U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Number: 95-11

Docket No.: 50-443

License No.: NPF-86

Licensee: North Atlantic Energy Service Corporation
Post Office Box 300
Seabrook, New Hampshire 03874

Facility: Seabrook Station

Dates: August 15, 1995 - September 2, 1995

Inspectors: John B. Macdonald, Senior Resident Inspector
David J. Mannai, Resident Inspector
E. Monte Conner, Project Engineer

Approved By: John Rogge, Chief — Date: 11/14/95
Division of Reactor Projects, Branch 8

Inspection Summary: Inspections were conducted during normal and backshift hours in the areas of plant operations, maintenance, engineering, and plant support. Routine inspections included an emergency feedwater system walkdown, follow-up of issues from the July 6, 1995, containment sump isolation valve inoperability, observation of in-progress modifications and surveillance testing, closure of outstanding NRC inspection report items, oversight of an emergency preparedness drill, and observation of refueling outage preparations. Initiative inspections included a detailed review of the maintenance backlog, review of the spent fuel rack Boraflex monitoring program, and of a recent licensee practice of including industry experience briefings at the station manager daily meeting.

Results: The results of the inspection are summarized in the Executive Summary. The inspectors reviewed the licensee responses to several previously identified NRC Inspection Report unresolved items and violations. The following items were reviewed and closed: unresolved item 50-443/93-80-08, regarding the use of threaded pipe joints on the emergency diesel generator air start systems; Notice of Violation 50-443/94-03-02, regarding inadequate main steam isolation valve maintenance; unresolved item 50-443/94-05-02, regarding safe shutdown procedure and procedure bases inconsistencies; Notice of Violation 50-443/94-08-01, regarding procedural noncompliances that led to personnel injuries when opening the containment personnel air-lock doors on April 10, 1994; unresolved item 50-443/94-13-01, regarding several equipment tagging deficiencies; Notice of Violation 50-443/94-15-02, regarding the failure to properly inventory Emergency Preparedness facilities and equipment, and; unresolved item 50-443/94-22-01, regarding the resolution of previously degraded service water pump column flange bolts.

EXECUTIVE SUMMARY

SEABROOK STATION
NRC INSPECTION REPORT NO. 50-443/95-11

Plant Operations: Control room operations were properly conducted throughout the report period. Operators were attentive to plant status and responded promptly to alarms. Logs thoroughly reflected plant operations and communications were clear, with repeat-back verifications. Self checking practices were noted to be used on several occasions. A focused walkdown of the emergency feedwater system and review of associated surveillance requirements verified that the system was being properly maintained in standby readiness. Operations section personnel effectively reviewed and addressed inspector concerns regarding the July 6, 1995, containment sump isolation valve inoperability. Weaknesses regarding Technical Specification applicability and temporary modification implementation requirements were effectively resolved.

Maintenance: Modifications to the circulating water traveling screen control system were effectively implemented. Good craft knowledge and procedure usage were noted. An inspector question regarding the control of equipment tagging was properly addressed. A quarterly emergency feedwater system performance test was well controlled. Good system engineering support was observed. Notwithstanding, a weakness was identified in the lack of independence between the performing and verifying technicians during post-test venting of the system. The maintenance backlog is being effectively managed. Deficiencies are being properly identified, evaluated, prioritized, and resolved. Additionally, equipment failure histories are being evaluated and trended to assess the effectiveness of existing maintenance practices.

Engineering: Appropriate technical and administrative actions were implemented, facilitating the review and resolution to several outstanding NRC inspection items. A comprehensive monitoring program exists to evaluate potential Boraflex degradation in the spent fuel racks. The program is consistent with existing industry guidance. Reactor engineering personnel were knowledgeable of recent NRC Information Notices regarding Boraflex degradation and have effectively managed the monitoring program at Seabrook.

Plant Support: Good control and coordination between health physics and security personnel was noted during the movement of material to various onsite locations in preparation for the upcoming refueling outage.

Safety Assessment/Quality Verification: The implementation of informal industry experience briefings at the daily station manager meeting is a positive initiative. The forum provides a setting for the quick dissemination of industry events that have a wide potential for applicability and interests.

TABLE OF CONTENTS

DETAILS

1.0 Summary of Facility Activities

The reactor was operated at approximately 100% of rated thermal power throughout the inspection period. The service water access vault construction continued during the report period. The inspectors reviewed the maintenance backlog and found it was appropriately prioritized and managed (Section 3.3). On September 20, the licensee conducted the 1995 Seabrook Station Annual Medical Emergency Drill. The licensee drill demonstrated the ability to respond to a contaminated worker medical emergency in an effective and timely manner.

