UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CHAIRMAN

PDR

November 14, 1996

The Honorable John F. Kerry
United States Senate
Washington, D.C. 20510

Dear Senator Kerry:

I am responding to your letters of September 6 and 12, 1996, in which you expressed concerns about Nuclear Regulatory Commission (NRC) plans to conduct fewer inspections at the Seabrook Station and the Commission's policy of allowing on-line maintenance at Seabrook and other facilities. The Commission recognizes that the issues you raise are of concern to the people of New England since Seabrook is operated by North Atlantic Energy Service Corporation, a wholly-owned subsidiary of Northeast Utilities, which has experienced numerous safety problems at its Millstone and Haddam Neck nuclear plants. I want to assure you that the Commission believes that Seabrook is not experiencing problems similar in nature and scope to those encountered at Millstone and Haddam Neck. Although our comments on the specific issues you raise are based on recent NRC activities at Seabrook, I have enclosed for your information a description of the generic objectives of the NRC inspection and maintenance programs to place our comments in a broader context.

Regarding the issue of reduced NRC inspections at Seabrook, an NRC assessment team composed of inspectors from NRC Region I, the Office of Nuclear Reactor Regulation, the Office for Analysis and Evaluation of Operational Data, and NRC Region IV performed an integrated performance assessment of the Seabrook Station during the periods of January 2-11, 1996, and February 5-16, 1996. The objectives of the "Integrated Performance Assessment Process (IPAP)" were to (1) develop an integrated view of licensee strengths and weaknesses on the basis of an independent review; (2) validate preliminary conclusions about licensee safety performance through an independent, performance-based, on-site inspection; (3) develop inspection recommendations on the basis of the results of the independent review and on-site validation; and (4) develop feedback on the effectiveness of regulatory programs and their implementation. IPAP inspections are performed by teams of senior inspectors who are independent of the day-to-day oversight of the facility being assessed.

On April 3, 1996, the NRC issued Inspection Report No. 50-443/96-80 that presented the results of the IPAP assessment and the inspection team's recommendations regarding changes to the inspection effort. The team recommended continuing the normal inspection effort for the main performance areas of Safety Assessment/Corrective Action and Engineering, and reducing the inspection effort for the performance areas of Operations, Maintenance, and Plant Support. The team's recommendations are summarized in Enclosure 1 of the enclosed IPAP team report.

DF02 1/1

per D Mossburg

Inspection results are integrated periodically (typically every 18 months or less) into an overall evaluation of licensee performance under the Systematic Assessment of Licensee Performance (SALP) program. SALP reports address licensee performance in four functional areas - plant operations, engineering, maintenance and plant support - and assign Category 1, 2, or 3 depending on whether their performance in those areas was superior, good or adequate, respectively. The most recent SALP for Seabrook (June 1996) rated Operations, Engineering, and Plant Support as Category 1 and Maintenance as Category 2. These ratings confirmed the consistently high performance of Seabrook noted in previous SALPs and the IPAP. I have enclosed a copy of the latest SALP report.

The NRC staff has reviewed the recent inspection record to compare the inspection effort expended at Seabrook to the effort expended at other operating reactors. For fiscal year 1991 through the present, the inspection effort expended at Seabrook is consistent with the effort expended at other plants with comparable SALP scores.

On the basis of the inspection record at Seabrook, the IPAP, and the SALP and plant performance review (PPR) results, the NRC staff is confident that the programmatic problems experienced at the Millstone and Haddam Neck plants do not exist at Seabrook and that the number of regional initiative inspections can be reduced. Nevertheless, the staff will continue to assess the situation at Seabrook through implementation of the inspection program, the semiannual PPR, and the SALP process previously described.

With respect to on-line maintenance, the Seabrook on-line maintenance program was developed in April 1995, with initial field implementation in June 1995. During the initial implementation of the program, both the licensee and the NRC identified weaknesses in the planning, work control, pre-maintenance work briefings, and in-field performance. Although individually the weaknesses were not significant to reactor safety, collectively they represented program vulnerabilities that, if not corrected, had the potential to affect reactor safety adversely.

Subsequently, the Seabrook licensee suspended on-line maintenance and conducted an analysis to determine the causes for the program weaknesses and to take corrective actions. Corrective actions have been implemented, and the on-line maintenance program was recommenced in July 1996. The NRC site resident inspectors will continue to inspect the Seabrook on-line maintenance program implementation within the routine inspection program. Additionally, the NRC is planning to conduct a broad-based team inspection to verify compliance with the maintenance rule at Seabrook in early 1997.

I trust that this resolves your concerns about the Seabrook plant. If I can be of further assistance, please contact me.

Sincerely,

Shirley Ann Jackson

Shirley Ann Jackson

Enclosures: As stated

OBJECTIVES OF THE NRC INSPECTION AND MAINTENANCE PROGRAMS FOR NUCLEAR POWER PLANTS

The NRC inspection program is audit-oriented and is intended to verify that the licensee's activities are being conducted properly, the facility is being operated in conformance with the facility operating license and NRC rules and regulations, and that equipment is being maintained properly to ensure safe operations. Through the inspection process, the licensee's activities are monitored and the inspection findings are provided to the licensee's management. Follow-up inspections are conducted to determine whether the licensee has implemented appropriate corrective action.

The NRC inspection program is not intended to replace the licensee's programs or to decrease the licensee's responsibilities. Instead, the NRC program is intended to verify independently the effectiveness of the licensee's programs. On-site resident inspectors are assigned to each nuclear plant on a full-time basis. The activities of the resident inspectors are supplemented by the activities of engineers and specialists from the regional office and Headquarters who perform inspections in a wide variety of technical and scientific disciplines.

The major elements of the NRC inspection program are the core inspections, generic safety issue inspections, and plant-specific regional initiative inspections. The core inspections are required at all plants. The core and generic safety issue inspections constitute an adequate level of inspection at only the few top performing plants in the country; that is, plants with systematic assessment of licensee performance (SALP) Category 1 ratings in most areas. Other plants receive additional plant-specific regional initiative inspections on the basis of their performance in various SALP functional areas.

The NRC inspection program allows NRC regional administrators flexibility in the number, depth, and scope of inspections conducted at plants on the basis of plant performance, while maintaining at least a minimum level of inspections at all plants. Semiannual plant performance reviews (PPRs) provide regional managers an objective performance assessment upon which to base changes to the NRC's inspection plan for each plant. The PPRs are used to adjust the inspection plan on the basis of recent plant performance. The objective information comes from sources such as NRC inspection reports and enforcement actions, licensee event reports (LERs), and performance indicators. The staff identifies and reflects trends or changes in licensee performance in changes to the planned inspections for the licensee's plant.

As it relates to safety, nuclear power plant maintenance consists of those systematic actions performed to ensure the functional reliability of structures, systems, and components (SSCs) important to safety or, in the event of failure, to promptly restore the intended function. Maintenance includes preventive, predictive, and corrective actions.

On July 10, 1991, the Commission's final rule entitled "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," 10 CFR 50.65 (the maintenance rule), was published in the *Federal Register*. This rule, effective July 10, 1996, requires, in part, licensees accomplish the following:

- Establish performance goals for those SSCs included in the scope of the rule
- Monitor the performance or condition of SSCs against these goals
- Take corrective action when goals for an SSC are not met
- Periodically evaluate the goals and monitoring activities and make appropriate adjustments biennially at the least.
- Assess the total effect on plant safety before taking plant equipment out of service for monitoring equipment performance or preventive maintenance.

There is a clear link between effective maintenance and safety as they relate to such factors as the number of transients and challenges to safety systems and the associated need for operability, availability, and reliability of safety equipment. In publishing the maintenance rule, the Commission stated that "to maintain safety, it is necessary to monitor the effectiveness of maintenance, and take timely and appropriate corrective action where necessary, to assure the continuing effectiveness of maintenance for the lifetime of the plant, particularly as plants age." Effective maintenance ensures that design assumptions and margins in the original design basis are maintained and are not unacceptably degraded. Furthermore, performing on-line maintenance in compliance with the maintenance rule is consistent with the NRC's principle of defense in depth. Defense in depth provides for both accident prevention and accident mitigation, with the emphasis on prevention. The NRC staff expects the performance goals established by each licensee to be commensurate with the safety significance of the SSCs and to take into account industry-wide operating experience. The scope of the rule includes safety-related and certain non-safety-related SSCs. Licensees are to consider the results of probabilistic risk assessments and individual plant examinations when establishing the goals. Other analytical techniques are also available and may be used by licensees.

The assessments to determine the total effect on plant safety before performing preventive maintenance are to be performed regardless of plant mode; that is, whether the plant is operating or shut down. The assessment of the cumulative impact of out-of-service equipment on the performance of safety functions is intended to ensure that the plant is not placed in safety-significant (or risk-significant) configurations.

Additionally, the licensee should carefully consider whether the reliability of the equipment is expected to be improved and the overall risk to safe operation of the facility will be decreased by the maintenance. Furthermore, the licensee should be able to justify such an expectation of improved safety. Part of this justification should be based on adherence to the following conservative safety principles (that are part of the NRC Inspection Program Guidance):

1. Performance of preventive maintenance on-line rather than during shutdown should improve safety and be warranted by operational necessity and not by just the convenience of shortening a refueling outage.

2. The licensee should not abuse the allowance to perform preventive maintenance on-line by repeatedly entering and exiting Limiting Condition for Operation action statements.

3. If a piece of equipment is operable but is degraded or is trending toward a degraded condition, the licensee should not remove its redundant counterpart equipment from service for routine preventive maintenance.

4. While performing on-line maintenance, the licensee should avoid performing other testing or maintenance that would increase the likelihood of a transient.

April 3, 1996

Mr. Ted C. Feigenbaum
Executive Vice President - Nuclear
Northeast Energy Service Company
c/o Mr. Terry L. Harpster
P.O. Box 128
Waterford CT 06385

SUBJECT: SEABROOK STATION INTEGRATED PERFORMANCE ASSESSMENT PROCESS INSPECTION REPORT NO. 50-443/96-80 - ONSITE INSPECTION ASSESSMENT RESULTS

Dear Mr. Feigenbaum:

During the period February 5-16, 1996, an assessment team under the direction of Mr. E. Harold Gray and composed of members from NRC Region I, the Office of Nuclear Reactor Regulation (NRR/DRP), the Office for Analysis and Evaluation of Operational Data, and NRC Region IV, performed an onsite assessment of performance at the Seabrook Station. The onsite performance based inspection followed the in-office assessment of January 2-11, 1996. The onsite inspection and assessment was conducted using Inspection Procedure 93808, "Integrated Performance Assessment Process (IPAP)." Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements.

On the basis of docketed information and the information submitted by your staff in response to our request dated December 1, 1995, and findings of the onsite inspection, the IPAP team concluded that the Seabrook Station has significant strengths in the areas of plant operations, maintenance, engineering, security, radiological controls and emergency planning. The team identified a few weaknesses or negative observations that are presented for your review and corrective action as appropriate. The weaknesses include the effectiveness of plant system walkdowns to confirm present conditions including the status of deficient conditions and deficiency tags. A potential violation was identified in the security area regarding access of badged individuals that had not been under the observation program for more than 30 days as discussed in part 5.2.2 of the inspection report. The potential violation will be disposed under separate correspondence. A summary of the assessment findings is contained in the attached inspection report (Enclosure 1), which includes a performance assessment/inspection planning tree.

Enclosure 2 provides the schedule of NRC inspections of your facility planned for the next year. We will inform you of any changes in the content of the plan or any significant changes in the expected dates of these inspections. The routine resident inspector effort is not included in this schedule.

~~9604090179~~ 960403
PDR ADOCK 05000443
G PDR

090083

Enclosure 2

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Original Signed by:

Richard W. Cooper, II, Director
Division of Reactor Project

Docket No. 50-443

Enclosures: 1. NRC Inspection Report No. 50-443/95-15
2. Planned NRC Inspections at Seabrook

cc w/encl:
J. Austin Jr., RAC Chairman, FEMA RI, Boston, Mass.
R. Backus, Esquire, Backus, Meyer and Solomon, New Hampshire
S. Choi, Director, Nuclear Safety, Massachusetts Emergency Management Agency
Commonwealth of Massachusetts, SLO Designee
L. M. Cuoco, Esquire, Northeast Utilities
W. DiProfio, Station Manager
B. Drawbridge, Executive Director of Nuclear Production
R. Hallisey, Director, Dept. of Public Health, Commonwealth of Massachusetts
T. Harpster, North Atlantic Energy Service Corporation
R. Kacich, Northeast Utilities
W. Meinert, Nuclear Engineer
Seacoast Anti-Pollution League
State of New Hampshire, SLO
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
S. Comley, Executive Director, We the People of the United States

Enclosure 1

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Inspection Report:	50-443/96-80
License No.	NPF-86
Licensee:	North Atlantic Energy Service Corporation (NAESCO)
Facility Name:	Seabrook Station
Inspection At:	Seabrook, New Hampshire
Inspection Conducted:	February 5 to February 16, 1996

Team Leader:

E. Harold Gray, Senior Project Manager, Division of Reactor Safety (DRS), Region I

Inspectors:

Norman J. Blumberg,	Project Engineer, Projects Branch 6, Division of Reactor Projects (DRP)
Eben L. Conner,	Project Engineer, Projects Branch 8, DRP
Albert W. De Agazio,	Senior Project Manager, Office of Nuclear Reactor Regulation (NRR), Division of Reactor Projects I/II
Paula A. Goldberg,	Reactor Inspector, Engineering Branch, DRS, Region IV
John R. Jolicoeur,	Reactor Safety Engineer, Emergency Response Branch, Office for Analysis and Evaluation of Operational Data
Edward B. King,	Physical Security Specialist, EP and Security Branch, DRS
Jeff Laughlin,	Emergency Preparedness Specialist, EP and Security Branch, DRS
Ron L. Nimitz,	Senior Radiation Specialist, Plant Support Branch, DRS

Approved: John F. Rogge 4/1/96
John F. Rogge, Chief, Branch 8, Date
Division of Reactor Projects

Areas Inspected:

An Integrated Performance Assessment Process (IPAP) inspection team focused on the areas of safety assessment/corrective actions, operations, engineering, maintenance and plant support including radiation controls, security and emergency preparedness.

Results:

Refer to the Executive Summary.

TABLE OF CONTENTS

EXECUTIVE SUMMARY iii

INTRODUCTION 1

PLANT STATUS 1

ASSESSMENT 2

1.0 SAFETY ASSESSMENT/CORRECTIVE ACTION 2
- Problem Identification 2
- Problem Analysis and Evaluation 4
- Problem Resolution 5
- Conclusions and Recommendations 6

2.0 OPERATIONS 6
- Safety Focus 6
- Problem Identification and Resolution 8
  - Problem Identification 8
  - Problem Resolution 9
- Quality of Operations 11
- Programs and Procedures 14
- Conclusions and Recommendations 15

3.0 ENGINEERING 16
- Safety Focus 16
- Problem Identification and Problem Resolution 17
  - Problem Identification 17
  - Problem Resolution 18
- Quality of Engineering Work 19
- Programs and Procedures 20
- Conclusions and Recommendations 21

4.0 MAINTENANCE 21
- Safety Focus 21
- Problem Identification and Resolution 23
  - Problem Identification 23
  - Problem Resolution 24
- Equipment Performance/Material Condition 25
- Quality of Maintenance Work 26
- Programs and Procedures 28
- Conclusions and Recommendations 29

5.0 PLANT SUPPORT 30
- Radiological Controls 30
  - Safety Focus 30
  - Problem Identification and Resolution 32
  - Quality of Plant Support 34
  - Programs and Procedures 36
  - Conclusions and Recommendations 37

TABLE OF CONTENTS (Cont.)

Security 38
Safety Focus 38
Problem Identification/Resolution 39
Quality of Plant Support 40
Programs and Procedures 41
Conclusions and Recommendations 42
Emergency Preparedness 42
Safety Focus 42
Problem Identification and Resolution 43
Quality of Plant Support 44
Programs and Procedures 46
Conclusions and Recommendations 46
Plant Support Overall Conclusion 47

CONFORMANCE OF THE PLANT AND PRACTICES TO THE UFSAR 47

ATTACHMENTS
1 Performance Assessment/Inspection Planning Tree
2 Documents and Information Reviewed In-Office
3 Personnel Attending Exit Meeting

EXECUTIVE SUMMARY

SEABROOK STATION

NRC INSPECTION REPORT NO. 50-443/96-80

This inspection was conducted using Inspection Procedure 93808, "Integrated Performance Assessment Process." The inspection began with an in-office period which involved a documentation review and assessment of performance by the team. The results of this in-office assessment were contained in an NRC letter to Seabrook dated January 23, 1996. This in-office assessment formed the basis for preliminary conclusions regarding inspection recommendations using a performance assessment/inspection planning tree. Following the in-office inspection period, the team conducted an inspection onsite. After this onsite inspection period, the team finalized the inspection recommendations and the planning tree. The inspection recommendations are contained in the body of the report.

Overall, the team found that the licensee had been effective in identifying problems and was usually effective in resolving problems.

Safety Assessment/Corrective Action

The team concluded that there was an effective program for identifying and resolving problems at Seabrook. However, a few problems still existed with the effectiveness of the corrective actions as indicated by some repetition of equipment problems and personnel errors, and corrective actions were not always completed in a timely manner. The licensee had made significant progress toward establishing a program for self-assessment, and many of the self-assessments were of high quality. There was good management oversight of the corrective action process and the program for reviewing operating experience throughout the industry was effective.

The team recommended a continued normal inspection effort for the area of Safety Assessment and Corrective Action. The team recommended that inspection efforts monitor the effects of any changes to the corrective action process resulting from the recent corporate reorganization and reengineering.

Operations

The licensee demonstrated appropriate safety focus regarding equipment problems and normal operations, and had appropriate management involvement in establishing daily priorities and for participating in decision making. The licensee exhibited good problem identification capability through normal evolutions and self-assessments. However, for problem resolution, although the licensee was maintaining the plant in good condition, the large number of open items was considered a vulnerability. The quality of operations was very strong as evidenced by strong operations management, good control room communications, log keeping and shift turnovers, quality use of the training simulator, and thorough response to the Generator Stator Cooling problem. The licensee's programs and procedures were generally good and effectively used. However, the poor tracking of the master tagout status was a weakness.

Overall, the team recommended that NRC inspection of the operations area be reduced except for the areas of problem resolution and programs and procedures.

Engineering

The positive safety focus, knowledge, stability and experience level of both design and system engineers and their involvement with the plant were notable strengths. The team identified some negative observations for licensee review and corrective action as appropriate. These included: the current program at Seabrook did not require the system or design engineers to visit the UFSAR requirements periodically; there was a lack of specific requirements for the system engineer to perform periodic walkdowns; and recurring equipment problems, such as corrosion in the primary component cooling water heat exchanger tubes and the vibration and alignment problems in the diesel generator, that had not been fully resolved. In general, engineering work products were found to be of high quality and supportive of plant operations. An exception to this was noted in the calculation of the thermal power level setpoints with inoperable main steam safety valves. The system engineer trending program was considered a strength. The engineering programs and procedures were well developed.

Overall, the team concluded that the performance of design and system engineering was very good. The team recommended a continued normal inspection effort for the area of engineering and that inspection focus on problem resolution.

Maintenance

Overall, the material condition of the plant was found to be very good. Maintenance technicians were well qualified to perform their assigned tasks and specific qualifications were properly maintained and tracked. Planning and scheduling was a strength. Maintenance work packages were found to be comprehensive and useful to the maintenance workers. The "System Week" process provided a useful mechanism to focus attention of plant departments on a system and safely work on deficiencies, system by system, while minimizing the impact on plant operations. There was excellent safety focus on maintenance activities in the planning process. Probabilistic Risk Assessment engineers, safety and reliability engineers and senior reactor operators participated in system week planning. In addition, licensed reactor operators were included in the planning process and system engineers approved work orders and repetitive task sheets except for very minor maintenance. Both the preventive and predictive maintenance programs were strong and effective.

There were some weaknesses identified. Errors were noted in the deficiency tag system. The team observed that sometimes deficiency tags were not removed even after the work was completed. A followup audit by the licensee found additional deficiency tags not cleared and some deficient items in the plant identified by deficiency tags were not placed in the work order system. The procedure upgrade program was behind schedule and the anticipated December 1998 completion date may not be met. Although processes were in place to assure that UFSAR commitments were being met, there was a lack of emphasis on using these processes. The on-line maintenance process was unworkable and was stopped by the licensee. It needs to be improved before it is tried again. A

repetitive problem with the foreign material exclusion procedures was experienced.

