expansion tank sight glass and the continued operability of the diesel generator.

An independent walkdown by an engineer of the skid mounted equipment associated with the diesel generator cooling water system verified that NRC identified deficiencies existed on P&ID 1-DG-B20466. The skid mounted equipment portion of the cooling water system was identified on the P&ID and was derived from a vendor supplied print. Even though the P&ID was field verified in 1984, the deficiencies were not detected. The inspector agreed that the errors on the P&ID did not affect system operability. The Engineering Department planned to conduct a walkdown of all skid mounted support systems on one diesel generator prior to the end of the second refueling outage and correct identified errors.

The inspector noted that two metal hose connectors in the cooling water system were mislabeled and that caps were not installed on two drain lines on the diesel exhaust line. The Operations personnel initiated a Work Request to correct the labels. Engineering personnel initiated a review of vent and drain caps throughout the plant in order to develop a program for controlling pipe caps.

The inspector concluded that an installation deficiency in, and P&ID errors for a diesel generator support system, did not affect the operability of the diesel generator and were being adequately addressed by the Engineering Department.

3.0 RADIOLOGICAL CONTROLS [71707]

The inspector toured the radiologically controlled areas, reviewed the local radiation and contamination control postings, and observed the source check and calibration status of local equipment. Instruments were properly calibrated and locked doors were secure. The inspector observed smears being taken in the non-radiologically controlled area as part of routine surveillance. Health physics personnel at the control point were knowledgeable of the status and location of temporary radiation monitoring equipment. No deficiencies were noted.

4.0 MAINTENANCE/SURVEILLANCE

4.1 Maintenance [62703]

As described in NRC Inspection Report No. 50-443/92-03, fuel oil drainage from the emergency diesel generator engine cylinders caused the particulate levels in a fuel oil bulk storage tank to exceed the Technical Specification requirements. A system modification was initiated to install a dirty fuel oil collection reservoir on each diesel generator. The reservoirs will be manually drained and the dirty oil will be discarded. The reservoirs were designed with level indication and an overflow return to the bulk storage tank.

The inspector observed the connection of the reservoirs to the diesel engine cylinder drain lines. The maintenance personnel coordinated the process and maintained communications with the main control room. The maintenance personnel performed the task in accordance with procedural guidelines, and Design Coordination Report DCR 90-013. Quality control personnel performed an independent review of the installation. The Operations Department established administrative controls for the reservoir isolation valves.

The inspector verified the Operations Department had properly installed locks on the new isolation valves. This modification represents a positive initiative to maintain diesel fuel oil quality.

4.2 Surveillance [61726]

The inspector observed calibration of the temperature switch that controls service water air handling fan 38B and reviewed the completed calibration data sheet for the temperature switch. The I&C technicians followed the procedure, were familiar with the logic for fan controls in the area, and were aware of the expected system response. The inspector concluded the instrument calibration was performed in a controlled manner.

5.0 EMERGENCY PREPAREDNESS

On June 4, 1992, New Hampshire Yankee (NHY) conducted a full-participation emergency exercise that was evaluated by the NRC. Response of off-site emergency organizations including the State of New Hampshire, the State of Maine, the Commonwealth of Massachusetts, and the local communities within the Emergency Planning Zone, was evaluated by the Federal Emergency Management Agency (FEMA). Six Massachusetts communities participated for the first time. FEMA held a public meeting on June 9, 1992, at the Seabrook Community Center, where the inspector presented an initial assessment of the on-site emergency organization's performance and FEMA presented an initial assessment of the off-site emergency organizations' performance. The final NRC evaluation will be documented in NRC Inspection Report No.50-443/92-10.

6.0 SECURITY [71707]

The inspector toured the protected area boundary, observed activities in the central alarm station, reviewed records, and observed security guards on patrol. An access door to the containment enclosure area required maintenance on several occasions throughout the period. Security personnel responded with contingency measures, while maintenance workers conducted door repairs. Engineering was evaluating upgrading security doors as part of Design Coordination Report 86-504, during the upcoming refueling outage.

The inspector noted two security door key card locations with loss of visual confirmation for access authorization. Audible response and physical barrier controls remained in service. The security force was cognizant of the discrepancies and the status of the work requests which were initiated to repair the key card readers. Maintenance workers completed the repairs. The inspector concluded that security equipment discrepancies continued to receive priority repair.