2.0 PLANT OPERATIONS (71707,71750,92901,93702)

2.1 Plant Operations Review

The inspector observed the safe conduct of plant operations (during regular and backshift hours) in the following areas:

Control Room	Fence Line (Protected Area)
Primary Auxiliary Building	Residual Heat Removal Vaults
Diesel Generator Building	Turbine Building
Switchgear Rooms	Intake Structure
Security Facilities	

Plant housekeeping, including the control of flammable and other hazardous materials, was observed. During plant tours, logs and records were reviewed to ensure compliance with station procedures, to determine if entries were correctly made, and to verify correct communication of equipment status. These records included various operating logs, turnover sheets, tagout, and lifted lead and jumper logs.

Control room instruments were independently observed by NRC inspectors and found to be in correlation amongst channels, properly functioning and in conformance with Technical Specifications. Alarms received in the control room were reviewed and discussed with the operators; operators were found cognizant of control board and plant conditions. Control room and shift manning were in accordance with Technical Specification requirements. Posting and control of radiation, high radiation, and contamination areas were appropriate. Workers complied with radiation work permits and appropriately used required personnel monitoring devices.

2.2 Emergency Feedwater System Walkdown

The inspector performed a detailed review of the emergency feedwater system. This review consisted of walkdowns of key components, valves and breakers, and a review of operating and surveillance procedures.

The inspector found the system to be aligned in accordance with system operating procedures. The material condition of the system appeared good, including general cleanliness and lighting in the areas. Surveillance tests reviewed were properly completed and fulfilled the requirements of the Technical Specifications. The inspector discussed several technical aspects

of the system with the system engineer and found the system engineer extremely knowledgeable. The inspector had no remaining questions or concerns regarding the emergency feedwater system.

2.3 Containment Sump Isolation Valve Inoperability Follow-up

Previously, on July 6, 1995, both in-series containment sump discharge line containment isolation valves exceeded the in-service testing (IST) closure stroke time requirement of 2.0 seconds during a routine surveillance and were declared inoperable. This event is documented in detail in NRC Inspection Report 50-443/95-08, Section 2.3. The inspector identified two concerns during normal response to this event. Initially, the inspector noted that there was a delayed entry into the action statement of Technical Specification 3.6.1.1, regarding primary containment integrity. Additionally, the inspector noted that applicable operating procedures had not been revised to reflect off-normal system configurations established by a temporary modification that had been installed to maintain sump monitoring capability, while troubleshooting the inoperable isolation valves. These concerns were brought to the attention of the licensee at the time of the event. In response, the licensee initiated internal evaluations and corrective action processes that are addressed below.

2.3.1 Containment Integrity Requirements

During initial response to this event, operators immediately closed each isolation valve upon indication of the closure stroke time test failures. Additionally, actions were initiated to de-energize each valve in the closed position within four hours as required by Technical Specification (TS) 3.6.3, "Containment Isolation Valves." While doing so the operators did not immediately recognize that the stroke time failure of both containment isolation valves in the associated containment penetration, caused the penetration to be inoperable, therefore impacting containment integrity. Specifically, TS 3.6.1.1, requires that primary containment integrity be maintained during operational modes 1, 2, 3 and 4. Containment integrity is defined (TS Definition 1.7) to exist when all penetrations required to be closed during accident conditions are either: capable of being closed by an operable containment automatic isolation valve system, or closed by manual valves, blind flanges, or deactivated automatic valves secured in their closed positions. TS 3.6.1.1 further requires that without primary containment integrity, restore primary containment integrity within one hour or be in at least Hot Standby within the next six hours. Although each of the valves was closed upon surveillance test failure, supply power to each valve actuator was not deenergized until approximately one and a half hours after the second valve failed. Ultimately operators achieved collateral compliance with TS 3.6.1.1 by deenergizing the isolation valves in the closed position in accordance with TS 3.6.3 (four hour action statement), prior to exceeding the mode reduction requirements of TS 3.6.1.1.

The licensee initiated an Adverse Condition Report, ACR 95-183, to evaluate the applicability of TS 3.6.1.1. Initially, the ACR analysis concluded that for the conditions given in this event, entry into TS 3.6.1.1 would have been conservative and was not necessary. However, operations section management

convened an additional meeting to resolve continuing questions regarding this issue. The inspector was present at this meeting that was also attended by licensing, compliance, and engineering personnel. Operations section management referenced Standard Technical Specifications and the improved MERITS Technical Specifications to reach a consensus that TS 3.6.1.1 was independently applicable to the July 6, 1995 containment penetration operational status. Therefore, the initial corrective actions completed on July 6, 1995 that revised Technical Clarification TS-135 to state that TS 3.6.1.1 is applicable if redundant containment isolation valves are inoperable in a given penetration were appropriate. The inspector noted excellent and open discussion of potential TS interpretations at the meeting. Good management oversight was apparent that solicited dialogue while maintaining subject matter focus.