In summary, the team recommended that NRC inspection of the maintenance area be reduced except for the areas identified above.

Plant Support

- Radiological Controls

In the area of radiological controls (i.e., radiation protection and radioactive waste management, storage and transportation), the team concluded that the overall quality of programs and procedures was good but a need for enhanced development and definition in the radioactive waste management, storage, and transportation programs was noted. The licensee exhibited generally very good safety focus in the area of radiological controls. The team noted very good inter- and intra-departmental communications. Staffing was stable and coordination with other station departments was generally very good. Radiation protection representatives were aware of planned work, and generally effective radiation exposure minimization efforts were implemented, however ALARA exposure reduction planning over the life of the station was not routinely performed. The radioactive waste minimization program was a notable strength. Management oversight was generally very good. The problem identification and resolution programs were generally effective but weaknesses noted in the areas of radioactive waste management, storage, and transportation indicated an apparent need for increased attention to these areas. The team recommended normal inspection effort in this area with increased emphasis in the area of radioactive waste management, storage, and transportation.

- Security

Overall, the team concluded that the security program was strong. Management support was evident through continual program improvements and enhancements. Problem identification and resolution were generally effective. However, a weakness noted in the area of access authorization warrants the implementation of effective corrective actions. Procedures were well written and satisfied the requirements of the Security Plan as approved by NRC and the security force members were knowledgeable of their duties and responsibilities. The team recommended reduced inspection effort for the security area.

- Emergency Preparedness

Overall, the team concluded that the emergency preparedness program was strong. There was a stable, experienced staff and excellent management involvement. Problem identification and resolution was effective. Facility inventory control, which had been a recurring weakness, was much improved. One area which merited further licensee attention was the offsite communication system vulnerability to a severe natural event. The team recommended reduced inspection effort for the emergency preparedness area.

DETAILS

INTRODUCTION

In an effort to better integrate and assess licensee performance, and to better utilize inspection resources, the NRC has initiated the Integrated Performance Assessment Process. This process is described in Inspection Procedure 93808, "Integrated Performance Assessment Process (IPAP)." A team of NRC personnel not normally associated with routine inspection activities at the Seabrook Station was assembled. This team developed an integrated perspective of licensee strengths and weaknesses based upon a review of historical NRC documents and licensee provided information.

During the period February 5-16, 1996, the IPAP team performed an onsite assessment of performance at the Seabrook Station. The onsite performance based inspection followed the in-office assessment of January 2-11, 1996. On the basis of docketed information and the information submitted by the Seabrook staff in response to our request dated 12/01/95 and findings of the onsite inspection, the IPAP team concluded that the Seabrook Station has significant strengths in the areas of plant operations, maintenance, engineering, security, health physics and emergency planning. The team identified a few weaknesses or negative observations that are presented for licensee review and corrective action as appropriate.

The onsite review results, in terms of future NRC inspection effort, are visually displayed in Attachment 1, "Performance Assessment/Inspection Planning Tree, Assessment of Licensee Performance."

PLANT STATUS

As the team arrived at Seabrook for the onsite inspection, the licensee was trouble shooting and resolving a problem with the turbine generator stator cooling (GSC) system. This evolving condition provided a problem resolution sequence involving operations, maintenance, and engineering that was observed by the team.

The licensee had operated the GSC system in a low dissolved oxygen state since the initial startup of the generator with a normal GSC system flow of 705 gallons per minute (GPM) with one GSC pump running. Following the return to power operation after the operations refueling outage (ORO-4) excess oxygen was introduced into the GSC system. A "feed and bleed" recovery procedure was initiated which resulted in a copper oxide flaking followed by a significantly reduced GSC flow. The GSC flow decrease was almost 200 GPM below normal. Previous inspections of GSC components (piping, filters, strainers, and resin) had always indicated the presence of cuprous (red) oxide when the nominal oxygen was at about three parts per billion (ppb). Now, however, inspection of the demineralizer filter (the only strainer/filter that can be changed out at power) indicated the presence of cupric (black) oxide with the oxygen in the parts per million (ppm) range. Copper corrosion data indicated that operation with either low oxygen concentration (below about 100 ppb) or high oxygen concentration (above one ppm) had acceptable corrosion rates. However, with oxygen at about 500 ppb, the oxygen concentration following the feed and bleed operation, the copper corrosion rate was greatly increased. The

licensee increased the monitoring of critical parameters (oxygen, copper, conductivity, etc.) as a part of the problem resolution process.

General Electric (GE), the turbine and support system designer, had recommended in a September 16, 1993, Technical Information Letter (TIL) 1098-3R1, Inspection of Generators with Water Cooled Stator Windings, that users of their generators operate the GSC system oxygenated to a range of two to eight parts per million (ppm). GE pointed out that this level of oxygen was favorable for the formation of a tough, tenacious and stable cupric oxide film on the inside surfaces of the stator winding, protecting the copper from erosion and excessive corrosion. Although the licensee had considered changing to this mode of GSC operation, no change had been made prior to the reduced flow problem.

Having made the transition from operation at low oxygen (cuprous oxide mode) to high oxygen (cupric oxide mode), the licensee made the decision to operate the GSC according to GE's recommendations. This involved a Temporary Modification (TMOD) request for continuous injection of air into the GSC surge tank, Temporary Setpoint (TSP) request for resetting the automatic turbine run-back on GSC low flow several times as system flow changed, and various procedure and drawing changes. During the team's two week onsite inspection, GSC flow continued to decrease down to about 520 gpm (normal flow above 700 gpm) with one pump running. The licensee attributed the reduced flow to a buildup of corrosion products in the stator cooling tubes. At the conclusion of the team inspection, the licensee was considering an on-line chemical flush, developed in Switzerland, using EDTA (ethylene-diamine-tetra-acetic, di-sodium salt). The team learned, after the close of the inspection, that this chemical flush successfully restored GSC flow to normal and the plant has returned to full power operation.

The team reviewed various aspects of the licensee's handling of the GSC reduced flow problem, including management involvement, engineering support, and the adequacy of modification packages, procedure, and drawing changes. Overall, as addressed in the Operations and Engineering sections of this report, the team found the licensee's actions to resolve the generator stator cooling reduced flow condition to show a careful, methodic approach to problem resolution.

ASSESSMENT

1.0 SAFETY ASSESSMENT/CORRECTIVE ACTION

1.1 Problem Identification

The team conducted an in-office review and assessment of NRC documents relevant to the licensee's programs for reporting problems and corrective actions, performing self-assessments, and conducting independent assessment activities. The team's preliminary conclusions were that the formal reporting processes were a strength, and although some departments had established self-assessment programs, there was a lack of consistent application throughout the organization and there was no formal site-wide program guidance for conducting self-assessments. Independent oversight activities conducted by Quality

Programs, the Station Operation Review Committee, and the Nuclear Safety Audit and Review Committee appeared to be effective. The team's preliminary conclusion was that NRC inspection in this area could be reduced.

During the onsite period, the team reviewed the licensee's process for reporting problems and documenting corrective actions, observed daily site meetings, reviewed quality assurance audits, and reviewed the self-assessment program including numerous self-assessments. Additionally, the team interviewed some of the licensee's staff involved with these activities.

The team found that the licensee's program for identifying and reporting problems continued to be a strength. The licensee established a corrective action process which used a single document (Adverse Condition Report) to identify significant adverse conditions and to document the cause and the corrective action taken. The daily meetings of the Occurrence Review Committee to review new Adverse Condition Reports (ACRs), screen work requests, and review the completed ACR evaluations and proposed corrective actions was a strength. The team noted that the meetings were well run and the members were prepared and knowledgeable about the issues to be discussed. The committee discussions assured that adverse conditions being reported met the reporting threshold, that the problems to be corrected were properly and adequately defined, and preliminary causes were identified.

The licensee's ACR process captured only those conditions that met or exceeded the thresholds specified by procedure for reporting. Less significant conditions, which did not rise to the threshold levels, were reported through a variety of other lower-tier documents, and the line organizations maintained separate tracking and trending databases for these issues. The team observed that this tended to make the overall scheme for problem identification and resolution complicated and difficult to understand. However, the team did not identify any specific weaknesses associated with this observation.

The Supervisory Walkdown process was a strength. The team found that this process resulted in the identification of many industrial safety, housekeeping, and work-related issues or problems. In addition, many of the conditions were corrected immediately, and most of the recommendations made by the assigned walkdown supervisors had either been implemented or were planned for implementation.

The team found that the licensee made significant progress toward establishing a site-wide self-assessment program. The team found that several of the line organizations had made excellent use of the self-assessment process in preparation for, during, and subsequent to the 1995 refueling outage. A notable application of Self-Assessment was the Maintenance Department's Self-Assessment of the progress made to implement the requirements of 10 CFR 50.65 (The Maintenance Rule). A team composed of licensee and industry representatives performed the assessment.

Based on this inspection, the team recommended that NRC reduce inspection effort in this area.

1.2 Problem Analysis and Evaluation (Safety Assessment/Corrective Action)

The team conducted an in-office review and assessment of NRC documents relevant to the licensee's programs for trending and evaluating identified problems, equipment performance trending, and root-cause evaluation. The team's preliminary conclusions were that the licensee's programs for identifying problems and evaluating trends was strong. Contributing to this performance was the strength of the System Engineering function, effective use of computer resources, and the Corrective Action Program. The team found that the program for root-cause evaluation appeared to be good, but a few repeat occurrences indicated some failures to determine the correct root causes. Independent review organizations were effective, but could be improved.

During the onsite period, the team reviewed monthly and quarterly trend reports, attended Station Operation Review Committee meetings, performed a system walkdown with system and design engineers, reviewed the spent fuel pool cooling system, and reviewed planned modifications to the component cooling water and spent fuel pool cooling systems.

The corrective action process provided information to prepare trend reports used by management for evaluating performance. The trend reports helped focus management's attention upon those areas where improvement was or is needed. The team reviewed monthly and quarterly trend reports which presented various corrective action data in various tabular and graphical forms along with evaluations and interpretations of the data. The reports also compared selected statistics to predetermined goals. The corrective action process was revised at the beginning of 1995, when the single corrective action document (ACR) was instituted. Much of the data in the trend reports relied upon Occurrence Review Committee initial reviews of ACRs (vice awaiting the final evaluation) to assure timely identification of issues and trends. The trend reports showed that the initial determinations were quite good and could be relied upon for trending. The team observed that trend reports showed that in nearly all cases, the goals were missed early into the trending period raising the concern that the set goals may not be realistically attainable. The evaluations and interpretations presented in the trend reports were self-critical and the reports were clearly written. The team concluded the program for trending and evaluation was a strength.

The Station Operation Review Committee was observed providing a review of proposed changes to station-generator runback setpoints and a review of calculations for which a particular computer code was used to determine if safety-related evaluations were adversely impacted. The team concluded that the Station Operation Review Committee reviews were thorough.

The team performed a walkdown of the spent fuel pool cooling system with system and design engineers. The engineers were knowledgeable of the status of the design and performance of the system. The system engineer regularly used data trending capability to capture real-time data of various system operating parameters via a local area network (LAN/plant) computer interface to monitor system performance. No discrepancies between the Updated Final Safety Analysis Report (UFSAR) and the spent fuel pool cooling system configuration were found.

Based on this inspection, the team recommended normal inspection effort be continued for this area.

1.3 Problem Resolution (Safety Assessment/C .rective Action)

The team conducted an in-office review and assessment of NRC documents relevant to the licensee's programs for corrective action, managing commitments, and reviewing industry operating experience. The team's preliminary conclusions were that the licensee's corrective action process had the elements for an effective program, but was not fully effective in preventing repeat occurrences. The team concluded that the licensee's process for managing commitments was very good, but the backlog of commitments was large, and that the program to review industry experience appeared to be effective.

During the onsite period, the team reviewed corrective action trending data, the Action Information Tracking and Trending System (AITTS) for managing commitments, and the Operating Experience Review program, and interviewed some of the licensee's staff involved with these activities. AITTS is a computer-based system used by Seabrook and the four other Northeast Utility nuclear units used to track five categories of items. The system was used in a manner that assured that no assignment for an item could be made to a department without that assigned departments acceptance of the work and the completion schedule. The system also assured that reassignment or rescheduling could not be done without the agreement of the original assigner. The system has been in use since mid 1994, and appeared to be effective for managing issues at Seabrook.

The licensee's corrective action system was revised at the beginning of 1995, but most of the elements of the program were already in place. Trending data indicated that the problems noted in the in-office reviews still existed in that there were still repetitive equipment failures, such as the diesel generator bolting issue, and some of the personnel errors were repetitive. The Occurrence Review Committee's (ORC's) rejection rate for completed ACR evaluations indicated a high rate of rework for inadequate evaluation or corrective action. In addition, the number and age of open ACRs indicated that timeliness was a continuing problem. The team found the good reviews of corrective action activities by the ORC to be a strength.

The team reviewed the licensee's program to apply industry experience and communications. The large backlog of open items, about 300 in the third quarter of 1994, had been reduced by nearly three quarters to about 80 in 1996. All of these had received a preliminary screening for significance. Industry events were discussed daily at the Station Director's morning meeting to alert managers of potential applicability to Seabrook. The team reviewed selected files and observed that the issues were reviewed for applicability, and where applicable, detailed review and recommended actions were provided. All industry experience communications were entered into AITTS for tracking and scheduling. The team concluded the program was effective.

Based on this inspection, the team recommended that NRC continue normal inspection effort for this area.

1.4 Conclusions and Recommendations (Safety Assessment/Corrective Action)

The team concluded that there was an effective program for identifying and resolving problems at Seabrook. However, a few problems still existed with the effectiveness of the corrective actions as indicated by some repetition of equipment problems and personnel errors. Corrective actions were not always completed in a timely manner. The licensee had made significant progress toward establishing a program for self-assessment, and many of the self-assessments were of high quality. There was good management oversight of the corrective action process and the program for reviewing operating experience from the industry was effective.

The team recommended normal NRC inspection effort be continued for the area of Safety Assessment and Corrective Action. The team recommended that inspection efforts monitor the effects of any changes to the corrective action process resulting from the recent corporate reorganization.

2.0 OPERATIONS

2.1 Safety Focus

Based on the in-office review of NRC and licensee documents relevant to operations, the team found the licensee's performance was mixed. Strengths were good overall control of operations and maintenance activities. Examples include a manual trip of the reactor following loss of both electro-hydraulic control pumps, using "work arounds" to minimize challenges to operators and promote nuclear safety, appropriate consideration of probabilistic risk assessment data in scheduling work and providing adequate redundancy of safety-related equipment, and the reduction in the number of licensee event reports (LERs). Weaknesses related to exceeding the licensed power level, the inadvertent heatup of the spent fuel pool, lack of focus following the manual reactor trip due to loss of both electro-hydraulic control pumps, recurring tagging problems due to 1994 outage changes, and lack of time and manpower to plan and review these changes.

The team used insights gained during the in-office review to plan the onsite inspection activities. These inspection activities included an evaluation of the past and present operating decisions including power level control, on-line maintenance, work arounds, the use of probabilistic risk and events. Management control of operations including tagging, staffing, and technical and safety reviews were also evaluated.

During the onsite inspection, the team noted that one of the strengths at Seabrook was the stable staff and large number of licensed senior reactor operators (44) and reactor operators (21). In addition to staffing six rotating shift crews, the licensee used licensed individuals as on-shift Work Control Coordinators (WCCs), in planning and scheduling, training, and other positions of leadership at the plant. Licensed reactor operators were used, in addition to shift positions, in work control and as coordinators for the on-shift procedure work. These uses of its licensed staff added depth in understanding plant operations to supporting functions and was considered to be a strength by the team.

In October 1995, the reactor was operated twice just slightly above the licensed rated thermal power of 3411 Mwt. These events were originally addressed in the resident Inspection Report 50-443/95-13. The team reviewed the events to determine the licensee's safety focus and corrective actions. The first event occurred when operators increased power following an indicated reactor power decrease when a steam flow transmitter was calibrated. Onsite, it was learned that the steam flow transmitter calibration was an early on-line maintenance activity performed during a boron dilution. The plant response appeared to be normal for the boron change being made. Corrective actions included having the I&C technicians inform plant engineering as well as operations when critical calibrations were performed, and having operations change from controlling power level based on the computer calculated eight-hour average to controlling on a one-hour average.

The second event occurred following a restart of the Main Plant Computer System (MPCS) when the calorimetric calculation defaulted to the steam flow mode, which had not been normalized following the first event. The corrective action was to revise the controlling procedure, ON 1251.01, Revision 5 - Change 5, Loss of the Plant Computer, to verify the MPCS calorimetric status during computer restart. The MPCS computer group initiated a new procedure, CEDI-16, Revision 0, MPCS Operability Checklist. This new procedure requires a review of the calorimetric display with the Unit Shift Supervisor and verification that its mode is correct. The team found these corrective actions acceptable to prevent exceeding the normal power level limit.

During the 1994 operations refueling outage (ORO-3), a recurring tagging problem was identified by the NRC and by the licensee. The team reviewed the operations manager's ORO-4 Report (provided ORO-3 corrective actions and plans for improvements for the ORO-4 outage) and the draft QA's Integrated Assessment Report of ORO-4. Corrective actions included operations supplying a licensed SRO master tagout (MTO) coordinator and two licensed Ros to assist in the process. The licensee added on-shift Work Control Coordinators (WCC) to assist in work control and tagging. In addition to the increased staffing, procedures that were deemed critical or had resulted in earlier problems were rewritten in the new procedure upgrade (PUP) format. Although the total number of tagging errors was less during ORO-4 than for the ORO-3 outage, the daily number was, according to QA, actually greater. The licensee said that this was due in part to lowering the reporting threshold for the ACRs so less significant issues were captured and the resultant lessons learned.

In 1995, the licensee identified a significant number of preventive maintenance and corrective maintenance items that could be completed at power. The on-line maintenance (OLM) directives, as defined in North Atlantic Management Manual (NAMM) 3.6, Policy on OLM, and Seabrook Station Management Manual (SSMM) Chapter 2, Section 18.2, OLM Policy, were developed and procedures written. After the initial OLM performance did not meet expectations, operation's management stopped OLM just prior to the 1995 outage to provide for analysis and improvement of the process. The probable cause was identified to be a lack of planning. Operations stopping the OLM program for plant and personnel safety reasons and the involvement of licensed individuals to help in planning, scheduling, and work control were considered strengths.

The team reviewed the licensee's Operational Impact Items (OII) program (similar to Work Arounds at other plants) controlled by Operations Administrative Instruction (OAI) 01.A. OIIs were normally identified by operations personnel and then reviewed by the shift manager, operations technical projects group, and operations manager. The status and closeout of OIIs were controlled by the operations technical group. There were 32 items on the latest list with 10 prioritized high and the rest unprioritized. The team's review found no safety issues on the operational impact items listing and concluded that the program was appropriately managed.

A team goal was to determine the use of probabilistic risk assessment (PRA) in each of the functional areas being inspected. The NRC Office of Nuclear Regulatory Research had briefed the team in regards to the Seabrook IPE/PRA program. The licensee's computer printout of PRA ranking showed good agreement with the NRC ranking. The team found that operations personnel were well aware of PRA conditions and the risk assessment staff was involved with work planning for on-line maintenance and for outage work planning.

Overall, the licensee demonstrated appropriate safety focus regarding equipment problems, normal operations, and had appropriate management involvement in establishing daily priorities and in participating in decision making. Based on this inspection, the team recommended that the NRC reduce inspection effort in the area of safety focus.

2.2 Problem Identification and Resolution (Operations)

2.2.1 Problem Identification (Operations)

Based on the in-office review of NRC and licensee documents relevant to operations, the team found the licensee's performance was acceptable. Strengths were identifying reactor coolant leakage and taking proactive actions in tracing the source, locating a feedwater isolation valve that had a hydraulic oil control circuit problem, achieving an alarm free main control board, monitoring and evaluating the generator exciter centrifuging epoxy, and finding that the main steam safety valve testing may be nonconservative per Westinghouse. In addition, the identification of numerous conditions not meeting the technical specifications (TS) surveillance requirements were strengths. However, weaknesses related to not finding the TS problems earlier were noted. For example the PCCW pump room areas' temperature not being adequately performed resulted from a nonconservative temperature switch setting being used. The root cause was the use of unapproved documents to obtain the setpoints. The negative aspect of finding conditions that do not meet TS surveillance requirements was that other undiscovered issues, with undetermined consequences, may possibly exist.

The team used insights gained during the in-office review to determine the onsite inspection activities. These inspection activities included the review of the problem identification process, self-assessment findings, and negative aspect of finding any conditions that did not meet TS requirements.