7.0 ENGINEERING/TECHNICAL SUPPORT

7.1 Pipe Chase Cooling Modification [37828]

The inspector reviewed Temporary Modification (TMOD) 92TMOD0017 for the installation of water cooled coils at the inlet to fans in the east and west pipe chases. The inspector observed portions of the TMOD installation and reviewed the associated 10 CFR 50.59 review. The Technical Support Department developed the TMOD and was responsible for monitoring the installed equipment. The Station Operating Review Committee reviewed the TMOD prior to implementation. The TMOD package addressed seismic, line break, and flooding issues. Maintenance workers installed barriers to protect the temporary lines from pedestrian and vehicular traffic. Technical Support engineers initiated a Request for Engineering Services, RES 90-556, to evaluate a permanent solution to cooling the pipe chases. The inspector concluded that engineering and safety reviews were adequately documented in the TMOD.

7.2 Lightning Protection [37700]

An electrician working in the off-site transmission yard questioned why a wire was suspended above the three off-site 345 KV electrical lines in the transmission yard. Engineering and Licensing Department personnel investigated the issue and held discussions with the inspector.

The wire is a ground strap suspended about 60 feet above the ground for lightning protection. The ground strap was not discussed in the Preliminary Safety Analysis Report or in the New Hampshire Yankee's (NHY) responses to NRC requests for additional information. Other structures which are constructed across the three off-site 345 KV electrical lines, such as vehicle bridges, were included in the responses to NRC requests for additional information and were evaluated in the Safety Evaluation Report.

The ground strap was designed to the same criteria as the rest of the transmission yard. A worst case failure of the ground strap could result in a loss of all off-site power, which is an analyzed accident. Initial evaluations identified that the safety factor of two for the footing and bolts for one of the ground strap towers was the lowest safety factor for the structure. NHY moved concrete barriers into position to protect the pole from vehicle accidents.

NHY was evaluating the present design of the ground strap, alternate designs for the future, and the need for updating the Final Safety Analysis Report.

7.3 Atmospheric Steam Dump Valve Design [92701]

On April 5, 1989, NRC Information Notice No. 89-35 was issued to describe the failure of atmospheric steam dump valves at the Palo Verde Nuclear Generating Station. Subsequently, on June 21, 1989, Control Components Inc. (CCI), the manufacturer of the atmospheric steam dump valves for both Palo Verde and Seabrook, issued a letter to Seabrook indicating a potential for piston ring leakage in the Seabrook atmospheric steam dump valves (ASDV). The Engineering Department completed Engineering Evaluation No. 89-026 "ASDV Failure Reportability Evaluation," which supported incorporating the CCI recommended design change. Engineers developed Minor Modification MMOD 89-608 to implement the design change. On November 6, 1989, New Hampshire Yankee (NHY) issued a letter (NYN-89142) to the NRC committing to complete the modification prior to plant heatup to operational Mode 3, Hot Standby. However, on December 15, 1989, NHY issued a letter (NYN-891630) to the NRC indicating MMOD 89-608 would not be installed and that valve operability would be verified by a performance monitoring program.

Specialist inspectors from Region I determined the performance monitoring program was adequate and documented their findings in NRC Inspection Reports Nos. 50-443/90-08 and 50-443/90-16. NRC Inspection Report No. 50-443/90-08 incorrectly stated that MMOD 89-608 was completed. The inspector held discussions with Technical Support personnel concerning the decision not to implement MMOD 89-608. Subsequently, a revision to Engineering Evaluation No. 89-026 was issued on March 9, 1992. The inspector reviewed the revised evaluation.

The revised evaluation concluded that the design changes recommended by CCI were enhancements to the existing design and that implementation of MMOD 89-608 should be considered in conjunction with future valve trim replacements. The Palo Verde ASDV failures had been affected by conditions other than piston ring leakage. Some Palo Verde valves were not installed as designed and packing gland followers had seized to the valve stem increasing the force required to open the valves. CCI determined that the Seabrook 8" diameter plug ASDVs were less likely to experience piston ring leakage problems than the Palo Verde 10" diameter plug ASDVs. The NHY monitoring program provided continued confirmation of ASDV operability.

The inspector concluded that the engineering basis for delaying implementation of recommended vendor modifications to the ASDVs was adequate and properly documented.

7.4 Termi-Point Clip Inspections [92701]

New Hampshire Yankee's (NHY) followup of Westinghouse Technical Bulletin NSD-TB-89-06 was reviewed in NRC Inspection Report No. 50-443/89-13. NHY conducted a complete pull test and visual inspection of all safety related Termi-Point clip connections installed in the solid state protection system. NHY planned to conduct a visual inspection of the non-safety related connections in the rod control and digital rod position indication systems during the first refueling outage. The Licensing Department identified that the inspection was never conducted.

The inspector held discussions with Technical Support personnel and reviewed Engineering Evaluation No. 90-02, Revision 1, "Termi-Point Clip Installations in Westinghouse & Supplied Cabinets," issued May 5, 1992. The Termi-Point clip connections in the non-safety related cabinets are of concern only for a seismic event where improper connections may lead to failures. The non-safety related equipment is not required for response to a seismic event. Failure of a Termi-Point connection would be detected by built-in failure detectors or alarms. Westinghouse letter NAH-89-3553 issued November 16, 1989, which supported postponement of visual inspections of Termi-Point clip on non-safety related equipment, noted that no reports of failures due to loose Termi-Point clips had been reported in any safety or non-safety related Westinghouse equipment.