2.3.2 Operating Procedures for Temporary Modifications

The inspector had expressed concern that the licensee had installed a temporary modification (TM 95-0020), but had not revised operational procedures nor generated temporary procedures to address operation of the associated systems that had been placed in an operational configuration not addressed by existing procedures. In the specific instance of concern, a temporary flexible hose cross-connection between nonsafety-related portions of the containment sump and reactor coolant drain tank discharge lines located inside the containment building was established to allow continued sump monitoring and discharge capability while concurrently facilitating troubleshooting of the containment sump discharge line isolation valves that had failed a quarterly in-service test close stroke time surveillance. The temporary modification was technically adequate and properly supported by an associated safety evaluation. The licensee indicated that because the temporary modification presented minimal change to the affected systems and was anticipated to be installed for a very brief period, that controls such as tagging orders and temporary modification instructions were sufficient to ensure proper system operation. Following continued inspector questioning regarding a consistent basis for the operational controls of systems affected by temporary modifications, the licensee initiated an internal review to establish a generic administrative basis for this position.

During this report period, the licensee identified that operations personnel had referenced a decontrolled copy of the temporary modification procedure, MA 4.3, when developing the temporary modification. The decontrolled procedure had since been updated to require that operational procedures be revised if affected by the installation of a temporary modification regardless of the complexity or anticipated duration of installation for the modification. The licensee issued Adverse Condition Report, ACR 95-266, to document this occurrence. As stated above and previously in NRC Inspection Report No. 50-443/95-08, the temporary modification in question was of negligible installation complexity and safety consequence. The licensee review of the inspector concern identified weaknesses in the administration and usage of controlled procedures. Continued independent inspector reviews confirmed that this event was an isolated occurrence. The corrective actions to the ACR restored quality to the control copy procedure bank referenced in the

development of this specific temporary modification. This is considered a non-cited violation.

The inspector had no further questions regarding either previous concern related to the July 6, 1995, period of inoperability of the containment sump isolation valves.

3.0 MAINTENANCE (61726,62703,92902)

3.1 Circulating Water Traveling Screen Modification

On September 19, 1995, the inspector observed portions of the modification to revise the control logic for circulating water system traveling screen 1C. The work consisted of installing a new control switch and timer per MMOD 93-518 and work request 95WO01200. The modification will allow auto or manual operation of the traveling screen in either the fast or slow screen travel speeds. The inspector questioned involved maintenance personnel and found them knowledgeable of the work package and modification. The procedure was actively utilized in a step-by-step manner. The inspector observed good communication and coordination between the maintenance personnel working in the control cabinet and the person assisting. The inspector observed that the control switch, which was removed to implement the modification, had a danger tag hung on the control cabinet requiring the switch to be in the off position. The inspector questioned the Operations department regarding the removal of a tagged component. The inspector expressed concern regarding control of the position of the removed equipment, particularly during restoration when tags are removed. The licensee indicated the danger tags hung on control switches are used to identify that the associated equipment is tagged out and not for personnel or equipment protection, and therefore did not represent a tagging violation or personnel hazard. However the removal of the component, while not specifically prohibited by procedure, did not meet Operations department management expectations. The tagging order was changed to remove the tag from the control switch. A tagging order procedure revision that was in progress will be modified to provide additional clarification regarding use of tags on control switches. Additionally, the Operations Department issued a memorandum to clarify expectations on the use of tags on control switches. The inspector considered that the planning process had represented an opportunity to identify that the switch required removal in order to perform the modification and therefore should not have included the control switch in the associated tagging order. The inspector had no further questions.

3.2 Turbine Driven Emergency Feedwater Pump Surveillance

On September 12, 1995, the inspector observed the quarterly flow surveillance test for the turbine driven emergency feedwater pump (EFW) FW-P-37A, Procedure OX1436.02 (RTS 95R003054004) in the EFW pump room. The inspector independently verified that the test acceptance criteria was satisfactory for flow, discharge pressure, differential pressure, pump speed and pump vibration and that equipment operated per design. Measuring and test equipment calibration was current. Personnel in the field performed the test correctly using the procedure in a controlled step-by-step manner. Good self checking

practices were used by the nuclear system operator (NSO) during valve positioning. The inspector witnessed good communication and coordination with the control room during the performance of the test. The system engineer was present for the duration of the surveillance test. The inspector later reviewed the completed surveillance procedure and questioned maintenance department supervision regarding the manner in which the procedural signoffs for performance and verification of venting operations of the differential pressure flow cell were made. The procedure required that the person performing the final valve position verification not be the person who performed the venting. The two individuals who performed the venting procedure alternated performance and verification throughout the entire venting operation including final verification. Maintenance department supervision reviewed the document and concluded the manner in which the venting operation was performed did not meet supervisory expectations. A procedure revision is being generated that is intended to clarify instructions and expectations regarding technician performance and configuration verification expectations. The inspector had no further questions.

3.3 Maintenance Backlog

The inspector conducted a review of the licensee maintenance backlog, during this inspection period. The review was performed to assess the licensee's management of safety-related equipment deficiency backlog. The inspector reviewed outstanding maintenance items, and held discussions with maintenance department management. The inspector found the licensee's threshold for documenting and prioritizing equipment deficiencies was good. The licensee has four levels of priority, priority one signifying top priority and priority four indicating low priority.