During the onsite inspection, the team observed strong communications within the operations department at all levels. Operations management was noted in

the control room on a regular basis, the shift manager on days routinely attended meetings of importance, and shift managers were observed briefing their staffs following shift changes, upon return from meetings, and ahead of planned plant changes. The Assistant Operations Manager was involved with one of the shift's Wednesday simulator quizzes and the Operations Manager routinely met on Wednesdays for breakfast with the operators coming off the midnight shift. Other techniques for enhancing communications were Talk to the Operations Manager program, and Deficiency Tag, Adverse Condition Report (ACR), Procedure and Form Change Request, Request for Engineering Services, Training Development Recommendation forms. The licensee had lowered the threshold for reporting incidents. For example, before ORO-4, 200 to 300 ACRs were submitted per year. Now the submittal rate was more than 500 per year.

At the start of the team inspection, about 35 deficiency tags were noted and the licensee was requested to confirm the status in the computer tracking system. Of the total number of deficiency tags checked, about half had some problems. Follow-up of this issue was performed by the team and is reported in the Maintenance section of this report.

During the in-office review, the team was concerned about the number of LERs reported at Seabrook. Operations management stated that the number of LERs was decreasing during their review of the plant operating bases including the procedure update program. The team found that the licensee was identifying and correcting plant problems in a timely manner.

Overall, the licensee exhibited good problem identification capability through normal evolutions and self-assessments. Based on this inspection, the team recommended that the NRC reduce inspection effort for operations.

2.2.2 <u>Problem Resolution (Operations)</u>

Based on the in-office review of NRC and licensee documents relevant to operations, the team found the licensee's performance was adequate. Strengths were effective review of the containment sump isolation valve inoperability, correction of the malfunctioning RCCA system, and elimination of two nuisance control room alarms. Weaknesses were two minor errors in the operating logs for emergency diesel generators, unrestrained temporary equipment in the control room, management follow-up to the letdown system isolation, and operators' response to an RCCA deviation monitor alarm.

The team used insights gained during the in-office review to determine the onsite inspection activities. These inspection activities included the evaluation of outstanding work issues, adequacy of control room logs, and management oversight of operations.

During the onsite inspection, the team attended a number of information, discussion, and SORC approval meetings on the generator stator cooling (GSC) low flow problem. These meetings were well attended, had excellent presentations and good discussions, and resulted in reasonable decisions and courses of action. The team also reviewed TMOD 96-0007, Introduction of Oxygen into GSC System, February 2, 1996, Procedure Change Request for OS1231.03, Turbine Runback/Setback, February 5, 1996, TSP 96-0002, Revision 3,

GSC Low Flow Setpoint Change, February 10, 1996. These documents were well written with good safety evaluations. The team noted that the GSC subsystem was mentioned in the UFSAR, in regards to a turbine runback that reduces power to 22 percent. However, the wording, "Failure of the Stator Cooling Water System initiates a unit power runback ..." was incorrect since it was low flow instrumentation that generated a turbine runback. The licensee stated that TMOD bases were not considered for UFSAR changes, but this change will be considered when the modification is made permanent. The team concluded that appropriate operational management attention was directed toward resolution of the generator stator cooling problem and conservative oper.ional decisions were implemented.

The team reviewed the computer listing of temporary modifications (TMODs) provided by the licensee. This listing showed 44 TMODs, some dating back to 1986, were still active. TMODs were made at Seabrook for changes in systems, structures, and components in accordance with Procedure MA 4.3, Temporary Modifications. The team discussed the age and duration of the TMODs with the licensee. The licensee agreed and stated that TMOD corrective actions were the responsibility of engineering and operations will be discussing the outstanding TMODs with engineering.

The team selected seven safety-related TMODs to review in detail. The technical evaluations were acceptable and procedure changes were made as required. However, the team had concerns with some drawing updates. Procedure MA 4.3 requires that TMODs affecting operations critical drawings (Category 1 and 2) be identified on controlled copies of the drawings for the control room and other critical locations. Some of the TMOD changes were indicated on the affected drawings as redlined markups, others were stamped indicating a TMOD change had been made but the drawing was not red-lined. For TMOD 95-0003, Interface Selected Electro-Hydraulic Control (EHC) Signals to the Main Plant Computer (MPC), the cover page said electrical drawing NHY-310237, Sheet B-34 was affected. However, this drawing only had sheets up through B-33. The licensee was requested to resolve this issue and provided a written response just before the inspection ended. Their response was that sheets up through B-33 were classified as Category 1 and 2 drawings, whereas Sheet B-34 was a Category 3 drawing which was not fully implemented at that time. Apparently, drawings with "B" designations were not Category 1 or 2 drawings like the system drawings. For the latest temporary modification, TMOD 96-0007, Providing for the Introduction of Oxygen (Air) into the Generator Stator Cooling (GSC) System, dated February 2, 1996, the drawing changes had not been made, but were made in the team's presence. The licensee provided a copy of ACR 95-461, Drawings in the Control Room Do Not Reflect TMOD Installations. This ACR listed several TMODs where affected drawings were not updated as required. Corrective actions were taken by the licensee.

In addition to temporary modifications, the licensee used temporary setpoints (TSPs). Of the 89 opened since initiation of the TSP program, only five remained open at the time of this inspection. The team reviewed the open TSPs in detail. The latest TSP, No. 96-0002, was to change the turbine run-back on low generator stator cooling flow from the normal setpoint of 600 gpm to values of 572, 350, and 490 gpm, decreasing, as Revisions 1, 2, and 3,

respectively. These TSP changes had strong technical evaluations and were well written.

The team reviewed a 1995 quality assurance audit of the temporary modification (TMOD) process, QASR 95-00004. This audit was critical of signature authority, detailed training required, inappropriate configuration, combining the temporary modification with temporary setpoint procedures, overlooked documentation, improper classification, and unsupported documentation. The licensee's corrective actions included revision of TMOD Procedure SSMA 4.3. Although most of the corrective actions were assigned to engineering, operations had findings related to signature authorities and training requirements. The team found the audit to be of good quality with appropriate corrective actions.

Temporary modifications also called for operating procedure changes as necessary. The same TMODs were checked to see if the specified procedures were properly updated. No problems were identified. During this review, it was noted that only a few operating procedures needed revisions. This excluded the procedure upgrade program discussed later in this report. The team concluded that although a large number of long standing TMODs were active, drawings and procedures reflected the changes made and good assessments of the program had been performed. Operations management stated that they would pursue an initiative with engineering to reduce the TMOD backlog.

The team also reviewed the current listing of 41 requests for engineering support (RES) submitted by operations. Operations management informed the team that the highest priority RES issues were on the Operational Impact Items list to be completed first. The team reviewed the latest Station Modification Resource Committee (SMRC) meeting report. This committee, with representatives from operations, sets the priorities for future work for repairs and system upgrades, both outage and non-outage. The total of all engineering backlog items (RESs, DRRs, DCRs, and MMODs) was about 350 at the time of the onsite inspection with RESs being the largest contributor.

Overall, the team concluded that while the plant is being maintained in good condition at this time, delay in correcting the large number of open TMODs, RESs, DRRs, DCRs, and MMODs may cause problems in the future. Based on this inspection, the team recommended that NRC increase inspection in the area of problem resolution.

2.3 Quality of Operations (Operations)

Based on the in-office review of NRC and licensee documents relevant to operations, the team found the licensee's performance was generally good. Strengths included the operator training and requalification programs, job performance measure administration, plant operator performance during both routine and emergency operations, operator attentiveness to plant status including control room alarms, strong command and control supervision during reactor startup following an unplanned manual reactor trip, strong operator support of the service water pump fastener replacement, and positive performance during a lowering steam generator water level event caused by a

failed steam flow instrument. Other strengths included good use of the loose parts monitoring system, mostly excellent refueling outage work, good performance on "walk arounds," operator and plant management's handling of an increasing reactor coolant pump seal leak-off trend and resultant early shutdown for the third outage, and operator handling of the Tewksbury transmission line problem.

Weaknesses included the simulator change backlog, simulator communications, and control board attentiveness during scenarios, some operators were complacent about shift turnovers, attention to detail as a problem indicated by the personnel hatch event, three operators' errors during the refueling outage, training programs not having full participation of workers and of management, no status tracking of the engineering support personnel (ESP) training programs, tagging issues needing operations management attention, Senior Reactor Operator (SRO) candidates tending to over classify and not prioritize restoration of events involving loss of busses E5 and E6, one simulator board operator not giving the SRO the information explicitly asked for, configuration control and conflicting guidance issues during the Tewksbury transmission line problem.

The team used insights gained during the in-office review to determine the onsite operations inspection activities. Activities selected for review included the operation's department performance during the last outage and during normal and abnormal operations and the simulator change backlog and effectiveness.

During the onsite inspection, the team noted strong plant leadership by operations. This was especially apparent in operations response to the GSC problem where increased monitoring was required by the control room staff and the nuclear system operators (NSOs). A long-term strength was the licensee maintaining the control alarm monitors in a normal blackout status. At the start of the inspection, this was not the condition due to the low power (approximately 40 percent) caused by the GSC flow problem. Later in the inspection as power level was increased as GSC conditions stabilized, the alarm monitors cleared.

The team observed control room communications, log keeping and shift turnovers. Communications among the control room staff as well as with plant and operations management, maintenance personnel, and system engineering were very good. Control room logs were kept via a computer for the shift manager and unit shift supervisor, and in a log book for the supervisory control room operator. The team's review concluded that control room log keeping was very good. The team accompanied two NSOs on their daily roving plant tours. When the team questioned why diesel generator starting air tank pressures were not listed on the NSO Log, the operations department immediately took corrective action and added these readings to the log. The team observed as many detailed shift turnovers as possible. Although not all shifts were observed, the turnovers watched were very thorough and the guidelines provided in Operations Management Manual, Chapter 4, Shift Relief and Turnover, were followed. The team also noted a strong individual pride in the company, in doing a good job, and in the way plant operations performed.

During the onsite inspection, the team observed various levels of operations management communicating with control room operators and other plant personnel. Operations management demonstrated strong involvement in daily operations by a recent initiative to improve communications by changing the six-crew organization. Although some of the operators missed working with old friends, none of the operators interviewed by the team thought the crew swaps was a bad idea. This practice was to be continued on a frequency of about one per year according to the licensee.

The Operations Manager, the Assistant Operations Manager and/or other staff visited the control room every morning and as needed during the day. Almost daily, the Assistant Operations Manager provided written Information Notes including technical clarifications, industry events, heads-up notes, etc. These notes, noted as very positive and challenging, were well received by operators. A good example of this was the Note of February 1, 1996, where the Assistant Operations Manager complemented the crews for good conservative decision making on reducing the plant load the previous night for GSC problems, restated safety conservatism, attached a Wolf Creek trip event, requested comments on another subject, and highlighted a new instruction on power limitations. The team found management communication was very strong and management expectations were effectively communicated to the operations staff.

The team discussed operations training, including simulator usage, with the training staff. One concern, expressed in past inspections, was the large number of simulator change requests (SCRs) remaining open. Since a lot of SCRs were submitted by operations and other users (52 since October 1, 1995), simulator staff had developed a priority system from Priority 1 (discrepancies that greatly hindered or limited the ability to conduct an examination) to Priority 4 (discrepancies found to have little or no adverse effect on conducting a licensing examination). The open SCRs were all Priority 3A, B, or C's dealing with recent plant design changes or minor modifications, unrealistic simulator responses, inoperable equipment (i.e., sticky switches), or scenario problems. The team observed the normal Wednesday quiz for the "A" shift. Following a short practice run on the simulator and a talk by the assistant operations manager, the A crew was given a demonstration examination involving normal operations with some failed equipment followed by major failures leading to entry into the emergency plan. The scenario included crew critical tasks for use by the five examiners evaluating the crews. The next step was independent A-crew and instructor evaluations followed by a joint meeting for final evaluation. The team found the Individual and Crew Simulator Evaluations using NT-5701-5 and -7, respectively, were very self-critical and well done. Although a few minor simulator fidelity problems were noted, no adverse effects on the overall examination process were detected.

During each training phase (one week for each of the six crews), operations/training had a special emphasis. One special emphasis for the week observed by the team was "communications" featuring Operations Good Practice (OGP) 003, Communications During Plant Operations. With OGP-003 as guidance, each shift crew and staff crew (those grouped together for training) made a Crew Expectations listing of how they will communicate. The simulator examiners evaluated how well A crew met their own expectations.

Overall, the team concluded that the quality of operations was very strong as evidenced by strong operations management, effective control room communications, log keeping and shift turnovers, quality uses of the training simulator, and good response to the GSC problem. Based on this inspection, the team recommended that the NRC reduce the inspection effort in this area.

2.4 Programs and Procedures (Operations)

Based on the in-office review of NRC and licensee documents relevant to operations, the team found the licensee's performance was generally good. Strengths were well-controlled operations in the control room, operators' attentiveness to plant status, implementation of the procedure upgrade program, establishment of an alarm free main control board, well maintained emergency operating procedures (EOPs), and good operations control of refueling outage conditions. Weaknesses involved inadequate procedural guidance and other problems with the Main Plant Computer system, complex work control process, continued problems for SRO/RO candidates with instrument and control examination questions, plant specific deviations from the Westinghouse owners group (WOG) emergency response guidelines, very large backlog of operating experience review program (OERP) requests, inconsistency between two operations refueling procedures involving reactor cavity water level transmitters, and inconsistent component labeling between the safety analysis report and procedures for remote safe shutdown system operation.

The team used insights gained during the in-office review to plan the onsite inspection activities. These inspection activities included review of the progress of the procedure upgrade program, the adequacy of new procedures, work control process, computer system control, and OERPs backlog.

During the onsite inspection, the team reviewed the progress being made on the procedure upgrade program (PUP) being guided by procedure NUC DC 2, "Developing and Revising Procedures and Forms." The PUP standardized procedure format, presentation, and content, highlighted cautions and notes, and contained, as hidden text, the design bases for limits. The operations PUP was behind schedule with only about 1 percent of operations procedures completed. To speed up operations PUP, a coordinator, alternate control room or nuclear system operator qualified as licensed RO, was assigned for each shift. These individuals were to coordinate the PUP work of their shift. Two licensed SROs were assigned as procedure upgraders on day shift. However, most of their time was spent just keeping the non-upgraded procedures up-to-date. In addition, a licensed SRO had responsibility for keeping the emergency and abnormal operating procedures current.

The team selected several upgraded procedures for detailed review. The selected procedures appeared much improved and clearer to use. The procedures contain a hidden basis information feature where the basis for a setpoint value is not shown in the procedure text but is to be available to the user from the computer data base when this information is needed, as a subset of the procedure. However, it was noted that OS 1026.04, "Operating DG 1A Starting Air System," specified the air compressor would maintain the starting air receivers pressure between 560 and 600 psi. The basis information for these values mentioned only the vendor manual, not the clear UFSAR requirement

for each starting air system to be capable of starting a diesel generator within 10 seconds at least five times. The vendor's manual stated, "Start the air compressors and charge the tanks to 560-600 psi." The team reviewed the 1986 DG-1A air start system capacity test and the 1994 engineering evaluation of DG starting air system operability requirements. A minimum of 560 psi was required to get the five starts within the 10-second requirement. The team expressed its concern that real licensing bases were not referenced in the PUPs. The licensee processed a procedure change to include the real basis for the pressure limits and provided this change following the onsite inspection.

The team reviewed the work control process identified by the licensee and the NRC as one of the major problems during outages and with the on-line maintenance program. As mentioned in Section 2.1, operations has assigned licensed SROs for work control and planning and scheduling. As addressed in the maintenance section of this report, considerable improvement in these functions occurred because of operations personnel reassignments.

The team requested a printout of the active Master Tagouts (MTOs) for review of some of the files. The computer listing showed 154 MTOs were active but the first six oldest folders were not in the storage cabinet. A further check revealed 56 of the folders were missing. The licensee indicated that some of the newest folders were being planned or scheduled and some were closed. However, a computer programming problem prevented closeouts in the database. The team requested a status of all MTOs listed as active but really closed. When this data was provided, the licensee informed the team that this computer problem had existed for about 1 ½ years, and that they had made plans to upgrade the program. The team considered this long-term computer deficiency a weakness in the licensee's program.

Overall, the operational programs and procedures were generally good and effectively used, and the upgraded procedures were a strength. However, the procedure upgrade program being behind schedule and the tracking of the master tagout status were weaknesses. Based on this inspection, the team recommended that continued normal inspection effort of programs and procedures be maintained.

2.5 Conclusions and Recommendations (Operations)

The team concluded that the licensee demonstrated appropriate safety focus regarding equipment problems, normal operations, and had appropriate management involvement in establishing daily priorities and for participating in decision making. The licensee exhibited good problem identification capability through normal evolutions and self-assessments. However, for problem resolution, although the licensee was maintaining the plant in good condition, the large number of open items was considered a vulnerability. The quality of operations was strong as evidenced by strong operations management, very good control room communications, log keeping and shift turnovers, quality use of the training simulator, and thorough response to the Generator Stator Cooling problem. The licensee's programs and procedures were generally good and effectively used. However, the poor tracking of the master tagout status was a weakness.

Overall, the team recommended that NRC inspection of the operations area be reduced except for the areas of problem resolution and programs and procedures.

3.0 ENGINEERING

3.1 Safety Focus

The team conducted in-office review and assessment of both NRC and licensee documents relevant to engineering safety focus. This review indicated that engineering was providing good support to the plant and addressing safety significant issues. A sample of the licensee's quality assurance audits supported the view that engineering's performance was strong since no safety significant issues were identified. The system engineers had provided a high quality safety contribution, but the corresponding level of design engineering safety focus was not clear. In most cases, plant management demonstrated conservative safety perspectives. The licensee's engineering department had undergone changes so the team preliminarily concluded that the engineering safety focus warranted normal inspection effort.

During the onsite visit, the team conducted tours of two of the plant systems to observe equipment condition and determine the level of system knowledge of the system engineer and design engineer. The team sampled sections of the Updated Final Safety Analysis Report (UFSAR) to determine if the licensing basis was properly implemented into plant practices and procedures. The team interviewed system and design engineering personnel to determine the extent of engineering involvement with operations and maintenance and reviewed operability evaluations. In addition, the team reviewed the engineering backlog to determine if it was manageable and if safety significant items were assigned the proper priority and completed in a timely manner.

The team reviewed the UFSAR chapters for the emergency feedwater system and the emergency diesel generator system. The UFSAR for the diesel generator starting air system stated that the design basis was to have enough air in the air receivers to start the diesel five times without running out of air. During initial plant pre-operational testing, the diesels had been tested to demonstrate the ability to meet five starts from an initial air pressure of 560 psig. The team noted that the diesel generator starting air compressors were set to start at 560 psig, which met the intent of the UFSAR. However, the team was concerned that the low pressure alarm setpoint for the receivers was 460 psig, 100 psig below the 560 psig design basis value. The low alarm setpoint is an early warning to the operators that the compressors had failed. The setpoint level provided the possibility of having the diesels in a condition (receiver as low as 461 psig) where the five start requirement could not be met. The team did not have any other concerns with the UFSAR in the engineering area. The team reviewed the System Engineering Handbook, dated September 19, 1995, which required that the system engineer ensure that the Technical Specification and Updated Final Safety Analysis Report requirements were met for the assigned systems. However, the team was concerned that the current program at Seabrook did not require the system or design engineers to review these requirements periodically.

The team reviewed the engineering inputs to adverse condition reports (ACRs) and determined that the responses were technically reasonable and the operability determinations conservative. The team reviewed a number of open and closed requests for engineering services (RESs) and found that engineering was completing those that had safety significance in a timely manner and working the lower priority RESs as time permitted. In general, engineering related work products were found to be of high quality and supportive of plant operations.

The team determined that the positive safety focus, knowledge, stability and experience level of both design and system engineering and their involvement with the plant was a notable strength. The team determined that the engineering staff was active in nuclear industry committees and users groups, which provided the site with engineering input from industry. Design engineering had demonstrated involvement in site activities. The modification process required the design engineer, the responsible system engineer and operations to walk down the systems to be modified. This encourages agreement of the affected departments.

During the walkdowns of the emergency feedwater system and the diesel generator system, the team found that the equipment was well maintained and the system engineers and design engineers were very knowledgeable of the systems. The team did not find significant discrepant conditions or an excessive amount of discrepancy tags hung on the plant systems.

Overall, engineering demonstrated a strong safety perspective. Based on this inspection the team recommended that normal NRC inspection effort in this area be continued.