Based on the revised Engineering Evaluation and past industrial experience, NHY postponed the visual inspection of non-safety related Termi-Point clips indefinitely. However, the I&C Department will develop guidance for technicians to look for improperly installed Termi-Point clips and to initiate corrective actions as necessary when working in the electrical cabinets.

The inspector noted that the engineering basis for postponing the manufacturer's recommended visual Termi-Point clip inspections of non-safety related equipment was adequate and properly documented.

7.5 Thimble Tube Thinning: Bulletin No. 88-09 (Closed) [92701]

NRC Inspection Report No. 50-443/91-29 documented an evaluation of New Hampshire Yankee's (NHY) incore instrumentation thimble tube thinning inspection and monitoring program. No deficiencies were noted. NHY reported the completion of the thimble tube initial inspection in a letter (NYN-91168) issued on October 8, 1991. The letter concluded there was no observable wear or degradation in either the inner or outer incore instrument thimble tubes. A letter from the NRC to NHY issued on January 23, 1992, closed Bulletin No. 88-09 based on NHY fully responding to the issues identified in the Bulletin.

The inspector reviewed Cramer and Lindell Engineers, Inc. report, "Eddy Current Inspection of Incore Flux Thimble Tubes at Seabrook Station, September 1991." The report concluded there was no evidence of tube damage or wall thinning. However, 20 of the 58 thimble tubes recorded abnormal indications. The abnormal indications of fourteen outer tubes at either the lower core plate or lower core support forging were attributed to external deposits, cold working of the

tubes, distortion of the tubes, or alignment of tubes. The abnormal indication of five inner tubes and one outer tube was attributed to sludge, particles imbedded in the tubes, or local inconsistencies within the tubes. The report stated that the indications did not affect the integrity of the thimble tubes.

The inspector concluded that the initial report on thimble tube thinning was detailed and confirmed tube wall integrity. This bulletin is closed.

7.6 Rosemount Transmitters: Bulletin No. 90-01 [92719]

NRC Bulletin 90-01, "Loss of Fill Oil in Transmitters Manufactured by Rosemount," requested that New Hampshire Yankee (NHY) identify and take appropriate corrective actions for Rosemount transmitters susceptible to fill-oil leakage. NHY's response contained in letters dated March 8, 12, 13, and 14, 1990, were evaluated in Supplement No.9 to NUREG-0896, "Safety Evaluation Report Related to the Operation of Seabrook Station." NUREG-0896 concluded that NHY had adequately addressed the recommendations of Bulletin 90-01.

The inspector reviewed NHYs "Rosemount Transmitter Trend Program Annual Reports" for 1990 and 1991, and a memorandum issued on April 8, 1992 that updated the Rosemount transmitter trend program. Sixty-one Rosemount transmitters are included in the trending program. Since the program inception, five transmitters were replaced due to excessive drift and three transmitters were replaced due to erratic operations. Rosemount conducted destructive testing on transmitter S/N 407508 Model 1153 which had been removed due to drifting. The testing confirmed that oil leakage was present. Other model 1153 and 1154 transmitters that had been removed, were returned to Rosemount for analysis and repair. Results have not been received. As a result of the trending program other problems such as corrosion deposits in sensing lines, air in sensing lines, and a loose termination connection to the main plant computer were discovered and corrected.

The inspector concluded that procedures responsive to Bulletin No. 90-01 were in place and had effectively identified transmitters with fill-oil leakage prior to instrument failure.

7.7 Service Water System Problems: Generic Letter 89-13 [92719]

Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," requested licensees address five NRC recommendations. New Hampshire Yankee (NHY) responses to the request were contained in five letters issued between February 9, 1990 and October 18, 1991. The NRC issued a letter to NHY on May 1, 1992, which concluded that NHY responses to the Generic Letter and Supplement 1 were acceptable and that all licensing actions were completed. The inspector held discussions with Technical Support engineers and reviewed internal memoranda, procedures, and performance trending data.

In response to Recommendation I, NHY initiated the trending of flow resistance for the service water tunnels in January 1991. The first order regressions for the flow resistance for the intake and discharge tunnels indicated no significant biofouling.

In response to Recommendation II, NHY developed procedures ES 1851.020, "Primary Component Cooling Water System Performance," and ES 1852.061, "Diesel Generator Jacket Water Heat Exchanger Thermal Performance." The procedures included testing programs for collecting data to trend performance of the primary component cooling water (PCCW) heat exchangers and the diesel generator jacket water heat exchangers. The weekly performance data for PCCW heat exchanger efficiency for 1992 indicated consistent performance.