The Maintenance department has developed several categories of open work requests. The work request categories are backlog, plant outage required, future design/plant enhancements and paper closeout. Within each category, the outstanding items are broken down into safety-related and nonsafety-related. The licensee recently established more aggressive backlog reduction goals. A new minor maintenance program, which is continuing to develop, is expected to facilitate more efficient correction of minor equipment and hardware deficiencies. The outage required work requests require the plant to be in either a forced or refueling outage. Once the plant is in a refueling or forced outage the outage required work requests which are scheduled for completion are made part of the backlog.

The inspector also verified and assessed whether the licensee effectively reviews equipment history or maintenance records to identify repetitive failure or adverse trends which may indicate ineffective maintenance. The system engineer for the particular system is responsible for evaluating and trending equipment failure rates. All work requests for a particular system are reviewed by the system engineer and should repetitive equipment failures or adverse trends be identified an adverse condition report (ACR) is written to document the problem and establish comprehensive corrective actions. The Technical Support section issues a system annual performance report which assesses system performance and outlines what actions, if any, are necessary to correct or enhance system performance. Earlier this year the licensee,

specifically the Technical Support section, began using computerized online system performance monitoring which significantly improved the ability to detect the onset of adverse system performance trends. Additionally the Occurrence Review Committee (ORC), which meets daily to review ACRs, also reviews work requests to determine if an ACR is warranted.

Overall, the inspector concluded the licensee effectively documents, prioritizes, and manages the maintenance backlog. The inspector noted there were no priority one safety-related work requests and six priority two safety-related work requests in the backlog at the time of review. The current trend for the maintenance backlog is essentially downward. The safety-related backlog was approximately 10% of the total maintenance backlog. However, the inspector noted there were several low priority deficiencies with little impact that dated back to 1992 and 1993. The maintenance department management anticipates the minor maintenance program, which is expected to be more fully developed and implemented after the upcoming refueling outage, to further reduce the backlog. Equipment failure history is adequately evaluated and trended for effective maintenance practices as well as equipment deficiencies. The system engineer involvement with reviewing work requests for adverse trends, system performance assessment, and online system performance monitoring were considered a strength. The ORC review of work requests provides defense in depth for identifying adverse trends regarding equipment performance and effective maintenance. The inspector noted that while station goals exist with regard to total number of backlog items no goals presently exist pertaining to the age of the open work request. The inspector had no further questions.

4.0 ENGINEERING (71707,37551,92903,40500)

4.1 (CLOSED) Unresolved Item 50-443/93-80-08 - Threaded Joints

During NRC Team Inspection 50-443/93-80, the team noted that the emergency diesel generator air start subsystem used threaded union couplings to connect the various piping and components on the air start skid. The issue was left unresolved pending a detailed evaluation of the acceptability of threaded coupling used in a vibration and shock area, incorporating torque requirements for threaded fittings in licensee's applicable procedures, and further review by the NRC.

The inspector reviewed written analysis provided by the licensee, talked to system engineers, and physically observed the emergency diesel generator (EDG) air start subsystem. A number of threaded couplings used on the air start subsystem are unions provided for maintenance and testing of valves, check valves, dryer cartridges, and other components requiring upkeep. The updated FSAR states in 9.5.6.1.c that, without recharging the air receiver, each starting air system is capable of starting a diesel generator within 10 seconds at least five times. Thus, the piping of importance for diesel start-up is the line out of the air tanks. At the discharge of the air tanks, there are dual 2-inch (inside diameter) high quality forged steel unions fully supported by the skid design. All pipe fittings from the tanks to the air start cylinder distributors are welded except for the two union hubs. These unions have machined metal-to-metal seat contact with no internal gasket.

This use of unions is allowed by ASME code ND-3671.3, Threaded Joints. The licensee response to this issue stated that the original installation of these unions by Colt employed only standard work practices and techniques. Precise joint torque values for the unions were neither required nor specified as part of the original Colt air start skid seismic qualification. Proper tightness requirements for the air start skid piping unions are ensured by the successful performance of a pressure test verifying leak tightness of the entire system in accordance with post maintenance testing. Based on the review performed, this item is closed.

4.2 (CLOSED) Notice of Violation 50-443/94-03-02 - MSIV Maintenance History

During NRC Inspection 50-443/94-03, it was determined that the licensee's previous efforts to diagnose and fix the main steam isolation valve (MSIV) equipment deficiencies were inadequate, that MSIV events from December, 1992 to October, 1993 were not adequately evaluated to identify the root cause, and that the past inadequate MSIV root cause determinations reflected a poor safety perspective with respect to this issue. The licensee's April 22, 1994 letter responding to this Notice of Violation (NOV) stated that, in addition to extensive MSIV maintenance performed before restart, they had conducted a detailed event evaluation, an expanded root cause analysis, and a human performance evaluation. Their root causes were inadequate failure analysis of previous MSIV anomalies, inadequate MSIV preventive maintenance program, and inadequate workmanship and quality assurance practices when the MSIVs were rebuilt in 1991.