3.2 Problem Identification and Problem Resolution (Engineering)

3.2.1 Problem Identification

The team conducted in-office review and assessment of both NRC and licensee documents relevant to engineering problem identification. This review found that engineering had been effective in identifying problems. An example of this was system engineering recommending the need to upgrade the inspection activity of the underground service water pipe. The system engineers were knowledgeable of system design and operation, past problems, status of corrective actions, and improvement plans. This was reflected in the system engineering Annual System Performance Reviews. The team preliminarily recommended that the NRC maintain a normal inspection effort in the problem identification area.

During the onsite visit, the team reviewed engineering effectiveness in identifying, resolving, and preventing problems by reviewing corrective actions, root cause analyses, and resolutions of technical issues. The processes to identify problems and provide for their resolution, including the applicable procedures and resulting documentation, were examined. Examples of problem identification and resolution were discussed with the engineering staff.

The team reviewed the 1994 system annual performance reports for the emergency diesel generators and the emergency feedwater systems. The team found that the system engineers were extensively trending component parameters such as temperatures and pressures. The system engineers used these trends to determine if there were early signs of component degradation.

During a walkdown of the emergency feedwater system, the team found two spring can supports with their springs solid compressed. The spring cans were located on the non-safety related portion of the emergency feedwater condensate removal lines to the steam driven Terry turbine. The failure of the system engineer or operations personnel to identify the solid compressed spring cans was considered a weakness. The team reviewed the System Engineering Handbook and found that the system engineers were expected to perform walkdowns of their systems regularly using the guidelines of the handbook to ensure system availability. Evaluation of the scope of engineering walkdowns found that design and system engineers were fully involved in those portions of systems with identified problems. However, a periodic walkdown of areas in systems not associated with known problems was not being performed. For example, system engineers responsible for certain radwaste systems had no visits to portions/rooms of the system in up to four years. This was considered as a weakness.

The requests for engineering services and the adverse condition reports were found to be significant inputs to the problem identification process. Engineering and other plant departments used these documents to identify areas of concern. In addition, the system engineers trended and tracked a number of parameters of equipment in their applicable system. The generator stator cooling problem was a positive example of problem identification and excellent engineering response. The team considered engineering's identification of the failed card in the electro-hydraulic control (EHC) cabinet, which caused the plant trip in January 1996, to be another positive example of good engineering response and problem identification.

Overall, design and systems engineers were found to be effective in identifying problems. Based on this inspection, the team recommended that normal NRC inspection effort be continued in this area.

3.2.2 Problem Resolution (Engineering)

The team conducted in-office review and assessment of both NRC and licensee documents relevant to engineering problem resolution. This review found that although problems had been identified, their resolution was often significantly delayed or incomplete without root cause analysis or appropriate corrective actions. Examples included the licensee's attempts to correct the main steam isolation valve problems, lack of identification of the significant contributing factor for the containment personnel hatch event, and the root cause for the primary component cooling water heat exchanger tube degradation. In addition, corrective actions for the primary component cooling water surge tank hydrazine depletion appeared ineffective and the root cause for the high vibration of the emergency diesel generators had not been determined. The team found that there had been 52 temporary modifications installed in the plant in late 1994, which appeared to be a large number for a one unit plant.

The team preliminarily recommended the NRC increase inspection effort in this area.

Onsite, the team found that system and design engineering had effectively addressed significant plant problems. Examples included systematic evaluation and resolution of the generator stator cooling problems, the resolution of the EHC card that caused the January 1996 reactor trip, and the early detection and replacement of the reactor coolant system flow transmitter started to drift and was detected early due to the transmitter trending program. The team found that the backlog of engineering work was decreasing and that the licensee had appropriately prioritized the work. The total backlog had declined from 457 items in July 1995 to 347 items in January 1996. The team found that the plant had 42 open temporary modifications and 4 pending SORC approval. A few of the temporary modifications dated back to 1986. The team also considered the age of some of the temporary modifications to be excessive.

Overall, the team considered that the licensee's responsiveness to problems was usually positive. However, engineering resolution of some problems had not been timely or effective. Examples included the long standing problem of emergency diesel generator vibrations, and the continued degradation of the tubes in the primary component cooling water heat exchanger. For less important performance issues and equipment problems, resolution in a timely manner was not the norm.

Based on this inspection, the team recommended increased NRC inspection in this area.

3.3 Quality of Engineering Work (Engineering)

The team conducted in-office review and assessment of both NRC and licensee documents relevant to engineering work quality. This review found the overall quality of engineering work to be generally high, but exceptions were noted. The service water design basis document incorrectly identified that there was no safety function for the service water cooling tower pump discharge vacuum breaker valves. The corrective actions of Licensee Event Report 94-019 appeared to be insufficient since the root cause had identified hardened grease and dirt accumulation as one of the contributors to the failure of the high speed lock out relays without followup to other potentially affected components. The licensee had replaced the relays with another vendor's product without mentioning that the maintenance group should check for grease and dirt accumulation in related areas. The training program for the engineering staff appeared well developed and implemented. The 10 CFR 50.59 safety evaluations were comprehensive. The team preliminarily recommended that the NRC maintain normal inspection effort in this area.

During the site visit, the team assessed the effectiveness of engineering in providing plant support, reviewed modification packages, calculations, requests for engineering services, adverse condition reports and quality assurance audits. The team sampled examples of engineering work and discussed the work with the engineer involved.

The team reviewed a number of closed requests for engineering services, completed adverse condition reports, and modifications and determined that these documents showed strong technical capability and evaluations. The engineering work products were well documented and technically sound. The operability evaluations in the adverse condition reports were conservative. The team reviewed minor and major modifications, which included the emergency diesel generator fuel oil fill and transfer line system pressure increase, the diesel generator turbocharger support bracket replacement bolting and the service water to the diesel generator water jacket heat exchangers piping replacement. The 10 CFR 50.59 safety evaluation for the service water piping replacement was very thorough. The team concluded that the engineering work was generally of high quality.

The team also reviewed engineering calculations and found that the majority of those reviewed were well done. However, for calculation SBC-698 on the thermal power level setpoints for main steam safety valves operability, the team found that some of the assumptions made in the calculation were non-conservative although the final result was not in dispute. The team considered the engineering lack of knowledge of the operation of the safety valves to be a negative observation.

Overall, the quality of engineering work was found to be very good. Based on this inspection, the team recommended that normal inspection effort be continued for this area.

3.4 Programs and Procedures (Engineering)

The team conducted in-office review and assessment of both NRC and licensee documents relevant to engineering programs and procedures. This review indicated that system engineering was very knowledgeable of their systems and that engineering programs and procedures appeared to be well developed. The team preliminarily recommended that the NRC maintain normal inspection effort in this area.

During the onsite inspection, programs and procedures applicable to engineering work were reviewed. The procedures the team reviewed were found to be well developed. The team reviewed the inservice test program by determining if components selected by the team were included in the program. From the sample chosen, the team concluded that the components were in the program and being properly tested.

The team review of system engineering trending indicated it was a strength. However, the team was concerned with the lack of specific requirements for the system engineer to perform walkdowns. This was contrary to the system engineering handbook that stated the system engineer was expected to perform walkdowns in accordance with the handbook guidelines.

The team reviewed the program for the handling of industry information. In 1994 the backlog of industry information was approximately 300 items. These items consisted of NRC correspondence such as Information Notices and vendor bulletins and correspondence. The Nuclear Safety Engineering Group was formed in October 1994 to consolidate the groups reviewing industry information and

to reduce the backlog. In addition to reviewing industry information, the group performed independent assessments. At the time of this inspection, the backlog had been reduced to 86 items. The size of the group was four individuals, each with greater than 10 years experience. The group screened each item as it was received. Follow-up of issues was handled by a group member. Commitment dates were assigned and if these dates were late and not re-negotiated a group member tracked them. The team found that the licensee had very good control over the industry information program.

Overall, the team concluded that the engineering programs and procedures were well developed. Based on this inspection, the team recommended that normal NRC inspection effort be continued in this area.

3.5 Conclusions and Recommendations (Engineering)

The team determined that the positive safety focus, knowledge, stability and experience level of both design and system engineers and their involvement with the plant were notable strengths. The team identified some negative observations for licensee review and corrective action as appropriate. These included: the current program at Seabrook did not require the system or design engineers to review the UFSAR requirements periodically; there was a lack of specific requirements for the system engineer to perform periodic walkdowns; and recurring equipment problems, such as corrosion in the primary component cooling water heat exchanger tubes and the vibration and alignment problems in the diesel generator, that had not been fully resolved. In general, engineering work products were found to be of high quality and supportive of plant operations. An exception to this was noted in the calculation of the thermal power level setpoints with inoperable main steam safety valves. The system engineer trending program was considered a strength. The engineering programs and procedures were well developed.

Overall, the team concluded that the performance of design and system engineering was very good. The team recommended normal inspection effort be continued for the area of engineering and also recommended inspection focus on problem resolution.

4.0 MAINTENANCE

4.1 Safety Focus (Maintenance)

The team conducted an in-office assessment of both NRC and licensee documents relevant to the maintenance area. Based on this review, the team determined that maintenance performance appeared to be a strength due to a lack of maintenance caused problems through most of the period covered by this inspection and the licensee's ability to effectively perform a shortened refueling outage. However, the team was unable to assess the safety focus in overall maintenance planning. The team preliminarily concluded that increased inspection was warranted in this area.

During the onsite inspection period, the team attended maintenance planning and scheduling meetings, planning meetings for implementing the "Maintenance

Rule," and pre-work briefings for specific jobs. The team observed performance of the work control group and maintenance jobs in progress. Probabilistic risk assessment (PRA) and reliability and safety engineers, maintenance planners, maintenance schedulers, controllers of routine task performance (preventive maintenance and surveillance tests), system engineers, maintenance supervisors, maintenance technicians, procedure writers, and engineering and maintenance managers and supervisors were interviewed.

Based on the above interviews and observations, the team found that there was an excellent safety focus in maintenance planning and performance. Maintenance planners issued comprehensive job packages, which included the work request (WR) or repetitive task sheet (RTS), procedures and drawings (if required), material and tagging requests. Licensed Senior Reactor Operators recently had been assigned to the planning group to strengthen inputs to tagouts and to ensure plant operating requirements were not violated. This additional operator review in the up-front planning was a strong additional safety check. In addition, most work packages (except for minor maintenance) were reviewed by a system engineer prior to issuance of the work package. The work control center, located outside the control room and staffed with licensed senior operators, provided a final review of the work and provided direct coordination with the operating crews.

The licensee developed a scheduling plan called "System Week" in which all known and possible work is scheduled for several systems (usually one major system and a couple minor systems) for one week on a rotating basis. Planning for each system week starts six weeks in advance by identifying the outstanding work that could be performed during the system week. System week meetings included inputs from planners, system engineers, licensed operators, reliability and safety engineers, and probabilistic risk assessment (PRA) engineers for the specific systems to be worked. The team noted a new program being developed to ensure more detailed planning as each system week approached. This planning process assured an extensive safety review prior to authorizing work.

PRA engineers had developed a newly issued procedure to more formally define their input to the maintenance process. In addition, equipment in the plant, which had the potential for tripping the plant, was labeled "Trip Critical" to warn maintenance technicians. "Trip Critical" was also stamped on appropriate work packages.

In April 1995, the licensee started an on-line maintenance program (OLM). The intent of this program was to perform maintenance work on reactor components normally performed only during outages. This was to increase reliability of equipment by not having to wait until outages for repair and to reduce total outage time. Since many of these repairs were trip critical they required thorough planning to ensure plant safety by precluding plant transients. The licensee established several program procedures for performing OLM. However, when trying to perform OLM on several different occasions during 1995, it became evident that the on-line maintenance and related issues were not well planned. Operations stopped OLM activity until proper controls could be put in place. An adverse condition report (ACR) was written concerning the OLM problem. This ACR was very critical of the initial OLM process and provided

possible solutions. The ACR investigation was comprehensive and included an extensive root cause analysis. Although the OLM process initially did not succeed, the licensee showed a good safety perspective by stopping the work and would not restart the process until OLM can be performed safely.

The team concluded that the licensee had an excellent safety focus concerning maintenance activities. Based on this, the team recommended reduced inspection effort in this area.

4.2 Problem Identification and Resolution (Maintenance)

The team conducted an in-office review of both NRC and licensee documents that were relevant to the licensee's problem identification and resolution. The team found that the licensee had developed an adverse condition report (ACR) system to provide a mechanism for a perceived problem, identified by any plant worker, to be documented and reviewed. The Maintenance Group Self Assessment Program, as described in MTDI-001, was found to be well developed. However, little evidence was found that the program was being effectively utilized. The team found that the licensee performed extensive trending of performance data; however, the means by which this data was put to use was unclear. Significant NRC findings, which were identified in early 1994 had been resolved by the licensee, which indicated that the licensee had been effective in resolving regulatory concerns. The team preliminarily concluded that problem identification warranted normal inspection effort and was unable to reach a preliminary conclusion concerning inspection needs for problem resolution due to the need to further assess the effectiveness of ACR corrective actions, the threshold for problem identification, root cause analyses, resolution of QA/QC findings, QA's monitoring of maintenance activities, and the overall utilization of the Maintenance Group Self Assessment Program.

4.2.1 Problem Identification (Maintenance)

During the onsite inspection, the team reviewed adverse condition reports, STAR (stop, think, act, review) reports, self-assessments, completed work packages, monthly nuclear performance reports, and system engineer annual performance reports. Also, the team toured the plant to determine if plant problems existed that had not been previously identified by the licensee.

The team observed that the licensee process for documentation of problems using adverse condition reports was very good and was being implemented by plant personnel. In addition, the STAR program was utilized by the Maintenance Department to identify lower level concerns. Deficiency Tags were utilized to document equipment deficiencies throughout the plant. The team observed some administrative problems in the deficiency tag system, which are discussed in this section of the report.

Interviews with maintenance department personnel revealed that the Maintenance Department Self Assessment program was a new program which had been established in late 1995. The team reviewed the self assessment reports for 1995 and found that they were comprehensive and raised significant issues for management attention. For example, the self assessment of outage planning for

ORO-4 was critical of maintenance line organization's vertical communications. The licensee initiated corrective actions to improve maintenance communications. The team observed that the maintenance department had established an aggressive schedule for self assessment in 1996.

The use of root cause analysis was reviewed through personnel interviews and document review. The team observed that root cause analysis was performed at different levels (from formal root cause analysis to minimum evaluations and cause/failure analysis). The level of analysis performed was based on the significance of the issue and assigned by management review committees. The team reviewed examples of all three analysis formats and found them to be thorough with appropriate corrective action recommendations.

The team concluded that the problem identification process was very good and that maintenance personnel were using the adverse condition reporting process. External assessments and the Corrective Action Process were being effectively utilized to identify problems in the maintenance department. The team recommended reduced inspection effort in this area.

4.2.2 Problem Resolution (Maintenance)

During the onsite period, the team reviewed outstanding ACRs and work requests, trend reports, and nuclear performance reports.

The team found that the open corrective maintenance backlog was steady at approximately 820 work requests. Interviews with maintenance department managers and review of trend reports revealed that the backlog had been reduced from a high of 1912 in May 1994 to a low of 713 in August 1995. The team observed that having met its previous goal of 850, the licensee had established a new goal of 650. The backlog was addressed on a routine basis as part of the system week planning process to identify work for upcoming system maintenance weeks.

The team noted examples of programmatic problems that had been addressed through the ACR system. The evaluation of problems experienced with the initiation of an on-line maintenance program was thorough and the corrective action plan established was well developed. QA/QC findings were often addressed through the ACR process. Quality Assurance Inspection Report (QAIR) findings were cleared based upon the issuance of an ACR, and then followup inspection was conducted to confirm the adequacy of ACR corrective actions. One area of concern, which was addressed in numerous ACRs in 1995, was the area of Foreign Material Exclusion (FME). This problem was not resolved and had been scheduled for additional attention as a maintenance department project in 1996. Foreign Material Exclusion is further discussed in Section 4.4 of this report.

Interviews with maintenance department personnel revealed that the Maintenance Department relied on a combination of automated and manual tracking mechanisms for corrective actions. The department utilized the site-wide "Action Information Tracking and Trending System" (AITTS) for tracking ACR related corrective actions. Personnel interviewed considered the AITTS to be cumbersome and not user friendly. Maintenance Department Self Assessment

corrective actions were tracked manually and the licensee was evaluating alternatives.

The team conducted an audit of the deficiency tagging system. Of 29 randomly selected deficiency tags hanging in the plant, 15 (52% of the sample) were not listed in a printout of active deficiency tags which was provided to the team. The team researched these 15 deficiency tags at the Work Control Center computer and found that 9 tags should have been cleared (corrective maintenance completed), 2 were in minor maintenance logs, and 4 (14% of the sample) were not tracked in any system and therefore had no work requests generated to initiate repairs. Based on these findings, the licensee conducted a quality control audit of deficiency tags and found that of 363 deficiency tags found in the plant, 22 (6.1%) were tags that were left hanging following corrective maintenance, 45 (12.4%) had no work request initiated, and 20 (5.5%) were tags for which the work request had been voided after evaluation. None of the deficiencies identified by the team or the licensee as having no work request generated posed safety or operability issues for safety related equipment. The licensee documented this problem in ACR 96-81 to ensure formal resolution of this issue under the corrective action process.

Based on this inspection, the team recommended that normal NRC inspection effort be continued in this area.

4.3 Equipment Performance/Material Condition (Maintenance)

The team conducted an in-office review of NRC documents relevant to the material condition of the plant. In addition, the team reviewed licensee documents such as system annual performance reports, to determine equipment performance history. Based on this review, the team concluded that the overall plant material condition was very good. The team noted that problem areas with main steam isolation valves (MSIVs) and the containment hatch event, which had arisen in early 1994, had been corrected. The team preliminarily concluded that equipment performance/material condition warranted normal inspection effort.

During the onsite inspection, the team made numerous tours of the plant. These tours encompassed the control room, the turbine building, the diesel generator rooms, the radiologically controlled area, the switchgear rooms, and other areas of the plant containing major equipment.

The team found that plant material condition was very good. The team noted the absence of system leaks, minimal evidence of equipment corrosion, and effective housekeeping. In most cases, deficient conditions had been identified, tagged, and entered into the maintenance work request system for resolution. The team identified three minor equipment deficiencies that had not been previously identified by the licensee. One problem area noted was that pipe caps, which were called for in the piping and instrumentation drawings (P&Ids), were missing from vent connections on the "A" RHR and CBS heat exchangers, and from a feedwater system drain valve 1-FW-V-0225. The threads on two of these connections were corroded.

During the in-office review, limited documentation for the preventive maintenance (PM) program was available. However, the onsite review observed that the PM program was extensive, well managed, and well documented. All PM tasks including technical specification (TS) surveillance tests, safety related equipment Pms, and balance of plant (BOP) equipment Pms were controlled by the use of repetitive task sheets (RTSs). RTSs were entered in the computer and were issued on the schedule established for each piece of equipment. Depending on the complexity of the task or other legal requirements, the RTS may be self contained (i.e., the RTS is the procedure) or the RTS referenced a specific existing procedure. When issuing the work package, the planners attached the appropriate procedure and other required documents.

The inspector reviewed a listing of all RTSs and noted that there were almost 10,000 Pms and other surveillance tests. The program covers major pieces of equipment in the plant. For the maintenance department, engineering analysts were assigned to maintain and update the RTS data base for plant equipment. The planning department was notified of any changes in RTS frequency for specific pieces of equipment. Other personnel in the Planning Department tracked changes to Technical Specification surveillance tests. Completed RTSs had various levels of review including the maintenan supervisor, operations, the system engineer and the performance eng . Overall, the program was exceptionally thorough.

The licensee also had an extensive predictive maintenance program. The program included 33 oil analyses, 87 pump vibration tests and 34 thermographic analyses. Pump vibration tests were recorded and placed directly into a computer for immediate analysis. All test results were reviewed by system engineers. In addition to predictive tests, thermographic analysis was used frequently for trouble shooting by being able to detect flow disparities in piping by measuring temperature differences. The current program was effective in allowing system engineers to have an additional data point for measuring equipment trends. All current predictive maintenance activities were being performed onsite at Seabrook Station. However, Northeast Utilities was planning a reorganization to place all predictive maintenance under a single organization for all five NU units. When this takes place some aspects of predictive maintenance evaluations would take place external to the plant and additional predictive maintenance processes would be added.

Based on this inspection, the team recommended normal inspection effort be continued in this area.