In response to Recommendation III, NHY developed a service water pipe lining inspection program. During the 1991 refueling outage, an NRC inspector evaluated the implementation of the program as adequate. The details of the evaluation were documented in NRC Inspection Report No. 50-443/91-32.

In response to Recommendation IV, Technical Support engineers conducted a review of the Seabrook Station P&IDs, the Final Safety Analysis Report P&IDs, and the outstanding design changes for the PCCW system. The engineers also performed an as-built walkdown of the system. The engineers concluded that the PCCW system could perform its intended function in accordance with the licensing basis of the plant.

In response to Recommendation V, the Independent Safety Engineering Group conducted an evaluation of the human errors in the operation, repair, and maintenance of the PCCW system. The evaluation concluded that the practices, procedures and training involving the PCCW system were adequate to ensure the safety-related equipment cooled by the PCCW system would function as intended and that operators of the equipment would perform effectively.

The inspector concluded that the programs described in NHYs response to Generic Letter 89-13 were implemented and provided adequate assurance of continued monitoring of the service water and PCCW systems.

8.0 SAFETY ASSESSMENT/QUALITY VERIFICATION [40500]

8.1 Information Reports

The inspector reviewed selected station information reports (SIR) and operational information reports (OIR) to assess the quality of the New Hampshire Yankee's (NHY) self assessment capabilities.

SIR 92-018 evaluated the yoke to bonnet cap screws in safety related Copes-Vulcan valves that were manufactured from different material than that specified on vendor drawings. Technical Support engineers determined that the valves were operable based on Copes-Vulcan and

Westinghouse testing and analyses of the incorrect cap screws. NHY planned to replace the cap screws and to review the type of material in the cap screws on Copes-Vulcan valves in the storeroom.

OIR 92-021 evaluated the use of incorrect grease in the switch gearbox of four non-safety related Limitorque motor operated valves. The receipt inspection of the valves did not include certification of the type of grease. Maintenance replaced the grease with the correct grease. The Technical Support system engineer identified eight other valve operators which had received the same type of receipt inspection and verified that an adequate grease inspection had been performed. Spare limit switches in inventory were inspected for proper grease and the Procurement Department added a clause in 1989, to the generic purchase order for motor operated valves which specified the use of Mobilgrease 28 in Limitorque limit switches.

OIR 92-023 evaluated an auxiliary operator's accidental closure of a feedwater heater extraction steam motor operated valve during performance of a surveillance test. The auxiliary operator inadvertently bumped the control switch with his clip board while using a radio. Engineering evaluated a design modification to the area to eliminate the need for radio communications and auxiliary operator training was conducted.

OIR 92-025 determined that the cause of a failure to correctly position a test isolation valve was improper manipulation of the control switch. Additional training was planned to alert all operators to the operating characteristics of seal in circuits in valve control switches.

OIR 92-026 determined that the cause of overflowing a service water strainer as improper maintenance personnel action. Planned corrective actions included maintenance workers completing a work request to adjust the mechanical travel stop on a service water butterfly valve, station supervisors discussing proper control and identification of equipment deficiencies with their workers, and the Mechanical Maintenance Department Supervisor reminding his workers not to manipulate Operations Department equipment.

OIR 92-029 evaluated whether sealing wires should be installed on electrical test block covers installed in safety related, seismic applications. Analysis by ABB Power Distribution and testing by NHY engineering personnel confirmed that sealing wires were not required for seismic qualification. However, due to observed movement of the covers, the Operations Department installed the sealing wires.

The inspector concluded that a self-assessment program was functioning effectively to review and evaluate operational events and equipment deficiencies.

8.2 Finding Review Board

The inspector observed a Finding Review Board meeting. The Finding Review Board is composed of the Nuclear Quality Group supervisors and is chaired by the Nuclear Quality manager. The Board meets monthly to review the findings contained in the previous month's

quality assurance reports. The Board discussed findings related to independent verification of corrective actions, adequacy of station program procedures, the potential for unanalyzed failure modes resulting from modifications to non-safety related equipment, documentation of worker qualification, and the need for other departments to evaluate the generic implication of specific findings. The inspector concluded that the Finding Review Board was effective in improving the quality of the documentation of report findings.

9.0 MEETINGS

The scope and findings of the inspection were discussed periodically throughout the inspection period. An oral summary of the inspection findings was provided to the Station Manager and his staff at the conclusion of the inspection period.

Region-based inspectors conducted the following exit meetings during this time period.

DATE	SUBJECT	REPORT NO.	INSPECTOR
June 5	Emergency Preparedness	92-10	J. Laughlin