The inspector reviewed the licensee's NOV response, their Station Information Report (SIR) 94-006, dated May 3, 1994, and the Licensee Event Report (LER) 50-443/94-01-01, dated March 25, 1994. In addition, discussions were held with several engineers. Corrective actions to address the primary root causes identified were to upgrade the cause and failure analysis, to take the preventive maintenance program beyond that specified by the MSIV vendor, and to perform an assessment of the site program for reviewing and approving vendor QA programs. These issues were the subject of a 1994 Joint Utility Management Audit of NAESCO. The recommended corrective actions are, in accordance with a North Atlantic internal memorandum dated October 31, 1994, being actively pursued by the administrative services division with anticipated closure by January 1, 1996.

The inspector questioned the affects of these corrective actions on other systems. In discussions with system engineers, it was learned that the lessons learned were applied to other systems, especially the feedwater isolation valves, where routine sampling of hydraulic fluid and changeout of filters were added to the preventive maintenance program. The inspector concluded that appropriate corrective actions were initiated and, therefore, this violation is closed.

4.3 (CLOSED) Unresolved Item 50-443/94-05-01 - Engineered Safety Feature System Walkdown

During NRC Inspection 50-443/94-05, a comparison of the Updated Final Safety Analysis Report (UFSAR) Section 7.4, Systems Required for Safe Shutdown and

Maintenance of the Reactor in Cold Shutdown Conditions, was made with the physical remote safe shutdown (RSS) control locations and the controlling Abnormal Operating Procedures, OS1200.02, 02A & B, describing the Safe Shutdown and Cooldown from the Remote Safe Shutdown Facilities. The inconsistencies noted were between the UFSAR and OS1200.02 series procedures and between the abnormal RSS and OS1200.02 series procedures. The licensee agreed to take steps that would clarify these inconsistencies, determine whether the labeling of additional RSS equipment is required and further review NRC questions.

The inspector reviewed Engineering Evaluation 94-020, Remote Safe Shutdown Equipment, UFSAR Change Request 94-035, talked to a licensed senior reactor operator (SRO), and physically observed the RSS panels in question. As a result of NRC Inspection Report No. 50-443/94-05 findings, the licensee further reviewed the UFSAR Table 7.4-1 and identified other inconsistences with the abnormal RSS and OS1200.02 series procedures. The NRC and licensee identified UFSAR inconsistencies were corrected by Revision 3 to the UFSAR and corrections to RSS equipment tagging (add/modify purple RSS tags). The inspector found these corrective actions acceptable and, therefore, this item is closed.

4.4 (CLOSED) Notice of Violation 50-443/94-08-01 - Containment Personnel Hatch Event

On April 10, 1994, workers were blown out of the containment personnel air-lock while maintenance workers were in the process of opening the inner and outer containment personnel air-lock doors. The licensee's event evaluation team attributed the root cause to failure to follow procedural instructions. Other contributing factors included: the lead supervisor should have assigned two workers to perform the task, the job briefing did not cover the potential consequence of incorrect actions (the lead supervisor knew of a previous event in 1991 where a worker got injured), and various procedural inadequacies. However, inspection 94-008 identified one significant contributing cause that needed further evaluation and further corrective actions. No formal or informal training had been given to workers for the hatch interlock removal and door opening task. Other than giving supervisors additional training on assigning work tasks, the evaluation report did not develop any corrective actions to address the lack of training for this critical task. The lack of worker training and familiarity with the air-lock equipment directly contributed to this event. This issue was cited as a violation of 10 CFR 50, Appendix B Criterion II, which specifies that personnel performing activities affecting quality shall be provided with the necessary indoctrination and training to assure that suitable proficiency is achieved and maintained.

The inspector reviewed licensee's July 6, 1994, response to the violation, their SIR 94-027, other North Atlantic corrective action memoranda, and revised procedures OS1058.03 and 04, "Disable the Mechanical Interlocks and Open Both Containment Personnel Hatch Airlock Doors at the Same Time," and "Enabling Personnel Hatch Airlock Door Mechanical Interlocks," respectively. Review of OS1058.03 and 04 indicated a number of important changes such as: the responsibility for performing this work has been moved from maintenance to operations; the procedure specifies warnings about improper opening of the

hatch doors; three operations department personnel are needed to do the job; the delta pressure across the hatch doors was reduced from 0.5 to 0.098 psid; and the inside door opening during pressure equalization was reduced to a maximum of five inches. The inspector considered these changes appropriate.

The four corrective actions that were committed to in the July 6, 1994 letter have been completed except for the qualification guides that needed to be developed or revised (Item 3). The inspector found that considerable work on the guides has been completed and the staff plans to have all qualification guides ready before the start of the refueling outage. Several guides and the overall qualification record for mechanical maintenance were reviewed. The inspector concluded that corrective actions have been made to insure safe operation of the containment air lock doors and, therefore, this violation is closed.