4.4 Quality of Maintenance Work (Maintenance)

The team conducted an in-office review of NRC documents relevant to the quality of maintenance work. Also, numerous corrective maintenance activities were reviewed. Based on this review, the team concluded that the quality of maintenance work was good and the work force was highly skilled with a good training and qualification program in place. First time repairs were effective and there was little rework. Problems identified in 1994 such as the faulty repair of MSIVs and the blowout of an equipment hatch appear to have been corrected. There were few workarounds. Review of licensee Quality

Assurance Inspection Reports indicated that there may be a weakness in maintenance personnel implementation of foreign material exclusion (FME) requirements. The team preliminarily concluded that the quality of maintenance work warranted reduced inspection effort.

While onsite, the team observed maintenance activities; reviewed program and maintenance procedures; and interviewed maintenance workers, first line supervisors, planning personnel and supervisors, and maintenance department supervisors. The maintenance observations included: a component cooling pump motor breaker exchange, a containment spray pump motor type IAC relay and ground relay inspection, a containment spray pump motor trip check, repair of a leaking manway on a moisture separator reheater, the weekly test and inspection of turbine generator batteries, and the weekly inspection and replacement of turbine generator exciter brushes. The procedures, work packages and working documentation to support these activities were also reviewed. The procedure usage and other controls observed were the same for non-safety related equipment as for safety related equipment. Also, the replacement of exciter brushes was a "trip critical" job, which required extra precautions to preclude tripping the plant. The team noted that all jobs observed were well controlled and that the technicians performing the tasks were knowledgeable. Industrial and nuclear safety precautions were observed and procedures were properly used.

The team found that the personnel observed were knowledgeable in their tasks and exhibited good procedural compliance. First line supervisors observed the status of work frequently. Pre-job briefings were thorough and interactions with the operations department were excellent. The use of a Work Control Center minimized distractions to the operating crew. System engineers were noted to have a strong involvement with the work activities. Work control documents including work requests and procedures were found to be of good quality. The team noted that procedures were being improved through a formal Procedure Upgrade Program. Among the improvements noted in upgraded procedures was an incorporation of human factors considerations in the procedure format.

Interviews with maintenance department supervisors disclosed that FME performance within the maintenance department was a continuing concern. The team noted that this performance area had been identified as a repeat problem in the ACR system and was scheduled to be addressed as a maintenance department project in 1996. During observation of work under Work Request 96W000239 on the 'A' moisture separator reheater, the team observed minor FME deficiencies that resulted in the generation of one STAR report and one ACR.

The team observed excellent control of tools and test equipment. Tool and test equipment issue was automated with equipment issue being tied both to a worker's badge number as well as to the work document that the equipment was issued for. Calibrated equipment was stored in a separate room. The team surveyed a sample of approximately 50% of the equipment in the calibrated equipment storage area and found that the equipment was in good repair and was properly calibrated. Equipment that was out of calibration was tagged and stored in a separate area.

Interviews with maintenance department training coordinators demonstrated the maintenance department had taken ownership of their training program. Close coordination with the training department had resulted in a process that was responsive to the training and qualification needs of the department. Qualification records were well maintained and were used extensively by first line supervisors in workload/manpower planning and maintenance execution.

Based on this inspection, the team recommended reduced NRC inspection effort in this area.

4.5 Programs and Procedures (Maintenance)

The team conducted an in-office review of NRC documents relative to the licensee's programs and procedures in the area of maintenance. Based on this review, the team concluded that there was an extensive program governing maintenance activities; the program contained a number of procedures controlling maintenance activities; and the procedures were comprehensive. There were a "Maintenance Manual," a "Maintenance Management Manual," and a "Planning and Scheduling Manual." In addition, there were several hundred corrective maintenance procedures, preventive maintenance procedures, surveillance procedures, and instrument and control calibration procedures; and also several thousand stand alone RTSs. The existing procedures were effective in providing instructions for performing maintenance, testing and calibration activities. The licensee was currently performing a procedure upgrade program. The team preliminarily recommended normal inspection in this area.

The team found procedure usage to be a strength. Instructions were followed whether they were in a formal procedures or work instructions included as part of a WR or an RTS. Procedures were used at the job site. Although a procedure upgrade program was in progress, most procedures appeared to be adequate as written because of the efforts to keep procedures up to date.

The procedure upgrade program as applicable to maintenance procedures was reviewed. The licensee was upgrading procedures for technical content and to be consistent with the format of procedures used by other Northeast Utilities plants. The program started in April 1995 and the projected schedule for all procedures to be upgraded was by the end of 1998. The team watched one PM performed using an upgraded procedure. The procedure was clear and useable.

Based on recent problems noted at other facilities in UFSAR commitments not being met, the team reviewed the inclusion of the UFSAR commitments in procedures when appropriate. The program procedure for procedure upgrade stated that the UFSAR should be considered when upgrading a procedure, but discussions with procedure writers indicated that there was a weakness in that there was a lack of emphasis in this area. In addition, there was a word search program on the computer for the writers to research regulatory, UFSAR, NRC and other commitments that may be applicable to a procedure which was being upgraded. However, a demonstration of the current word search program indicated that it was not user friendly. The licensee had recognized this problem and planned to change to a new and more powerful program that would improve word search capability.

Based on this inspection, the team recommended that normal NRC inspection effort be continued in this area.

4.6 Conclusions and Recommendations (Maintenance)

Overall, the material condition of the plant was found to be very good. Maintenance technicians were well qualified to perform their assigned tasks and specific qualifications were properly maintained and tracked. Planning and scheduling was a strength. Maintenance work packages were found to be comprehensive and useful to the maintenance workers. The "System Week" process provided a useful mechanism to focus attention of plant departments on a system and safely work on deficiencies, system by system, while minimizing the impact on plant operations. There was excellent safety focus on maintenance activities in the planning process. Probabilistic Risk Assessment engineers, safety and reliability engineers and senior reactor operators participated in system week planning. In addition, licensed reactor operators were included in the planning process and system engineers approved work orders and repetitive task sheets except for very minor maintenance. Both the preventive and predictive maintenance programs were strong and effective.

There were some weaknesses identified. Errors were noted in the deficiency tag system. The team observed that sometimes deficiency tags were not removed even after the work was completed. A followup audit by the licensee found additional deficiency tags not cleared and some deficient items in the plant identified by deficiency tags were not placed in the work order system. The procedure upgrade program was behind schedule and the anticipated December 1998 completion date may not be met. Although processes were in place to assure that UFSAR commitments were being met, there was a lack of emphasis on using these processes. The on-line maintenance process was unworkable and was stopped by the licensee. It needs to be improved before it is tried again. A repetitive problem with the foreign material exclusion procedures was experienced.

In summary, the team recommended that NRC inspection of the maintenance area be reduced except for the areas identified above.

5.0 PLANT SUPPORT

5.1 Radiological Controls

5.1.1 Safety Focus

The team's in-office review of safety focus and management involvement in the area of radiological controls (radiation protection and radwaste management, storage and transportation) found that generally very good safety focus was exhibited by the radiation protection group. Strengths included inter- and intra-departmental communications, external and internal exposure controls, and establishment and implementation of a self-assessment program and a corrective action effectiveness review process. Pre-job briefings were considered a strength. The team noted isolated exceptions in this level of performance in the areas of High Radiation Area access control and personnel exposure reduction (e.g., worker entry into an area posted as a High Radiation

Area without an alarming dosimeter during the fourth operations refueling outage (ORO-4), unnecessary personnel radiation exposure attributable to a missed inspection of control rod clusters during ORO-3, and cancellation of under reactor head inspections due to weaknesses in work planning during ORO-4. The licensee recently initiated shipment of low-level radioactive waste for disposal. Consequently no significant NRC data was available for review for this activity.

During the onsite safety focus portion of the inspection, the team evaluated overall licensee performance during the past two years, which encompassed two operations refueling outages (ORO-3 and -4), and emergent work associated with repair of a leaking manway on the "D" steam generator while the reactor was at power. The team reviewed the coordination and control of daily work activities, pre-planning of work, the effectiveness of communication of management expectations, oversight of work activities, staffing stability, communications, and technical and safety review programs. The team also reviewed licensee radioactive waste management, storage, and transportation practices.

The team concluded that overall, the licensee provided effective coordination and control of work activities from a radiation protection perspective. Of particular note, was the establishment of "Window teams" for ORO-4. The Window teams were comprised of various stakeholders (e.g., operations, radiation protection, maintenance) in the conduct of outage work. The Windows teams were chartered to improve outage planning and reduce the outage duration. Although the implementation of the new Window team concept resulted, in part, in the missing of some early outage planning milestones, the licensee effectively recovered from the missed milestones and provided overall effective planning for ORO-4. The planning included effective communication of management expectations regarding worker performance to address problems encountered during the ORO-3. Radiological goals were also approved and effectively communicated and monitored as were the enhancements made to ensure completion of the control rod cluster inspections prior to placement of the head on the reactor vessel.

The team reviewed the programs for licensee observation and oversight of work activities. These included the audit program, the surveillance program, and the self-assessment and walkdown programs. The team reviewed radiation work permit (RWP) log entries into the radiological controlled area (RCA) by the station, radiological controls, and radiation protection manager and several radiation protection supervisors. There were a good number of entries made by these individuals with the frequency of visits decreasing with increasing management responsibility. The frequency of tours was in accordance with the North Atlantic Management Manual. A radiation protection tour program was also implemented for periodic observation of work activities. The radiation protection manager and supervisors maintained a good understanding of plant conditions and a good level of visibility.

The radiation protection organization remained relatively stable. Although seven positions were recently lost due to reduction in work load (e.g., outsourcing of dosimetry services), use of electronic dosimetry, and re-alignment of responsibilities, no immediate organizational concerns were

noted. The staff was considered to be technically knowledgeable as evidenced, in part, by the certification of five staff members, by the American Board of Health Physics, as certified Health Physicists.

The team noted, that as part of the recent Northeast Utility re-engineering effort, the onsite radiation protection and radioactive waste groups would be reporting to an off-site manager instead of through the Chemistry and Health Physics Manager to the Station Manager. The change in reporting was to have occurred on February 5, 1996. However, because of the need to better define reporting chains and responsibilities, the onsite organization was noted to be developing an organizational transition plan for this change. The plan would evaluate the need to update the Updated Final Safety Analysis Report (UFSAR) to reflect applicable changes. The licensee expected to complete the plan in about 30 days with implementation occurring over the next 90 days. The development of the transition plan was considered an excellent initiative.

The team noted that dependence on contractors during non-outage times was low. Also, selective examination of the training provided personnel indicated generally good initial and continuing training was provided. Of particular note was the recent training provided in support of Department of Transportation rule changes regarding hazardous material training. Examination of radiation protection procedures indicated very good technical bases for the procedures.

Regarding radioactive waste management, storage, and transportation, the team noted that since initial commercial operation of the station in approximately March of 1990, the licensee was barred from shipping radioactive waste off-site for disposal due to provisions of the Low Level Waste Policy Act. Consequently, prior to the first shipments of radioactive waste off-site for disposal in December 1995, the licensee's major radioactive waste management efforts were directed toward waste minimization and storage. The team noted that the licensee purposely elected to not transport waste for additional volume reduction (e.g., use of incineration and or super-compaction) in order to avail itself of potential improved technologies when it finally was permitted to ship radioactive material off-site for disposal.
The team noted that the licensee received high accolades from an industry assessment in May 1995 regarding the station's waste minimization efforts. The efforts included personnel training, leak reduction efforts, establishment of a "green is clean" program, minimization of contaminated areas, and use of add-on demineralizers to minimize waste production. The licensee also recently (approximately late 1995) changed to an improved demineralizer system to further improve liquid clean-up and reduce waste production.

The team found that comprehensive self-assessments were performed by the radiation protection and radioactive waste organizations. The assessments were of overall good quality. Corrective actions were established, as appropriate, and implemented in a timely fashion.

Based on this inspection, the team recommended reduced NRC inspection effort in the area of radiological controls.

5.1.2 Problem Identification and Resolution (Radiological Controls)

The team's in-office review of problem identification and resolution in the area of radiation protection and radioactive waste indicated that generally very good and improving problem identification and resolution programs existed. However, corrective actions for previously identified concerns (i.e., worker adherence to high radiation area access controls) did not appear to be effective. Also, it was not apparent that all appropriate radiation protection and radioactive waste management, storage, or transportation programmatic findings were consolidated, trended, and evaluated in a comprehensive fashion. Lastly, it was not apparent, in some instances (i.e., audits of radioactive waste management) that individuals with appropriate levels of knowledge audited program areas.

During the onsite portion of the inspection, the team reviewed the various programs used by the licensee to identify and document radiation protection, radioactive waste management, storage, and transportation problems. The programs reviewed by the team included the adverse condition report program, the radiological occurrence report program, the audit and surveillance program, the self-assessment program, and the walkdown program. The team noted that the self-assessment program was a relatively new program (draft program implemented in 1993) that was followed by subsequent development (late 1994) of a self-assessment guideline by North Atlantic Energy Services Company. The team noted that the onsite radiation protection and radwaste groups subsequently developed a procedurally described self-assessment program with schedules.

Based on review of documents and discussions with cognizant licensee personnel, the team concluded that the licensee possessed a variety of generally effective programs to identify and document problems. The programs provided for escalation of problems to higher levels of management based on their significance. The licensee used state-of-the art investigation techniques (e.g., human performance evaluation, barrier analysis) to review events.

The onsite inspection also found that the radiation protection and radwaste organization had performed a comprehensive review of all radiation protection and radioactive waste management findings identified over the past two years. The findings were categorized and the licensee developed an action plan (with assigned individuals and due dates) for each finding. The licensee also used external audit/assessment groups to evaluate program areas (e.g., radioactive waste minimization). The team concluded that radiation control problems were effectively documented, trended, tracked, brought to station management's attention, and resolved. The team further concluded that overall, corrective actions were effective.

Although overall licensee oversight of plant conditions was good and station material conditions appeared very good with few system leaks noted, the team did note several observations during station tours that indicated an apparent need for improved sensitivity to conditions, such as ground water intrusion. For example, the team noted that some rooms in the radioactive waste building had not been entered by cognizant system engineers for at least four years (e.g., resin sluice tank room and floor drain collector tank room). The resin sluice tank room had a small quantity of resin on the floor while the floor

drain tank room showed some apparent long term ground water in-leakage. Also, radioactive waste drums were found in standing water in the hallway on the minus (-) 26 foot elevation of the radioactive waste building. Ground water appeared to be corroding electrical conduits and pipe supports on this elevation and had deposited a white residue on the metal. The team further noted that a fire permit for an oil waste storage location (Asphalt Storage Building) did not present the maximum allowable fire loading.

The licensee informed the team that previous studies of the water found it to be non-corrosive and indicated the observations did not present any immediate safety concerns. The licensee moved the barrels out of the standing water and initiated action to clean and paint affected metals. The fire permit was updated with applicable fire loading information. These observations indicated an apparent need for improved attention to detail when touring the station.

During the onsite inspection effort, the team identified several weaknesses in the area of radioactive waste storage. The team reviewed the applicable portions of the UFSAR that related to the areas inspected and the following inconsistencies were noted between the wording of the UFSAR and the plant practices, procedures and/or parameters observed by the team. Section 11.4.2.6 of the UFSAR indicates that radioactive waste or materials will be stored in the shielded storage room in the ground floor storage area at elevation 25' of the Waste Processing Building (WPB) next to the loading dock, the Unit 2 Cooling Tower, or the Asphalt Storage Building. The team noted that secondary radioactive waste storage locations were established within the radioactive waste building that were not identified in the Updated Final Safety Analysis Report (UFSAR) or as the subject of a 10 CFR 50.59 evaluation. The team noted storage of spent filters in high integrity containers on scaffolding above the blowdown recovery system demineralizers below floor plugs on the 25' elevation of the WPB, storage of drummed material (reading up to 800 Mr/hr on contact) in the entrance passage of the Spent Resin Sluice Tank Annulus Room (-31' WPB), storage of pre-sorted trash in the Waste Concentrator Rooms(-31'WPB) room, and storage of sources in the centrifuge cubicle (WPB). The licensee immediately completed safety evaluations for these storage locations and initiated actions to review and update the UFSAR as appropriate. No safety concerns were noted during completion of the safety evaluations.

The team noted that overall, audits of the radiological controls program were of good quality, however, the above observations, relative to radioactive waste and material storage and the team's observation that audit personnel assigned to review radioactive waste management activities (e.g., initial shipments of radioactive waste from the station in December 1995) had not received any recent training in radioactive waste transportation activities, indicated an apparent need for improvement in problem identification in the area of radioactive waste management, storage, and transportation.

Based on this inspection, the team recommended normal inspection effort in the area of radiological controls with emphasis in the area of radioactive waste management, storage, and transportation.

5.1.3 <u>Quality of Plant Support (Radiological Controls)</u>

Based on in-office review and assessment of NRC and licensee documents, the team preliminarily concluded that the licensee's overall performance in the area of radiological controls was good and improving through licensee initiatives (e.g., enhanced access controls, radioactive waste minimization, worker briefings, and pre-job planning) and increased attention to detail. Further, overall radiation protection performance for the most recent outage (November-December 1995 was very good with most outage occupational exposure goals met. Although no apparent programmatic concerns were noted with High Radiation Area access controls, one worker was noted by the team to have entered (December 8, 1995) an area (containment) posted as a High Radiation area without all required dosimetry (i.e., electronic dosimeter), a previous concern. Concerns were also identified relative to ALARA planning of work.

Onsite, the team reviewed radiation protection performance for the past two refueling outages (ORO-3 and -4) as well as the radiological controls provided for work performed in the containment with the reactor at power. The team also observed the briefing of workers entering the containment to locate leaks. The team selectively reviewed access controls; radiation work permits; radiation, contamination, and airborne radioactivity surveys; personnel exposure results; and instrument calibrations. The team also selectively reviewed the licensee's onsite radioactive waste management, storage and transportation programs. The team selectively reviewed the initial dry-active radioactive waste shipments made by the licensee in December 1995. Lastly, the team reviewed the in-place program and station facilities relative to commitments outlined in the Updated Final Safety Analysis Report (UFSAR).

The team concluded through onsite performance based inspection efforts that the licensee provided overall effective planning, control and oversight of station work activities. Radiological surveys made to support work were effective. The content of pre-job briefings and job coverage by radiation protection personnel were appropriate. In addition, good performance was achieved in the control of radioactive materials and contamination. Of particular note was the licensee's program to monitor "green is clean trash" for disposal. There were no unplanned personnel exposures (external or internal) over the past two years. No significant skin contamination or exposure occurred. The frequency of anomalous dosimetry results was low and anomalous results were properly reviewed. The team noted that the radiation protection program organization maintained the radiation monitoring instrumentation outlined in the UFSAR with one exception. The licensee did not possess the 0-10R dosimeters indicated in Table 12.5-2 of the UFSAR. The licensee did however have at least 4 times the numbers of 0-200R dosimeters indicated in the same table. This supply was considered more than adequate to meet the commitments.

The team reviewed the exposure results and radiological controls for the higher aggregate personnel exposure repetitive and non-repetitive tasks performed by the licensee during ORO-4 (e.g., cavity seal replacement, let-down heat exchanger gasket replacement, and reactor vessel guide funnel inspection) and concluded that the licensee's overall performance was very good on these tasks. Mock-up training was used where appropriate (e.g., steam

generator nozzle dam work). The licensee meet overall ORO-4 and 1995 year-end exposure goals. The licensee effectively planned work and very good inter and intra departmental communications were evident. Also, numerous initiatives were implemented to reduce radiation exposure over the life of the station (e.g., permanent cavity seal, resin sluice piping vibrators, enhanced use of closed circuit television). However, the team noted that although the performance was very good, 46 percent of the ORO-4 outage occupational exposure (43.5 person-rem) was attributed to "non-ALARA jobs." These were work tasks whose individual accumulated exposure estimate did not reach the 1 person-rem criteria for a comprehensive ALARA review. To date, the licensee's aggregate radiation exposure has been low.

The team noted that the licensee does not routinely perform ALARA cost-benefit analyses (for aggregate occupational exposure reduction purposes) for exposure savings that may be realized over the life of the facility (e.g., exposure reduction over 15-19 refueling cycles). This was considered a weakness. However, as discussed above, the licensee had performed a number of initiatives that would reduce exposure over the life of the station.

The team's review of the entry of an individual into an area posted as a High Radiation Area indicated the entry had minor safety significance in that no actual High Radiation Area (i.e., an area whose radiation dose rates were greater than 100 Mr/hr) was entered and that person was accompanied by an individual with alarming dosimetry. The individual left the electronic dosimetry (later found by radiation protection personnel) on a bench while changing into protective clothing. This was considered a personnel error with no programmatic weaknesses noted.

Records indicated that approximately 4.21 percent (5292 square feet) of the radiological controlled area was contaminated. Of this value, only 0.21 percent (362 square feet) was considered eligible for decontamination. The remainder was administratively controlled as contaminated (2.34 percent or 2942 square feet) or considered impractical to decontaminate (1.6 percent or 1988 square feet). The station exhibited very few contaminated areas.

As discussed in Section 5.1.1 of this report, the licensee supported industry evaluation of its radiological controls program areas. The team noted that a May 1995 low level waste characterization study of the Seabrook Station indicated that the licensee had an exceptional radioactive waste minimization program.

The team concluded that the licensee established and implemented generally high quality radiation protection program. Weaknesses associated with radioactive waste management, storage, and transportation are discussed in Sections 5.1.2 and 5.1.4.

Based on this inspection, the team recommended reduced inspection effort for this area.

5.1.4 <u>Programs and Procedures (Radiological Controls)</u>

The team conducted an in-office review of NRC documents relevant to radiological controls (radiation protection and radioactive waste management, storage, and transportation) programs and procedures. Based on this review, the team concluded that, with isolated exceptions, an effective external and internal exposure control program was established and implemented. The isolated exceptions included entry by a worker, without all required dosimetry, into an area posted as a High Radiation Area in December 1995, and apparent inadequate ALARA planning during the third and fourth refueling outages. Lack of sufficient NRC data precluded assessment of the radioactive waste shipping program.

While onsite, the team reviewed implementation of procedures in selected areas including radiation work permit use; dosimetry records; contamination controls; ALARA; training and qualifications; external and internal exposure controls; instrument calibration; whole body counting; access control; and radioactive waste management, storage, and transportation. The team determined, based on tours of the station, that radiological postings were appropriate and high radiation areas were controlled as required. The team did note that the licensee had established an advanced radworker program that allowed radworkers to perform some independent radiation monitoring. However, the program did not provide upper bounds as to allowable maximum radiation, contamination or airborne radioactive material levels, at which personnel were permitted to perform self-monitoring. Overall, the team noted that radiation protection program procedures were effectively implemented and program elements were controlled by well defined procedures.

Regarding radioactive waste management, storage and transportation, and as discussed in Section 5.1.1 of this report, the team noted that several new radioactive waste/material storage areas within the station's RCA were not identified in the UFSAR nor had a 10 CFR 50.59 evaluation been performed. The team noted that procedures for this activity were weak in that the program to identify and review changes to the station relative to UFSAR commitments did not ensure that new radioactive waste/material storage areas had received a 10 CFR 50.59 evaluation. Also, the team's review of the program (process control program (PCP)) to ensure radioactive waste was properly classified and categorized for shipment and disposal, found that the program was not complete. Specifically the PCP for spent resins and filters was not fully defined. The team noted that these radioactive materials had not yet been shipped for disposal and that the licensee was aware of this matter and was finalizing the program in preparation for final classification and categorization of the wastes for shipment.

The team also found that another area where procedures were weak relative to their use, adequacy, or establishment was the classification and curie determination of dry-active radioactive waste shipped for disposal. The team found that, although no classification errors had occurred and the shipments were of low curie content, the licensee had not decay corrected several dry-active waste radioactive material shipments to account for decay of the radioactive material in storage. The licensee's subsequent analysis indicated that, after decay correcting the radionuclide mixture of the shipments and applying the appropriate radionuclide scaling factors, the radionuclide content was close to original estimates even though the material had been in

storage for a number of years. The licensee attempted to understand the reason for this and noted that low-level radiation measurements of the shipments, made to quantify the total curie loading of the shipments, may not have been accurate. The licensee was reviewing this matter at the end of the inspection.

In addition to the above, the team noted that radioactive waste shipping procedures did not ensure conformance with all applicable contamination control limits outlined in Department of Transportation (DOT) regulations (49 CFR 173.443). Also, the team had difficulty determining if applicable sections of the shipping and waste classification procedures were implemented due to confusion regarding the definition of "package" within the procedures. It was not clear in some cases whether the package included the waste or did not include the waste for weight and density calculation purposes.

Based on this inspection, the team recommended that normal NRC inspection effort be continued in the area of radiation protection with emphasis in the area of radioactive waste management, storage and transportation.

5.1.5 Conclusions and Recommendations (Radiological Controls)

In the area of radiation protection, the team concluded that the licensee's radiation protection program was a generally mature program controlled by well defined and implemented procedures. However, the radioactive waste management, storage, and transportation programs, although considered generally good for current conditions, was considered to be a developing program with procedures in need of improved definition and guidance as discussed above.

Based on this inspection, the team recommends normal inspection effort in this area with increased emphasis in the area of radioactive waste management, storage, and transportation.

5.2 Security

5.2.1 Safety Focus

The team conducted an in-office review of NRC documents relevant to safety focus in the area of security. Based on this review, the team concluded that a strength of the security program is strong management support evident by security equipment upgrades. Additionally, station security staff effectively interact with other station departments as evidenced by their participation in the daily plan-of-the-day meeting, the weekly design-control request meeting, the weekly station-managers meeting, the monthly station safety meeting, and the monthly executive-safety meeting. Such interactions are indicative of security's focus on safety issues. The team preliminarily recommended that the NRC maintain a normal inspection effort.

Onsite, the team reviewed the licensee's physical security program. The assessment of the effectiveness of the security program was based on observations of daily security activities performed by the on shift security force members, document reviews, and interviews with contractor and licensee

security personnel. Areas of the security program that were reviewed included training and qualification, emergency power supply, and emergency access provisions.

Management support for security was evident through continual program improvements and enhancements. Since the last NRC security inspection, conducted in April 1995, the licensee has completed the installation of the vehicle barrier system, purchased and installed four new explosive detectors, and purchased and installed a hand geometry biometrics system that has corrected a licensee identified programmatic weakness concerning the control of protected area badges.

Interdepartmental communications between security and other departments is a strength. Information received from security participation in daily, weekly, and monthly onsite interdepartmental meetings enables security to effectively plan and coordinate work activities to support operational needs in an effective and timely manner and permits security to communicate with other departments to support security needs. Information received from these initiatives is effectively disseminated to the security force through daily shift briefings, weekly management meetings between licensee and contractor security management, and weekly interface between licensee management and security force members (SFMs). The team, determined through interviews, that SFMs are knowledgeable of their responsibilities, morale was positive, and communications between the contractor and licensee security organizations was a strength.

The teams review of security procedures applicable to emergency access provisions, verification of the NRC-approved Physical Security Plan (the Plan) commitments concerning emergency power supply, procedural reviews, and discussions with security training staff, revealed that the programs and mechanisms in place that focus on safety were effective.

Based on this inspection, the team recommended reduced inspection effort in this area.

5.2.2 Problem Identification/Resolution (Security)

The team conducted an in-office review of NRC documents relevant to problem identification and resolution in the area of security. Based on this review, the team concluded that security had recently implemented a formalized self assessment program, effective 9/1/95. However, previously, there had been an informal program in place that had effectively enabled security to identify, resolve, and prevent potential programmatic problems. Through the use of required quality assurance audits, in-house surveillance, continual interface with onsite departments by attending meetings on a daily, weekly, and monthly basis, and the effective use of industry data (Trend Reports), the efforts have resulted in minimal security performance errors and is considered a strength. However, areas were noted where trending was not being properly evaluated and corrective actions not taken to resolve apparent potential weaknesses. The team preliminarily recommended that the NRC maintain a normal inspection effort.

Onsite, the team reviewed the licensee's physical security program. The assessment of the effectiveness of the security program was based on observations of daily security activities performed by the on-shift security force members, document reviews, and interviews with contractor and licensee security personnel. Areas of the security program that were reviewed included the formalized self-assessment program, combined security and access authorization audits and audit responses and adverse condition reports (ACRs).

The team reviewed the formalized self-assessment program and determined by reviewing ACRs, initiated when potential programmatic weaknesses are identified, that the program was an organizational strength. It was noted, during the in-office review, that trending was not being properly evaluated and corrective actions not taken to resolve apparent potential weaknesses. The team concluded based on documentation reviews, observations, and discussions with security management, that the trending was effective and implementation of corrective actions timely.

Additionally, the team reviewed the 1995 combined audit of the security, access authorization, and fitness-for-duty programs, No. 95-A03-01, conducted March 20-31, 1995. The audit identified one finding and seven recommendations. The audit was comprehensive in scope and depth, the results were reported to the appropriate levels of management, and the effectiveness was enhanced due to using technical experts as part of the audit team. However, the audit finding, associated with the access authorization program, concerning a weakness in the licensee Continuous Behavior Observation Program relative to infrequent visitor access into the protected area, had not been resolved.

Specifically, the licensee's NRC-approved Physical Security Plan (the Plan), Revision 19, dated April 26, 1995, Section 3.1, states, in part, that all elements of NRC Regulatory Guide 5.66 have been implemented to satisfy the requirements of 10 CFR 73.56.

One of the requirements of 10 CFR 73.56, as stated in Section (b)(2)(iii), is that the unescorted access authorization program must include behavioral observation, conducted by supervisors and management personnel, designed to detect individual behavioral changes, which if left unattended, could lead to acts detrimental to the public health and safety. Additionally, one of the elements of Regulatory Guide 5.66, as noted in Section 3, under the "Clarification to the Guidelines," is that prior to the reinstatement of an employee's access authorization, it is reasonable to expect that the licensee will ascertain that the activities the employee was engaged in during his or her absence would not have the potential to affect the employee's trustworthiness and reliability.

To satisfy the licensee commitments as described in the Plan, the licensee's continual behavioral observation program requires as documented in the Seabrook Station Security Program (SSSP), Revision 16, Section 3.9, titled "Reinstatement of Unescorted Access Authorization," that if more than 30 days have lapsed since an individual was at the Seabrook Station, the licensee conduct an interview with the individual to ascertain that the activities of

the individual during his or her absence would not affect his or her trustworthiness and reliability.

However, as noted in the audit finding, there was no written procedure or program in place addressing contractors with unescorted access into the protected area that were away from Seabrook Station for more than 30 days and had not been under a continual behavioral observation program. The licensee concurred with the audit finding, however as of this inspection, the team determined, based on discussion with security management and access authorization program staff, that the requirements for the reinstatement of unescorted access authorization were not being met. As a result of questions raised during this inspection, the licensee initiated corrective actions including revision to part 3.12 of the Seabrook Security Manual. The presence of conditions providing the possibility of having badged individuals enter the site after being out of the continual observation program for more than 30 days without ascertaining that the activities of the individual during his or her absence would not affect his or her trustworthiness and reliability is a potential violation. This situation will be reviewed, and if the criteria for a Notice of Violation (NOV) are met, a NOV will be disposed under separate correspondence.

Based on this inspection, the team recommended that normal inspection effort be continued in this area.

5.2.3 Quality of Plant Support (Security)

The team conducted an in-office review of NRC documents relevant to quality of plant support in the area of security. Based on this review, the team concluded that strengths in this area include (1) excellent management oversight and support, (2) effective training evident by minimal personnel errors, and (3) an effective self-assessment and audit program. Weaknesses in this area include (1) the positive control of vehicles in the protected area, (2) assessment aid concerns impacted by environmental conditions and (3) effective control of safeguards information. The team preliminarily recommended that the NRC maintain a normal inspection effort.

Onsite, the team reviewed the licensee's physical security program. The assessment of the effectiveness of the security program was based on observations of daily security activities performed by the on shift security force members, document reviews, and interviews with contractor and licensee security personnel. Areas of the security program that were reviewed included assessment aids, access control of vehicles, testing and maintenance of security equipment, and the safeguards information program.

The team determined through observations, interviews and documentation reviews, that the licensee had effective programs in place in the areas inspected. Vehicles were being properly searched prior to granting access into the protected area and vehicles in the protected area were being properly controlled. The team interviewed licensee and contractor staff responsible for the control and storage of safeguards information, and conducted a walkdown of all safeguards storage containers. The team determined that the program was being properly implemented and that personnel were knowledgeable

of their responsibilities. The team reviewed the testing and maintenance records for security-related equipment and confirmed that the records committed to in the Plan were on file and that the licensee was testing and maintaining systems and equipment as committed to in the Plan. A review of these records indicated repairs were being completed in a timely manner indicative of excellent maintenance support to security systems and equipment. Additionally, a program to upgrade assessment aids, as needed, was in place as a result of a previous NRC concern.

The team reviewed the licensee's Physical Security Plan as it relates to the areas of vehicle access, testing and maintenance of security equipment, and CCTV assessment and verified that the Plan was consistent with security program practices and procedures.

Based on this inspection, the team recommended reduced inspection effort in this area.

5.2.4 Programs and Procedures (Security)

The team conducted an in-office review of NRC documents relevant to programs and procedures in the area of security. Based on this review, the team concluded that a strength was the timeliness in which procedures were revised and information disseminated to the security force once a problem was identified and effectively resolved. To enhance the effectiveness of the department, several members of the security department received training in the performance of root cause analysis so that issues could be further evaluated. However, a weakness was the timeliness in which potential weaknesses were identified or were determined to be issues requiring additional review. The team preliminarily recommended that the NRC maintain a normal inspection effort.

Onsite, the team reviewed the licensee's physical security program. The assessment of the effectiveness of the security program was based on observations of daily security activities performed by the on-shift security force members (SFMS), document reviews, and interviews with contractor and licensee security personnel.

The team determined by reviewing potential programmatic weaknesses identified by the licensee's self assessment program and adverse condition reports associated with each finding, that the procedures were being revised in a timely manner. The team observed SFMs performing their assigned duties in accordance with several recently revised procedures and determined that the SFMs were knowledgeable of their duties and responsibilities. Additionally, the team conducted SFM interviews and determined that changes to the procedures were discussed with SFMs during daily shift briefings as needed. Additionally, a review of training lesson plans indicated that the lesson plans were updated in a timely manner to reflect the procedural changes and satisfied the requirements of the NRC-approved plans.

Based on this inspection, the team recommended reduced NRC inspection effort in this area.

5.2.5 Conclusions and Recommendations (Security)

Overall, the team concluded that the security program was strong. Management support was evident through continual program improvements and enhancements. Problem identification and resolution was generally effective. However, a weakness noted in the area of access authorization warrants the implementation of effective corrective actions. Procedures were well written and satisfied the requirements of the NRC-approved Plan and the SFMs were knowledgeable of their duties and responsibilities. The team recommended reduced inspection effort for the security area.

5.3 Emergency Preparedness

5.3.1 Safety Focus

The team conducted an in-office review of NRC and licensee documentation relative to the safety focus of emergency preparedness (EP). Based on this review, the team concluded that the licensee had a good safety focus as evidenced by appropriate management involvement in EP through emergency response organization (ERO) qualification, emergency plan (E-plan) and procedure reviews, and EP program implementation. Management was also involved in the turnover of off-site programs to Massachusetts and New Hampshire, and assisting the states in the relocation of the Wellesley, Massachusetts and Salem, New Hampshire reception centers. The team also concluded that the EP staff was experienced, though it had been reduced from eight to six individuals since the last program inspection. The ERO had at least three qualified responders in all positions.

The team found that the licensee had not had any actual emergency events in the last two years, but had demonstrated good performance in the December, 1994 full-participation exercise.

Onsite, the team reviewed the organization and management controls employed by the licensee to ensure that management expectations were understood by the staff and that EP responsibilities of the six EP staff members were met. The EP/Community Relations (EP/CR) Manager stated that he met one-on-one with each staff person on a weekly basis to identify priorities and determine work progress. He also conducted weekly staff meetings to discuss open items, general interest topics, and to update key performance indicators. The Department Activity Summary appeared to be an effective management tool to track the department workload and keep personnel informed of department issues. Additionally, the EP/CR Manager met weekly with the EP Director to discuss EP issues. As a result of the company reorganization, the EP Director now oversees the EP programs at all five Northeast Utilities reactor sites. This change was implemented in January, 1996, and its effectiveness has not been evaluated. Overall, management control of the EP program was good.

The licensee utilized the Change Review Committee (CRC) process to control changes to the E-plan and implementing procedures. Each change was assigned a sequential number, received an in-depth review to determine such things as the impact on other programs and if E-plan effectiveness was reduced, and was approved by the EP/CR Manager before implementation or submission to SORC, if

necessary. The team reviewed several CRC change documents and concluded that this process was effective in the quality control of E-plan and implementing procedure changes.

The EP technical staff numbered six, with one clerical staff person and the EP/CR Manager, for a total of eight. The staff was stable and experienced, and the team found them very knowledgeable of their areas of responsibility discussed during this inspection.

Based on this inspection, the team recommended that the NRC reduce the inspection effort in this area.

5.3.2 Problem Identification and Resolution (Emergency Preparedness)

The team conducted an in-office review of NRC and licensee documents relative to EP problem identification and resolution. The review showed that the licensee had implemented a formal self-assessment program in June 1995. The first assessment, completed in October, 1995, was of the facility inventory program, which was an issue in the last two quality assurance (QA) audit reports, and the subject of an NRC violation. This self-assessment was appropriately critical, identifying 35 recommendations for improvement that were acted upon.

The team also reviewed the 1994 and 1995 QA audits, which identified other areas of potential weakness, most notably some missed training requirements by several ERO members and the trend of surveillance failures and corrective actions taken for the post accident sampling system (PASS). These audits were conducted by well-qualified inspection teams, composed of people from North Atlantic, as well as Yankee Atomic and Northeast Utilities. However, audit findings were prematurely closed when the EP responses to the findings were accepted, instead of when all corrective actions were completed.

During the onsite phase, the team reviewed the self-assessment program and found that it was well-defined and fully supported by management. The 1996 self-assessment schedule revealed an average of one assessment per month, with none scheduled during the three months prior to the September biennial exercise. The team reviewed three assessments and found them well-documented and widely distributed. Assessment recommendations were documented in the Incomplete Items List (IIL), the department action item tracking system, for later disposition. Since the self-assessment program was relatively new, its effectiveness was undetermined.

The team also reviewed the IIL, which was on an electronic database. Items were entered into the system by all EP staff as they were identified, and personnel responsibility and due dates were assigned later. Priorities were assigned by due date and individual discussion with the EP/CR Manager. The responsible individual closed items when corrective actions were completed. The EP/CR Manager then signed the items off and they were archived. Items requiring resources outside of EP were entered into the AITTS tracking and trending system. The team noted that due to the low threshold for entering items into the IIL, the system could get overloaded with minor items. The licensee stated that priorities were maintained through discussion at periodic

staff meetings. The IIL system appeared effective in tracking EP program deficiencies.

The team noted that QA audits of the EP program were thorough, met regulatory requirements, and were well-documented. The 1995 audit identified six observations (suggestions to be considered for program effectiveness), none of which were safety significant. However, one observation dealt with facility inventory control, an area of ongoing performance problems and the subject of a recent NRC violation. The licensee initiated an Adverse Condition Report to review this issue and ensure appropriate corrective actions were taken.

The team interviewed the lead auditor for the 1995 QA audit. He provided procedure QPAE 3.0, "Conducting Audits," which stated that an audit finding was closed when the auditee response was accepted by the audit team leader. Then a verification of corrective action was completed after notification by the auditee that the required corrective actions had been completed. This resolved the NRC concern that findings were closed before completion of corrective actions. Also, the team reviewed corrective actions for the ERO missed training requirements and the trend of PASS system surveillance failures, which were noted during the in-office review, and found them to be adequate.

The team recommended that the NRC maintain normal inspection effort in this area due to the repeat problem with facility inventory control and the fact that the effectiveness of the new self-assessment program had not been evaluated.

5.3.3 Quality of Plant Support (Emergency Preparedness)

The team conducted an in-office review of NRC and licensee documents relative to the quality of the EP program. The team found that ERO training was effective, as shown by good exercise performance. Additionally, drill and exercise critique items were effectively integrated into requalification training. Management support of the EP program was excellent. Facility inventory control was a recurring weakness, which was addressed through initiatives such as a new facility inventory manual. Overall, the quality of EP was very good.

Onsite, the team toured the Operations Support Center (OSC), Technical Support Center (TSC), and Emergency Operations Facility (EOF) and found each facility to be well-equipped and operationally ready. Facility inventory control was much-improved. The licensee continued to refine its Facility Inventory Manual by issuing three revisions the last two months. The team conducted a random inventory of facility lockers and found those inspected to be neat, orderly, and containing all items on the inventory lists. One radiological survey instrument had a dead battery, which was immediately replaced. The team noted some minor discrepancies on inventory surveillance forms such as 1) on a few occasions, missing items were not noted as being replaced, 2) on two occasions, malfunctioning equipment was not noted as replaced or repaired, and 3) no line for supervisory review. The team discussed these items with the EP/CR Manager who stated that they would be considered for corrective actions.