4.5 (CLOSED) Unresolved Item 50-443/94-13-01 - Equipment Tagging Issues

During NRC Inspections 50-443/94-03 and 94-13, four specific cases of inadequate tagout of safety equipment were identified. In addition, the licensee had initiated a review of tagging-related events identified by their SIR or OIR systems. The licensee's review was documented in a Nuclear Safety Engineering Report, RE 04075B, Post-OR03 Tagging Program Review, Final Report, issued April 6, 1995. By Standing Order (SO) No. 95-017, the Station and Operations Department management imposed very stringent new requirements for tagging and restoration of equipment. On September 7, 1995, the inspector, along with the senior resident, had a meeting with Operations Department management where this issue was discussed in detail especially as it relates to the upcoming refueling outage.

The inspector reviewed the extensive tagging program review, Standing Operating Order (SOO) 95-013 and 95-017, both on Tagging Order Philosophy, the January 19, 1995 draft version of Maintenance Manual (MA) 4.2, Equipment Tagging and Isolation, and the information provided in the special meeting. The licensee's extensive tagging program review identified recurring causes and contributing factors among the 33 tagging-related events documented in 1994 by SIR or OIR. The number of events having causal factors (CFs) in each of the licensee's major category was: People (including work practices)- 28; Work Practices (including work organization/planning)- 22; Tools (including written procedures/documents)- 18; and, Equipment (including man-machine interface)- 7. The most recurring CF in each major category are shown in brackets.

SOO 95-017, issued following an external audit body evaluation on this subject, greatly improves the preparation of tagging orders, the review and approval of tags, the hanging and confirmation of tagging, and the similar restoration process. No tagging errors have occurred since initiation of SOO 95-017. The inspector found the tagging program review and the changes in the tagging requirements brought about by implementation of SOO 95-017 and proposed by the draft MA 4.2 to be acceptable and, therefore, this item is closed.

4.6 (CLOSED) Notice of Violation 50-443/94-15-02 - Failure to Properly Inventory Facilities and Equipment

During NRC Inspection 50-443/94-15, it was determined that station's emergency radiation detecting instruments were not source checked during quarterly inventories, materials having limited shelf-life were not replaced as needed, cabinets containing instruments and materials were not opened for inventory, inventory lists for various lockers were not current or up to date, and several equipment locker inventory discrepancies existed. By letter dated September 30, 1994, the licensee responded to the Notice of Violation (NOV). In addition, the licensee provided the results of a QA Audit, Adverse Condition Report # 95-043, dated May 16, 1995, and a revised Seabrook Station Emergency Preparedness Facility Inventory Manual, dated June 30, 1995.

The inspector reviewed the NOV response, the QA Audit, and the revised EPFI procedure, and discussed this issue with the licensee's EP staff. The licensee determined the root cause to be poor job performance. They have taken actions to reassign responsibility for the EP facility inventory program, to revise the emergency response plan and the inventory control procedure, to restructure the EP facility maintenance program, and to revise and update their inventory data-base computer system.

The inspector made a detailed inspection of Operational Support Center (OSC) emergency locker #'s 1 and 3. Three minor discrepancies were noted in locker #1 and discussed with the licensee. The inspector noted a broken key on the HP Key ring. The licensee stated that this key was not needed because it was available in the supervisor's key box that was accessible by the HP technicians. Second, the calibration of extra TLDs could not be confirmed since no "check and record calibration date" was labeled on the badges. The licensee stated the TLDs were replaced at the same time as other site TLDs. The inspector suggested that the bag of TLDs could be labeled so the calibration could be confirmed. The licensee later notified the inspector that this suggestion was adopted. Third, the Hydrogen Analyzer (Exotector) had no calibration date sticker as required by the inventory checklist. The licensee provided Station Operating Procedure HD0955.40, Use of the G634P Exotector Combustible Gas Detector, which specifies "no routine calibration is required." They stated that calibration checks were added for all instrumentation when the inventory checklists were revised. Therefore, the checklist was in error. The inspector concluded that, although some cases of poor attention to details still exist. However, required improvements have been made and this violation is closed.

4.7 (CLOSED) Unresolved Item 50-443/94-22-01 - Service Water Pump Bolt Degradation

During NRC Inspection 50-443/94-22, the operations staff at Seabrook Station was provided a metallurgical evaluation report discussing degraded conditions found on the flange bolts used in the pump column sections for the four service water and two cooling tower pumps supplied by the Johnston Pump Company. The identified degraded bolt conditions relate to the discovery that the pump column flange bolts were not properly solution annealed in accordance with the ASME SA-193 material requirements. The lack of proper heat treatment

results in sensitization of the stainless steel bolt material. While the mechanical properties of the bolts are not adversely affected, the sensitization reduces the corrosion resistance of the material, particularly in an aqueous environment. The bolts from the ocean and cooling tower pumps were tested and found to be sensitized, indicating that all six pumps could be susceptible to the corrosion problems. This issue was left unresolved pending implementation of the repair plan, evaluation of the vendor bolt supplier, and confirmation of the exact failure mechanism.