The team performed Temporary Instruction 2515/131, "Licensee Offsite Communication Capabilities," to gather information on the licensee's capability to communicate with state and local government authorities during and after a severe natural event.

The team found that the primary means of offsite communications was the Nuclear Alert System (NAS). This was a dedicated microwave system found in the Control Room, EOF, and the two state emergency operations centers (NH and MA). Backup power was off the vital bus, so the system was not protected in the event of loss of all AC power. The first backup system was the private branch exchange (PBX) telephone system, the site's own telephone system. It had battery and diesel backup. The site also had commercial telephone, fixed and mobile cellular phones, and radio backup.

The team noted a licensee-identified design weakness in the offsite communications capabilities in that all telephone systems, including the NAS dedicated microwave, had cable runs through a common room (Room 101) in the Administration Building, which is inside the protected area. This building was not seismic-qualified and is also susceptible to high winds, fire and flood. The radio systems were independent of Room 101, but since they had no link with offsite authorities, emergency information communicated by radio had to be relayed to those authorities. The licensee stated that this design weakness would be reviewed by management for corrective actions to reduce system vulnerability in the event that Room 101 was lost.

The licensee stated that spare radio antennas were stored onsite but that there was no dedicated procedure for restoring offsite communications should they be lost during a severe natural event. The available procedure, "Hazardous Condition Response Plan," was very general and did not specifically address restoring offsite communications.

The team reviewed the licensee's E-plan, which was contained in the Updated Final Safety Analysis Report (UFSAR), related to the areas of emergency facilities, communications, and the emergency response organization, and verified that the plan was consistent with EP program practices and procedures in those areas.

The team recommended that the NRC reduce inspection effort in this area. However, the issue of offsite communication system vulnerability was a concern meriting licensee and NRC attention.

5.3.4 Programs and Procedures (Emergency Preparedness)

The team conducted an in-office review of NRC and licensee documents concerning EP programs and procedures. The team determined that E-plan and procedure changes were thorough and well-documented. The licensee had initiated a re-engineering of the emergency facility maintenance program and created the EP Facility Inventory Manual in response to a recurring weakness in facility inventory control. The team found that the licensee had an effective mechanism to incorporate drill and exercise critique items into the training program. The EP audit program was effective, with audits conducted by strong, independent teams, which met regulatory requirements. A formal

self-assessment program was initiated in June 1995, under which one assessment had been completed.

During the onsite review, the team found that EP training was generally well-defined and effective. There was no ERO qualification requirement for drill participation, but responders were given a facility walk-through and hands-on training for initial qualification. The licensee also conducted continuing training in the facilities, which included table-top exercises. An NRC team member attended two EP training sessions, which had well-defined objectives, good content, and were professionally conducted. Group discussions and videos were used to accent key points.

One self-identified issue was the failure of some ERO members to attend their scheduled training sessions. Each department had a training liaison, who was responsible for ensuring that all responders received their continuing training. When people missed the training, a memo was sent to the person and the liaison to inform them of the make-up date. When personnel missed the make-up, they were given one-on-one training to prevent disqualification. This presented a hardship to the training department since there was only one EP trainer. The licensee stated that the training department was coping with this situation and that some sort of disciplinary action was being considered for personnel who failed to maintain their ERO qualifications current. The team did not note any training deficiencies resulting from this issue.

The team recommended that the NRC reduce inspection effort in this area.

5.3.5 Conclusions and Recommendations (Emergency Preparedness)

Overall, the team concluded that the emergency preparedness program was strong. There was a stable, experienced staff and excellent management involvement. Problem identification and resolution was effective. Facility inventory control, which had been a recurring weakness, was much improved. One area that merited further licensee attention was the offsite communication system vulnerability to a severe natural event. The team recommended reduced inspection effort for the emergency preparedness area.

5.4 Plant Support Overall Conclusion

Based on this inspection, the team recommended reduced NRC inspection for the plant support area.

CONFORMANCE OF THE PLANT AND PRACTICES TO THE UFSAR

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for additional verification that licensees were complying with UFSAR commitments. During an approximate two month time period all reactor inspections will provide additional attention to UFSAR commitments and their incorporation into plant practices, procedures and procedures.

While performing the inspections that are discussed in this report the inspectors reviewed the applicable portions of the Updated Final Safety Analysis Report (UFSAR) that related to the areas inspected. For most situations, the inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures and/or parameters.

The following inconsistencies were noted between the wording of the UFSAR and the plant practices, procedures and/or parameters observed by the inspectors.

In the engineering area, one inconsistency was noted between the wording of the UFSAR and a parameter observed by the team. Paragraph 3.1 of this report described Paragraph 9.5.6.1.c of the UFSAR, which stated that each starting air system was capable of starting a diesel generator within 10 seconds at least five times without recharging the air receiver. During plant startup, the diesels had been demonstrated to meet five starts from an initial air pressure of 560 psig. The starting air compressors were set to start at 560 psig, which met the intent of the UFSAR. However, the low pressure alarm setpoint for the receivers was 460 psig, 100 psig below the design basis value. The low alarm setpoint is an early warning to the operators that the compressors had failed. This provided the possibility of having the diesels in a condition where the five start basis could not be met.

In response to the team findings relating to deficiency tags (see discussion in Section 4), the licensee performed a comprehensive walkdown of the plant to (1) visually locate deficiency tags, (2) to assess the physical deficiency associated with each tag, and (3) to identify any new deficiencies existing in the plant. While performing this walkdown, the licensee identified three instances where procedures do not conform with UFSAR requirements. The inconsistencies relate to the NUREG-0737, Item III.D.1.1 requirement for a program to reduce leakage to as low as practical from systems outside the containment that could contain highly radioactive fluid following an event. Specifically, UFSAR (Section 1.9) requires:

- a hand-over-hand type visual walkdown while the subject system is in operation (usually during a pump test),
- work request numbers initiated when leakage is found to be recorded on the data sheets, and
- the Hydrogen Detection subsystem of the Combustible Gas Control System, including sample lines for post-accident gas samples, to be included in the scope of the leakage reduction program and to be tested using helium detection techniques.

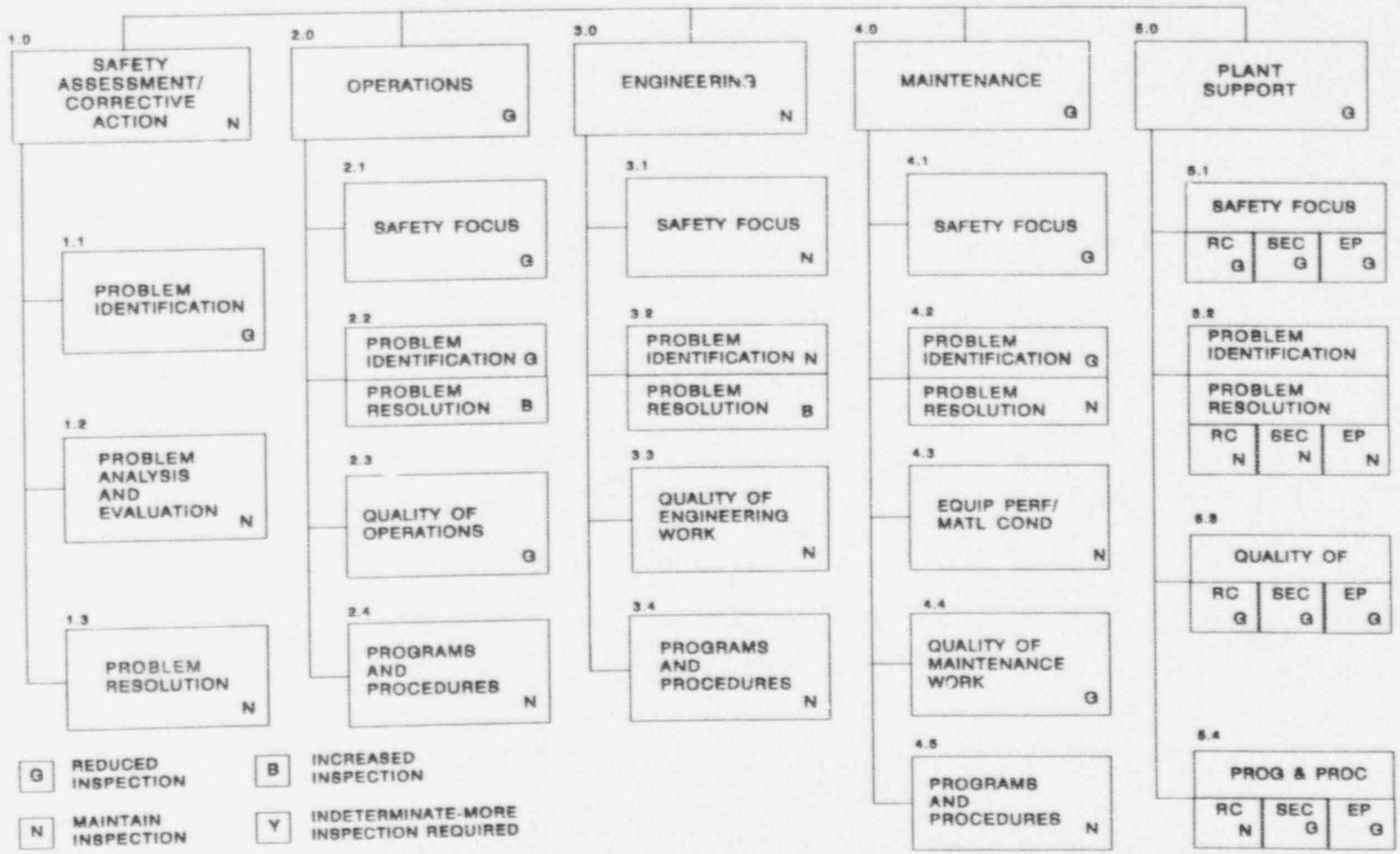
Contrary to these requirements, the Leakage Reduction Program Procedure (EX1801.002):

- provides the option to perform the inspection after the system has been in operation,
- does not require recording work request numbers on the data sheets, and
- states the Combustible Gas Control System is excluded from the Leakage Reduction Program and is tested by procedure EX1801.003, which tests the system using air vice helium.

The licensee initiated an Adverse Condition Report for followup.

ATTACHMENT 1

PERFORMANCE ASSESSMENT/INSPECTION PLANNING TREE



ATTACHMENT 2

DOCUMENTS AND INFORMATION REVIEWED IN-OFFICE

NRC Information

- NRC inspection reports for the current assessment period
- Licensee event reports for 1994 and 1995
- NRC performance indicators

Requested Information

- Corporate and Site Organization Charts
- Performance Indicator Report for Last Year
- Index of Corporate and Site Procedures
- Conduct of Operations Procedures(3)
- Conduct of Maintenance Procedures(3)
- Conduct of Engineering Proceuures(3)
- Conduct of Radiation Protection Procedures(3)
- Operability Determination Procedures(3)
- Maintenance Work Control Procedures(3)
- Reportability Procedures(3)
- Modification Procedures(3)
- List of Special or Standing Orders Issued for Last Two Years
- List of Equipment Performance/Failure Trend Reports for Last Two Years
- Sample(1) of Equipment Performance/Failure Trend Reports
- List of Closed Work Requests, by System, for Last Two Years
- List of Open Work Requests, by System
- List of Completed Requests for Engineering Work for Last Two Years
- List of Open Requests for Engineering Work
- List of Modifications Implemented in the Last Two Years
- List of Modifications Canceled in the Last Two Years
- List of Modifications Approved but Not Implemented (Provide Schedule)
- List of Operability Determinations Performed in the Last Two Years
- Sample(1) of Recent Operability Determinations
- List of Reportability Determinations Performed in the Last Two Years
- Sample(1) of Reportability Determinations for Each Functional Area(2)
- List of Self-Assessments Performed in the Last Two Years
- Sample(1) of Self-Assessment for Each Functional Area(2)
- Copy of the SORC and NSARC Charters
- Sample(1) of Meeting Minutes for the SORC and NSARC for Last Six Months
- Sample(1) of NSARC Periodic Report
- List of Quality Assurance Audits Performed in the Last Two Years
- Sample(1) of Quality Assurance Audits for Each Functional Area(2)
- Root Cause Determination Procedures(3)
- List of Root Cause Determinations Performed in Last Two Years
- Sample(1) of Root Cause Determination
- List of Open and Closed Adverse Condition Reports for Last Two Years
- Sample(1) of Adverse Condition Report for Each Functional Area(2)
- List of Post Trip Review Reports
- Sample(1) of Post Trip Review Reports
- Sample(1) of Performance Reports to Site or Corporate Management
- Documents Describing Station Goals or/and Evaluating Seabrook Performance

DOCUMENTS AND INFORMATION REVIEWED IN-OFFICE (Cont.)

- List of Equipment Tagging Orders for Last Two Years
- Copies of the Five Oldest Equipment Tagging Orders
- List of Operator Work Arounds
- Latest Complete Refueling Outage Critique
- Sample(1) of Corrective Action Request

(1) - Sample size should be determined by data available and document sizes.
(2) - Functional areas of interest are Operations, Maintenance, Engineering, Health Physics, and Security.
(3) - These requested procedures are only a few controlling documents.

ATTACHMENT 3

Personnel Attending Exit Meeting

Licensee:
R. Anderson, Planning, Scheduling & Outage Manager
A. M. Callendrello, Licensing Manager
B. Cash, HP Dept Supervisor
R. Cooney, Asst. Station Director
T. Cooper, Maintenance Support Supervisor
W. Dickson, Engineering Services Supervisor
W. DiProfio, Station Manager
J. Drawbridge, Executive Director-Safety & Oversight
G. Gram, Executive Director Support Services
J. Grillo, Operations Manager
J. Hill, Ops Tech Services
R. Huhah, Training Manager
G. Kline, Technical Support Manager
S. Kukack, Security Supervisor
J. Linville, Chem Dept Supervisor
R. Lizotte, Admin. Services Manager
J. Malone, Nuclear Consultant
G. McDonald, Quality Service Manager
D. Miller Jr, SVP-Safety & Oversight
J. Peterson, Maintenance Manager
B. Roach, MT Dept Supervisor
B. Seymour, Security & Safety Manager
R. Sherwin, Planning, Scheduling & Outage Manager
J. Sobotka, NRC Coordinator
G. St. Pierre, Assist. Operations Manager
P. Stroup, Director-Emergency Planning Manager
D. Tailleart, EP/CR Manager
J. Warnock, NSA Manager
R. White, Mechanical Engineering Manager
D. Young, Senior Emergency Planner

NRC:
N. Blumberg, Inspector, RI
E. Conner, Project Engineer, RI
A. DeAgazio, Project Manager, NRR
P. Goldberg, Reactor Inspector, RIV
H. Gray, Team Leader, RI
J. Jolicoeur, Reactor Safety Engineer
E. King, Physical Security Inspector, RI
F. Laughlin, EP Specialist, RI
R. Nimitz, Sr. Radiation Specialist, RI
J. Rogge, Branch Chief, RI

Enclosure 2

PLANNED NRC INSPECTIONS AT SEABROOK
MARCH 15, 1996 TO MARCH 15, 1997
(Excluding Resident Inspector Reviews)

INSPECTION PROCEDURE NUMBER	TITLE	TYPE	START DATE
	OPERATIONS		
N01	Initial Operator Examination	CO	9/30/96
	MAINTENANCE		
73753	Inservice Inspection	CO	12/4/96
	ENGINEERING		
37550	Engineering (Visit 3)	CO	4/8/96
37550	Engineering (New SALP - Visit 1) - Focus on Problem Identification, Corrective Actions, Work Prioritization, and Repetitive Equipment Problems	CO/ RI	2^{nd} QT FY 97
	PLANT SUPPORT		
82302	Review Exercise Objectives and Scenario	CO	7/22/96
82301	Emergency Preparedness Exercise for PWRs	CO	9/16/96
81700	Physical Security Program (Visit 1)	CO	2/3/97
83750	Occupational Radiation Exposure (Non-Outage)	CO	2/10/97
83750	Occupational Radiation Exposure (Outage)	CO	TBS
84750	Radioactive Waste Treatment and Effluents	CO	1/13/97
84750	Radioactive Waste Treatment and Environmental Monitoring	CO	3/10/97

Abbreviations:
- CO - Core Requirement
- RI - Regional Initiative
- TBS - To Be Scheduled

June 13, 1996

Mr. Ted C. Feigenbaum
Executive Vice President — Nuclear
Northeast Utilities Service Company
c/o Mr. Terry L. Harpster
Post Office Box 128
Waterford, CT 06385

SUBJECT: SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP) REPORT NO. 50-443/96-99

Dear Mr. Feigenbaum:

This letter forwards the Seabrook Nuclear Power Station SALP report for the period January 8, 1995, through May 4, 1996. This SALP was conducted under the revised SALP process implemented by the Nuclear Regulatory Commission (NRC) on July 19, 1993. The SALP process rates licensee performance in four functional areas: plant operations, maintenance, engineering, and plant support. The plant support functional area covers radiological controls, security, emergency preparedness, fire protection, chemistry, and housekeeping.

Overall, NRC observed safe and very effective performance at Seabrook Station during the assessment period, with a good focus on programmatic and performance improvement. Senior station management fostered a strong safety focus with a particular emphasis on problem identification. The corrective action and self-assessment programs continued to develop and mature. The challenging refueling outage was completed safely with excellent shutdown risk management. Online maintenance program development and implementation demonstrated weaknesses, indicating that change management was not effective in this case. Separately, the need for improvements in the process for evaluating events was evident when the staff was faced with resolving several challenging balance-of-plant engineering issues, following the June 18, 1995, manual reactor trip. Onsite and offsite safety review committees provided effective oversight, and together with the Nuclear Quality Programs and the Nuclear Safety Engineering Group provided defense in depth to the overall safe operation of Seabrook Station. NRC has not observed any impact on safe operation from the permanent and temporary resource allocations to other sites within Northeast Utilities. However, we will be closely monitoring your performance.

The plant operations functional area was rated Category 1. Operations management provided very effective oversight with a primary emphasis on safety. Operations personnel maintained a clear, safety-conscious questioning attitude. Control room operations were well controlled with good communications and effective oversight, which resulted in excellent responses to plant transients and to several automatic system isolations. Nevertheless,

Enclosure 3

IE40

there were several minor performance-related examples of operations not being completely effective in meeting programmatic and management expectations.

The maintenance functional area was rated Category 2. The Maintenance Department made significant improvements during the assessment period through enthusiastic support of self-assessment, problem identification, and problem resolution processes. Strong management involvement fostered the performance of maintenance activities in a safe and controlled manner. Safety-related surveillance activities were carefully controlled, coordinated, and implemented. Notwithstanding, several programmatic weaknesses were evident during planning, development, and implementation of online maintenance which resulted in unnecessary challenges to plant operations. In addition, a vulnerability in the work control process resulted in a near-miss draindown of the secondary side of a steam generator.

The engineering functional area was rated Category 1. Overall excellent performance continued in the engineering area. Engineering demonstrated a strong safety perspective as evidenced by thorough safety evaluations. Knowledgeable engineering personnel, who were active in various nuclear industry groups, were implementing well-developed engineering programs and procedures. Plant design modifications were of high quality. Engineering management demonstrated effective control and prioritization of engineering work backlog. The engineering organization performed comprehensive evaluations of emergent operational issues. However, in some instances, engineering resolutions of some longstanding problems were not timely or fully effective.

The plant support functional area was rated Category 1. Performance in the radiation protection area was a licensee strength. Continued effective plant chemistry greatly helped in maintaining a low radiological source term, which contributes substantially to plant maintainability and routine operational activities. Excellent performances in the radiological effluent and environmental monitoring programs were again noted. Performance in the emergency preparedness area continued to be excellent. The security program was effectively carried out. However, NRC found a number of weaknesses in fire protection program implementation, and concluded that fire protection performance, albeit adequate, is not consistent with that of the other plant support functions.

We have scheduled a meeting with your management to discuss our assessments at the Science and Nature Center on June 26, 1996, at 1:00 p.m. The meeting is open to public observation. At the meeting, you and your staff should be prepared to discuss our assessments and any initiatives you plan to take to address the opportunities for improvement noted in our evaluation.

This letter also advises you of our planned inspection effort resulting from the SALP review. The enclosure details our inspection plan for the next year. It is provided to minimize the resource impact on your staff and to allow for scheduling conflicts and personnel availability to be resolved before the inspectors arrive on site. The rationale or basis for each inspection outside the core inspection program is stated so that you are aware of the reason for

emphasis in these program areas. Resident inspections are not listed because of their ongoing nature.