The licensee obtained one-thousand new SA193-B8M bolts and planned to replace all the questionable bolts on the wetted flanges of all six pumps after acceptable lot testing of the new bolt was performed. Starting October 17, 1994, the four SW pumps were overhauled for bolting replacement. Only one bolt, from SW-P-41C, was determined to be significantly degraded. On October 31, 1994, cooling tower pump SW-P-110A was replaced with a spare pump which had the new bolting material. This pump had a total of 59 bolts that were determined to be significantly degraded, including 12 bolts that broke during removal. It was determined that SW-P-110A had been inoperable for an indeterminate amount of time due to its potential inability to meet its seismic design basis. SW-P-110B was also replaced with a rebuilt pump. It only had seven (7) significantly degraded pump column bolts. The repair plan was completed by the end of 1994. The resident inspectors had closely followed the repairs of these pumps as documented in NRC Inspection Report No. 50-443/94-24, Section 2.2. This issue was left unresolved pending NRC review of the vendor aspects of the issue.

The inspector reviewed SIR # 94-072, LER 50-443/94-017-00, and NAESCO letters to the NRC, dated September 30 and December 27, 1994, all related to Service Water System Pump Bolt Degradation. In addition, the inspector discussed this issue with engineering. North Atlantic concluded that the primary cause of the bolt material degradation was improper heat treatment by California Nut and Bolt, and Southern Bolt and Screw Company, the bolt suppliers for Johnston Pump Company. These companies, now out of business, provided bolting materials that did not meet ASME Section III requirements. A contributing cause was determined to be a lack of sufficient oversight during receipt inspection of the subject bolting material by Johnston Pump Company. Their review also provided confidence that the generic implications of this issue were limited to the specified subset of bolting material.

LER 50-443/94-017-00 left the lack of sufficient oversight during receipt inspection issue open to be determined by a North Atlantic evaluation of the Quality Assurance program that Johnston Pump Company uses to procure and supply ASME safety class material. The licensee provided a June 9, 1995 memorandum summarizing the limited scope audit performed by Yankee Atomic Electric Company (YAEC). This summary indicated that four observations, determined not to be of significance, were identified. It concluded that Johnston Pump's QA program has been enhanced so that the concern noted in SIR-94-72 should not recur. The inspector requested and reviewed the audit reports VAR-95-025 and VAR-94-064, both YAEC audits of the Johnston Pump Company. The inspector concluded that the licensee's performance during service water pump degradation was very good. This item is closed.

4.8 NRC Information Notice 95-38: Degradation of Boraflex Neutron Absorber in Spent Fuel Storage Racks

On September 8, 1995, NRC Information Notice (IN) 95-38 was issued to alert licensees to a potentially significant problem pertaining to the degradation of the Boraflex neutron absorber material in spent fuel storage racks. Previously, NRC IN 87-43, dated September 8, 1987 and NRC IN 93-70, dated September 10, 1993 were issued alerting licensees to related Boraflex degradation concerns.

During this inspection report period, the inspector conducted an independent review and inspection of the licensee Boraflex monitoring program in light of the concerns raised in these NRC Information Notices. Appendix C to Electric Power Research Institute (EPRI) Final Report, "An Assessment of Boraflex Performance in Spent Nuclear Fuel Storage Racks," dated December 1988 (EPRI NP-6159), establishes the guidelines for a standard Boraflex coupon surveillance program. The inspector reviewed licensee procedure, RN 1745, "Boraflex Monitoring Program," and determined it is consistent with the guidelines provided in EPRI NP-6159. Specifically, the licensee has established two control sets or trains of Boraflex coupons. Each train consists of 16, 6.5 x 13 inch coupons, with four levels of four coupons at north, east, south, and west orientations. The four sided coupon trains are lowered into spent fuel rack cells such that the coupons occupy the middle 58 inches of fuel assembly height. The first set is designated as an accelerated exposure coupon train (Train #1) that is repositioned each operating cycle to be placed in a spent fuel rack cell location adjacent to freshly discharged fuel assemblies to reflect a most limiting or bounding degradation analysis due to gamma radiation exposure. The second set is designated as a long term exposure coupon train (Train # 2) that was positioned to a specific spent fuel rack cell location prior to the initial discharge of spent fuel after the first operational cycle and is anticipated to remain in that specific location for the duration of the monitoring program to reflect average Boraflex degradation over an extended period of time. The licensee program requires that a minimum of two coupons from Train #1 (accelerated) be removed and inspected near the end of each operating cycle and that the train be repositioned to its new fuel rack location prior to the discharge of fuel during the ensuing refueling outage. The Train #2 (long term) coupon set is to be inspected at a five year interval. Licensee procedure, MN 0526.12, "Boraflex Coupon Retrieval," provides instruction for the physical removal and reinstallation of the Boraflex coupons and train sets. To date, generic concerns regarding Boraflex degradation include shrinkage, gap formation, thinning, hardening, and erosion. EPRI NP-6159, projected maximum shrinkage to be approximately 4-6% and the maximum cumulative gap size in a storage rack panel was estimated to be 4-6 inches. More recent EPRI sponsored research (EPRI TR-101986, Interim Report, dated February 1993) confirmed that a shrinkage equilibrium is achieved at 3-4% and concluded that reactivity effects of shrinkage and gap formations are very small.

The inspector reviewed the results of the licensee Boraflex monitoring program to date. The licensee has experienced shrinkage of approximately 2-2.5%. The coupons have demonstrated some erosion on the bottom edges and slight increases in weight more than likely due to water absorption, and increased

hardness and thickness. All observations to date have been consistent with generic experience. In response to the NRC Information Notices regarding Boraflex degradation, the licensee in conjunction with Yankee Atomic, performed a spent fuel pool reactivity assessment. The assessment assumed 4% Boraflex shrinkage, 10% Boraflex thinning, and assumed a uniform 4 inch horizontal gap in all the Boraflex material at the midplane of each storage rack. The assessment concluded that the requirement to maintain Keff less than or equal to 0.95 will be maintained with additional "checkerboarding" or alternate cell loading of fuel that has not been fully discharged.

The inspector review concluded the licensee has established an effective Boraflex monitoring program that is consistent with current EPRI guidelines. Additionally, reactor engineering personnel are very well aware of generic experience with respect to premature Boraflex degradation and are effectively implementing the monitoring program. Current coupon inspections indicate that observed degradation at Seabrook is consistent with existing industry experience. The inspector had no questions regarding this issue at this time. This inspector will continue to monitor generic information as it becomes available regarding Boraflex degradation concerns for applicability to Seabrook Station.

5.0 PLANT SUPPORT (71707,71750)

5.1 Radiological Controls

The inspector observed implementation of radiological controls during tours in the radiologically controlled area (RCA). Random sampling of portable hand held friskers and portal monitors demonstrated that they were calibrated as required by station procedures. The inspector determined by observation of several tasks in the radiologically controlled area that the licensee was effectively implementing radiological controls to minimize the spread of contamination and incorporating as-low-as-is-reasonably-achievable principles. Additionally, outage related materials being moved between onsite facilities were routinely observed to have been properly surveyed by radiological protection personnel prior to removal from a controlled location.

5.2 Emergency Preparedness

On September 20, 1995, the licensee conducted an annual medical emergency drill and semi-annual health physics drill. The inspector observed portions of the initial drill notifications. Additionally, the inspector reviewed initial critique notes and the final drill evaluation report dated October 17, 1995. The licensee concluded all drill objectives were demonstrated. Minor comments were recorded regarding receiving hospital staff familiarization with different levels of contamination. Contamination concentrations were discussed with involved personnel and is scheduled to be included in the annual training cycle at the hospital facility. The inspector had no questions regarding the conduct of these drills.

5.3 Security

Throughout the inspection report period, the inspectors noted appropriate compensatory measures being implemented by security force personnel for various doors and barriers that were being opened to facilitate the movement of materials in preparations for the upcoming refueling outage.

6.0 SAFETY ASSESSMENT/QUALITY VERIFICATION (92700)

6.1 Industry Operating Experience

During the current report period, the licensee began disseminating industry operating experience information in the daily plant management meeting. The Nuclear Safety Engineering Group (NSEG) identifies and presents selected industry information. The information is discussed in summary format regarding events at operating facilities for potential applicability and associated lessons learned. The inspector considered that the inclusion of events at operating boiling water reactors (BWRs) demonstrated a strong safety perspective. The inspector considered this recent initiative by senior station management a strength. The daily plant management meeting forum provides a means of communicating valuable industry event information with senior plant management emphasis and support. The inspector noted that the licensee does not formally assign action items or track actions based on the industry lessons learned. The information being communicated at the meetings is for information only and actions taken, if any, are not formal at this time. The inspector had no further questions.

7.0 NRC MANAGEMENT MEETINGS AND OTHER ACTIVITIES (71707,40500)

7.1 Routine Meetings

At periodic intervals during this inspection, meetings were held with senior plant management to discuss licensee activities and areas of concern to the inspectors. At the conclusion of the reporting period, the resident inspector staff conducted an exit meeting on November 6, 1995, summarizing the preliminary findings of this inspection. No proprietary information was identified as being included in the report.

7.2 Other NRC Activities

During the weeks of August 14, 1995 - September 1, 1995, three NRC Region I Operations Specialists conducted an inspection of the licensee maintenance programs. The results of this inspection are documented in NRC Inspection Report No. 50-443/95-12.

During the week of August 21-25, 1995, two NRC Region I Senior Reactor Engineers conducted a routine inspection of the licensee engineering programs. The results of this inspection are documented in NRC Inspection Report No. 50-443/95-10.