We appreciate your continued cooperation.

Sincerely,

ORIGINAL SIGNED BY:
WILLIAM F KANE FOR:

Thomas T. Martin
Regional Administrator

Docket No. 50-443

Enclosure: Systematic Assessment of Licensee Performance Report No. 50-443/96-99

cc w/encl:
J. Austin Jr., RAC Chairman, FEMA RI, Boston, Mass.
R. Backus, Esquire, Backus, Meyer and Solomon, New Hampshire
S. Choi, Director, Nuclear Safety, Massachusetts Emergency Management Agency, Commonwealth of Massachusetts, SLO Designee
L. M. Cuoco, Senior Nuclear Counsel, Northeast Utilities
F. W. Getman, Jr., Vice President and General Counsel — Great Bay Power Corporation
D. B. Miller Jr., Senior Vice President — Nuclear Safety and Oversight
E. A. DeBarba, Vice President — Nuclear Technical Services
F. C. Rothen, Vice President — Maintenance Services
S. E. Scace, Vice President — Reengineering
W. DiProfio, Nuclear Unit Director — Seabrook Station
A. M. Callendrello, Licensing Manager — Seabrook Station
R. Hallisey, Director, Dept. of Public Health, Commonwealth of Massachusetts
W. Meinert, Nuclear Engineer
Seacoast Anti-Pollution League
State of New Hampshire, SLO
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
S. Comley, Executive Director, We the People of the United States

SALP REPORT - SEABROOK
50-443/96-99

I. BACKGROUND

The SALP Board convened on May 16, 1996, to assess the nuclear safety performance of Seabrook for the period January 8, 1995, through May 4, 1996. The Board was convened pursuant to NRC Management Directive (MD) 8.6 (see NRC Administrative Notice 93-02). Board members were Robert M. Gallo (Board Chairman), Acting Deputy Director, Division of Reactor Projects, NRC Region I (RI); A. Randolph Blough, Deputy Director, Division of Reactor Safety, NRC RI; and Phillip F. McKee, Director, Northeast Utilities Project Directorate, NRC Office of Nuclear Reactor Regulation. The Board developed this assessment for the approval of the Regional Administrator.

The performance category ratings and the assessment functional areas used below are defined and described in NRC MD 8.6.

II. PERFORMANCE ANALYSIS — PLANT OPERATIONS

Plant operations was rated Category 2 in the previous SALP period. Operations management provided very good oversight of operational activities. The number of reactor trips and operator errors was reduced. The Operations Department staff was competent and experienced, and reflected a safety-conscious approach toward plant operations. Operator response to plant transients and off-normal conditions was excellent. Although there was a general improvement in plant operations, significant personnel errors and challenges to operators caused by procedural weaknesses continued to occur.

During this SALP period, operations management involvement and oversight during day-to-day routine operational activities were very effective with strong emphasis on safety regarding operational priorities and safety system performance. The clear focus on safety created an environment within the operations group to question openly potential safety issues. Overall, shift managers displayed excellent safety perspectives throughout the assessment period. In several instances, control room supervisors found, prior to performance, that planned online maintenance activities were not appropriately developed, planned and evaluated. The problems noted revealed lapses in the processes that support performance of online maintenance. Additionally, the overall quality of operations was very good as evidenced by strong operations management involvement, very effective communications in the work control area, good use of procedures, accurate log-keeping, and thorough shift turnovers.

Operations personnel performed strongly with an excellent focus on safety during routine and emergent operational activities and plant transients including two reactor trips during this SALP period. In particular, very good overview of reactor safety and control of critical parameters were maintained throughout the ensuing transient following insertion of a manual reactor trip on June 18, 1995, when non-safety-related power to both electrohydraulic control pumps was lost. This transient presented a significant secondary system operational challenge due to limited balance-of-plant power supply capabilities. Furthermore, operators responded well to the inadvertent high-

energy-line-break protection systems actuation that occurred late in the period. Operators were attentive to plant status and maintained a professional atmosphere with clear communications and self-checking practices. Operations personnel demonstrated their ability to control operational mode changes safely and skillfully, while maintaining excellent control of plant parameters. Control room staff consistently demonstrated effective use of operating, abnormal, and emergency operating procedures. Operator response to several automatic system isolations was excellent, showing strong command and control; this excellent response served to minimize the impact on the plant.

Refueling operations were accomplished with good questioning attitude and in a safe, controlled manner. This was especially evident during first-time operations with reduced reactor coolant system inventory. Operators responded well when the pressurizer surge line filled unexpectedly during evacuation of the reactor coolant system. Strong oversight and coordination, and control of the complex, infrequent operational activities were evident during integrated testing of emergency diesel generators and engineered safeguards systems.

The experienced licensed operations staff was used effectively in other positions of leadership at the plant beyond normal shift coverage such as work control coordinator, in positions within the planning and scheduling organization, and as training instructors. The high-quality operator training program made excellent use of the training simulator. Operator requalification was effective with good management oversight.

The Operations Department had an appropriate safety focus on problem identification and resolution. Overall problem identification capability through normal activities and the self-assessment process was good. Because of strong corrective actions for recurring tagging problems, during the 1994 refueling outage (in the previous SALP period), there were few tagging errors during the 1995 refueling outage. However, in a few cases, operations personnel did not demonstrate a thorough questioning attitude regarding identification and resolution of operational problems. Examples of these cases included a small thermal overpower condition, a reactor vessel level indicating system malfunction, and a foreign material exclusion control problem. One programmatic problem with deficiency tag placement, removal, and tracking was indicative of less than fully effective implementation of a problem-resolution process.

Operations procedures and programs were generally of good quality and were effective. However, in the early part of the assessment period, unrestrained temporary equipment was placed in the control room without using established program controls. Later in the period, when encountering anomalous conditions during integrated emergency core cooling system testing and refueling platform surveillance testing, operators performed actions that were outside the procedure and did not meet management expectations or station procedural adherence guidance. The procedures upgrade program has improved the quality of the procedure, but operations were behind schedule in completing the program.

In summary, operations management provided very effective oversight with a primary emphasis on safety. Operations personnel maintained a clear, safety-

conscious questioning attitude. Control room operations were well controlled with good communications and effective oversight, which resulted in excellent responses to plant transients and to several automatic system isolations. Nevertheless, there were several minor performance-related examples of operations not being completely effective in meeting programmatic and management expectations.

The plant operations area is rated Category 1.

III. PERFORMANCE ANALYSIS — MAINTENANCE

Maintenance was rated Category 2 in the previous SALP period. Because of an experienced and knowledgeable maintenance staff and strong management oversight, maintenance activities were generally safe and well controlled. Material condition of the plant was very good. Surveillance activities were well controlled and excellently performed. The generally excellent performance was marred by occasional failures to adhere to procedures and by some inadequacies in procedures and work control programs.

During this SALP period, corrective and preventive maintenance activities were performed well with significant improvement throughout the assessment period. The conduct of maintenance demonstrated a clear safety focus with strong management and supervisory oversight and involvement. Self-identification and documentation of problems were considerable Maintenance Department performance strengths, and self-assessment initiatives were enthusiastically supported and of excellent quality. The knowledge, skills, abilities, and experience of the maintenance staff continued to be strong. Maintenance performance within the primary containment during power operations was well planned and effectively implemented, and minimized radiation exposures to workers. Highly effective interface and cooperation between the Maintenance Department and other departments, especially during comprehensive emergent safety-related maintenance such as a service water pump replacement, were excellent and consequently served to minimize unavailability of safety system components.

The maintenance backlog is being effectively managed; deficiencies are properly identified, evaluated, prioritized, and resolved, and trends are determined. Additionally, Maintenance Department self-assessment initiatives were noteworthy, showing a strong commitment to using self-assessment in concert with the corrective action process to achieve lasting effective performance improvement.

Procedure usage, including formal procedures and written work instructions, was a strength. Present plant procedures were well maintained. The procedure upgrade program was under way and partially complete; the quality of the newly updated procedures was good.

Overall maintenance program implementation ensured effective performance of work activities. However, performance at times was inconsistent and programmatic weaknesses were evident in the processes for planning, developing, evaluating, and implementing the online maintenance program. Poorly planned steam-flow calibration activities, which were performed on

line, contributed to slightly exceeding the maximum thermal power limit. Further, during performance of online calibration activities involving the power range nuclear instrumentation channels, technical specification action statements were not complied with when the affected channel was not properly placed in the tripped condition within the required six hours. The licensee continued to identify foreign material exclusion (FME) controls program implementation weaknesses but these weaknesses were not effectively resolved.

The maintenance staff performed troubleshooting activities in a well controlled and safe manner, and maintained thorough work documentation. First-line supervisors were knowledgeable about ongoing work and conducted thorough pre-job briefings. In particular, comprehensive work plans were developed to address each anomaly encountered during and following the January 27, 1996, automatic reactor trip and the June 18, 1995, manual reactor trip. For the January 1996 event, the electrohydraulic control system corrective action plan was especially well developed and good configuration control was noted throughout the lifting and landing of test jumpers. For the June 1995 manual reactor trip event, the Maintenance Department demonstrated overall good control of troubleshooting and corrective maintenance, except for a vendor who performed partial arc discharge testing without using approved procedures or other adequate administrative controls. Additional examples of properly performed, well-detailed emergent troubleshooting activities were replacement of safety-grade transmitters in the feedwater level indicating system and the reactor vessel level indicating system. However, later in the assessment period, other troubleshooting activities on the reactor vessel level indicating system resulted in an inadvertent high-energy-line-break systems actuation when a circuit board was replaced.

The work control program improved significantly during the SALP period and these improvements were especially evident during the 1995 refueling outage. The use of a Work Control Center minimized distractions to the operating crew and was a good initiative. Outage management, including planning and scheduling, was a considerable strength that resulted in excellent shutdown risk minimization. During the refueling outage, numerous modification and maintenance activities were performed safely using approved station programs and procedures with good supervisory and management oversight and involvement. Work package documents, including work requests and procedures, were of good quality. However, a vulnerability in the work control process resulted in a near-miss draindown of the secondary side of a steam generator inside the containment. Additional maintenance performance weaknesses, with personnel error as an immediate cause, were evident during the refueling outage. Examples of weaknesses included working on the wrong primary component cooling water system component, wiring a combustible gas control valve motor actuator backwards, and installing an emergency feedwater pump thrust bearing backwards. Notwithstanding the minimal safety significance (since the problems were identified in process or during retesting), the errors collectively indicated weaknesses in the implementation of maintenance on safety-related equipment.

Safety-related surveillance activities were carefully controlled, properly coordinated, and effectively performed. Surveillances were successfully completed using sound work practices that resulted in few unplanned plant

challenges and no reactor trips. Safety-related, risk-significant integrated emergency diesel generator and engineered safeguards system, turbine-driven emergency feedwater pump flow, emergency bus undervoltage, and main steam safety valve setpoint verification surveillances were well controlled, properly coordinated and effectively performed in a step-by-step manner, and testing anomalies were properly evaluated.

In summary, the Maintenance Department made significant improvements during the assessment period through enthusiastic support of self-assessment, problem identification, and problem resolution processes. Strong management involvement fostered the performance of maintenance activities in a safe and controlled manner. Safety-related surveillance activities were carefully controlled, coordinated, and implemented. Notwithstanding, several programmatic weaknesses were evident during planning, development, and implementation of online maintenance which resulted in unnecessary challenges to plant operations. In addition, a vulnerability in the work control process resulting in a near-miss draindown of the secondary side of a steam generator.

The maintenance area is rated Category 2.

IV. PERFORMANCE ANALYSIS — ENGINEERING

Engineering was rated Category 1 in the previous SALP period. Engineering management recommendations to the plant staff on complex technical issues clearly demonstrated a strong safety perspective. Engineering personnel were very knowledgeable in their respective disciplines and in plant areas for which they bore responsibility. Engineering work products were excellent and the engineering support of licensing actions improved. Engineering management evidenced good control of the engineering work backlog. Both the design and technical support engineering organizations performed well in the resolution of significant plant problems; however, in some instances engineering reviews of plant problems were not thorough in the area of root cause determinations.

During this SALP period, the design and engineering personnel continued to control engineering work very well. The Engineering Department demonstrated a strong safety perspective, as evidenced by comprehensive safety evaluations. Engineers communicated very effectively with other plant departments. Systems engineers provided excellent oversight of their systems and compiled comprehensive annual system performance reports. Engineering management evidenced effective control and prioritization of the engineering work backlog except for some minor, longstanding temporary modifications. The operating experience review program was being effectively managed; items were being handled in an appropriate and well-documented manner.

Engineering work products continued to be of high quality, demonstrated good planning, and were supportive of plant operation. The extensive service water piping modification proceeded smoothly, and appropriate considerations were given to possible seismic and external hazards. A modification was effectively implemented to resolve concerns about bolt failures in emergency diesel generator turbocharger housings. The Engineering Department performed comprehensive evaluations of emergent operational issues. Some examples were

the evaluation of potential pressure locking of the containment sump suction valves and the resolution of concerns about oxygen concentration in the main turbine generator water cooling system. However, in some instances during the period, engineering resolutions of some longstanding plant problems were not timely or fully effective. Some examples were recurring equipment problems regarding degraded tubes in the primary component cooling water heat exchanger and vibration in the emergency diesel generator, where engineering's initial root cause evaluations were too narrowly focused. Also, the engineering resolution of the issue concerning non-conservative main steam safety valve setpoints was slow in being implemented.

Well-developed engineering programs and procedures were evident. Good control and assurance of quality for steam generator eddy current testing and inservice inspection programs were demonstrated. A comprehensive monitoring program was in place to evaluate potential Boraflex degradation in the spent fuel pool storage racks. Probabilistic risk assessment methods were being used routinely by engineering personnel to evaluate the impact of maintenance on system work weeks. The program for system engineers to track trends in performance was a strength, and good computer capability was in place to further improve performance monitoring of plant systems. There were some minor shortcomings related to system engineer walkdowns of systems.

The knowledge, experience, and training of design and system engineers continued to be a strength. The engineering staff actively participated in a number of nuclear industry committees and groups. The training program for the engineering staff was well developed and well implemented. Near the end of the period, two experienced managers were transferred from the site and several Seabrook staff engineers participated in temporary assignments to other sites. By the end of the SALP period, it was still too soon to determine if the diversions had affected engineering performance.

In summary, overall excellent performance continued in the engineering area. Engineering demonstrated a strong safety perspective as evidenced by thorough safety evaluations. Knowledgeable engineering personnel, who were active in various nuclear industry groups, were implementing well-developed engineering programs and procedures. Plant design modifications were of high quality. Engineering management demonstrated effective control and prioritization of engineering work backlog. The engineering organization performed comprehensive evaluations of emergent operational issues. However, in some instances, engineering resolutions of some longstanding problems had not been timely or fully effective.

The engineering area is rated Category 1.

V. PERFORMANCE ANALYSIS — PLANT SUPPORT

The plant support functional area covers activities related to the following: radiological controls, emergency preparedness, security, chemistry, fire protection, and housekeeping control.

Plant support was rated Category 1 in the previous SALP period. The plant support functions contributed effectively to safe plant performance. Performance in the radiation protection area was a licensee strength, even though some procedural adherence problems occurred. An aggressive program for keeping radiation exposures as low as reasonably achievable (ALARA) was carried out with significant dose savings realized. A highly effective plant chemistry program greatly helped in maintaining a low radiological source term and in dealing with operations-related problems. Excellent performances in the radiological effluent and environmental monitoring programs were again noted. Performance in the emergency preparedness area continued to be excellent. The security program and the fire protection program were effectively carried out.

During this SALP period, performance under the radiation protection program continued to be a strength. Initiatives were implemented which assisted station workers' ability to keep their exposures ALARA. An example of ALARA aid to workers was the use of alarming dosimeters for each radiologically controlled area entry. Effective implementation of the ALARA program resulted in significant dose savings. Management set aggressive ALARA goals for the refueling outage. The Health Physics (HP), Operations, and Engineering departments responded very effectively to a high contact-dose-rate reading on a reactor cavity drain line during cavity draindown. By effectively working the problem as a team, the organizations were successful in planning and executing activities that significantly reduced the radiation levels and aided in maintaining personnel exposure to as low as reasonably achievable.

Throughout the outage, HP teamwork, supervisory oversight, and comprehensive job coverage were excellent. The amount of radioactive waste generated at the station remained low. In-plant contamination control was excellent. Plant chemistry remained effective in maintaining a low source term. The HP and Chemistry department self-assessments were of overall good quality. Corrective actions were established, as appropriate, and implemented in a timely manner. However, storage locations for radioactive waste had been established within the radioactive waste process building but were not identified in the updated Final Safety Analysis Report (UFSAR), and for which no 10 CFR 50.59 evaluation had been completed.

Performance under the radiological environmental monitoring and effluent control programs continued to be strong. Effective programs for measuring radioactivity in process and effluent samples, as well as an effective program for radiological environmental monitoring, were implemented. The licensee also implemented an excellent projected dose calculation program. Quality assurance audits were thorough and of good technical quality.

During drills and exercises, the staff noted continued excellent performance of the emergency preparedness (EP) program. Effective management support was evidenced by active involvement in the process for controlling plan and procedure changes, the use of experienced personnel outside of Seabrook Station in the audit program, and a well-defined self-assessment program.

The licensee continued to implement an effective security program. Management attention and involvement generally continued at a high level. For example,

the licensee installed hardware upgrades such as new explosive detectors and a hand-geometry biometrics system. Licensee self-assessments were aggressive and effective. However, the NRC identified a program lapse involving behavior observation program provisions for contractors having intermittent assignments on site.

The fire protection function did not achieve the same level of performance as other plant support areas; attributes of the program showed a range of performance from good to weak. Although the program was adequately established and implemented, late in the SALP period, several weaknesses were identified. These involved procedural adequacy and adherence, staff knowledge of program requirements related to control of combustible materials and emergency lighting, and failures to establish compensatory measures for emergency lighting equipment deficiencies.

Housekeeping was typically good and was improving, although exceptions existed in some plant areas.

In summary, the plant support functions contributed effectively to safe plant performance. Performance in the radiation protection area was a licensee strength. Continued effective plant chemistry greatly helped in maintaining a low radiological source term, which contributes substantially to plant maintainability and routine operational activities. Excellent performances in the radiological effluent and environmental monitoring programs were again noted. Performance in the emergency preparedness area continued to be excellent. The security program was effectively carried out. However, NRC found a number of weaknesses in fire protection program implementation, and concluded that fire protection performance, albeit adequate, is not consistent with other plant support functions.

The plant support area is rated Category 1.

Enclosure

PLANNED NRC INSPECTIONS AT SEABROOK

June 15, 1996 to July 1, 1997

INSPECTION PROCEDURE NUMBER	TITLE/ PROGRAM AREA	NUMBER OF INSPECTORS	PLANNED INSPECTION DATE	TYPE OF INSPECTION/ COMMENTS
	OPERATIONS			
N01	Initial Operator Examination	1	9/30/96	PR — For Replacement Operators
	MAINTENANCE			
62700	Maintenance Program Implementation — On-Line Maintenance Review	1	9/01/96	RI — To Review the Online Maintenance when Restarted
73753	Inservice Inspection	1	12/4/1996	CORE — Normal Requirement
	ENGINEERING			
37550	Engineering — Visit 1 (TI 2515/109 Followup on MOVs)	1 Plus Contractor	9/16/96 & 9/23/96	CORE — Normal Requirement Plus Followup of Previous Results
37550	Engineering — Visit 2	2	6/23/97 & 7/7/97	CORE — Normal Requirement
	PLANT SUPPORT			
82302	Review of Exercise Objectives and Scenarios for Power Reactors	1	7/22/96	CORE - Normal Requirement
82301	Evaluation of Exercises for Power Reactors — Full Participation / Region I Play	4	9/16/96	CORE — Normal Requirement
TI 2515/127	Access Authorization	2	10/21/96	SI — To assess implementation of the licensee's program to determine if they are commensurate with regulatory requirements and their Physical Security Plans
81700	Physical Security Program for Power Reactors — Visit 1	1	2/3/97	CORE — Normal Requirement
84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring	1	3/17/97	CORE — Normal Requirement
86750	Solid Radioactive Waste Management and Transportation of Radioactive Materials	1	6/23/97	CORE — Normal Requirement
2515/133	Implementation of Revised 49 CFR Parts 100-179 and 10 CFR Part 71	1	6/23/97	SI — To evaluate reactor licensees' transportation programs for implementing the revised Department of Transportation and NRC regulations for shipments of radioactive materials

Abbreviations:

CORE — Core Requirement
PR — Program Requirement
RI — Regional Initiative
SI — Safety Initiative