ENCLOSURE 1

INITIAL SALP REPORT

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

REPORT NO. 50-443/90-99

NEW HAMPSHIRE YANKEE (NHY)

SEABROOK STATION

ASSESSMENT PERIOD: NOVEMBER 1, 1990 - FEBRUARY 29, 1992

BOARD MEETING DATE: APRIL 13, 1992

TABLE OF CONTENTS

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) is an integrated Nuclear Regulatory Commission (NRC) staff effort to collect observations and data and to periodically evaluate licensee performance on the basis of this information. The SALP process is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. SALP is to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful feedback to the licensee's management to promote quality and safety of plant operations.

An NRC SALP Board, composed of the staff members listed below, met on April 13, 1992 to review the collection of performance observations and data and to assess the licensee's performance at Seabrook Station. This assessment was conducted in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section IV of this report.

This report is the NRC's assessment of the licensee's safety performance at Seabrook Station for the period of November 1, 1990 to February 29, 1992.

The SALP Board was composed of:

Chairman:

W. Hehl, Director, Division of Reactor Projects (DRP)

Members:

W. Lanning, Deputy Director, Division of Reactor Safety (DRS)
J. Durr, Acting Deputy Director, Division of Radiation Safety and Safeguards (DRSS)
W. Butler, Director, Project Directorate I-3, Office of Nuclear Reactor Regulation (NRR)
J. Linville, Chief, Projects Branch No. 3, DRP
G. Edison, Senior Project Manager, NRR
N. Dudley, Senior Resident Inspector, DRP

II. SUMMARY OF RESULTS

II.A Overview

This 16-month SALP encompassed the first operating cycle, the first refueling outage, and four months of the second operating cycle. These activities were characterized by careful planning and safe conservative operations. Management exercised positive leadership throughout the period. There was continued, critical self-assessment and aggressive upgrading of associated activities. Excellent application of risk management studies contributed to plant safety.

The licensee demonstrated superior performance in the Emergency Preparedness and Security areas. Performance in all other areas was rated as good. An improving trend in Maintenance/Surveillance, Engineering/Technical Support, and Safety Assessment/Quality Verification was noted. Management fully supported improvements which resulted in increased reliability and availability of plant equipment. Excellent support was provided to plant operations.

Performance of control room operators was excellent; however, errors outside the control room lead to mispositioning of valves and contamination of the demineralized water system. These auxiliary operator errors and the recently identified deficiencies in log keeping practices of auxiliary operators are of significant concern to the NRC.

Radiological Controls effectively supported plant activities, but program improvements appeared to be needed. Staffing levels provided good support of routine activities; however, work plan changes resulted in intentionally exceeding overtime guidelines for a short period of time during the outage.

II.B Facility Performance Analysis Summary

	FUNCTIONAL AREA	7/1/89 - 10/31/90 CATEGORY/TREND	11/1/90 - 2/29/92 CATEGORY/TREND
1.	Plant Operations	2 Improving	2
2.	Radiological Controls	2	2
3.	Maintenance/Surveillance	2	2 Improving
4.	Emergency Preparedness	1	1
5.	Security	1	1
6.	Engineering/Technical Support	2	2 Improving
7.	Safety Assessment and Quality Verification	2 Improving	2 Improving

III. PERFORMANCE ANALYSIS

III.A Plant Operations

III.A.1 Analysis

This area was previously rated Category 2, improving. Overall, operational performance was very good, with operations being safely performed by a professional and highly motivated staff during a period of significant challenge. Management involvement, training, and independent assessment contributed directly to good performance.

During this assessment period, New Hampshire Yankee continued to operate the reactor plant safely; operators responded proficiently to equipment failures and unplanned reactor trips and the licensee conducted the first refueling outage in an excellent manner. Timely operator action, following failure of secondary system equipment, averted several unplanned reactor trips. Following reactor trips, the operators implemented the Emergency Operating Procedures (EOPs) in a disciplined manner, stabilized plant conditions, and promptly completed appropriate reports to local, state, and NRC officials. During the refueling outage, the licensee effectively implemented risk reduction strategies as identified in the Shutdown Probabilistic Risk Assessment. This was accomplished by continual evaluation of plant conditions during the outage to ensure appropriate safety related equipment was available.

Event evaluation teams conducted thorough reviews of reactor trips and other significant events. Management carefully reviewed the event evaluation reports and restarted the reactor only after the causes of the trips were fully understood and short term corrective actions were completed. Station management stressed the importance of conducting all activities in a cautious and deliberate manner. Management decisions on plant startup from unplanned reactor trips provided the plant staff with sufficient time to fully evaluate plant status. Effective senior and station management oversight of plant operations continued. Senior management routinely toured the plant and was directly involved in resolving major operational issues such as operability determinations for the main feedwater check valves and for the containment isolation valve for the steam supply to the emergency feedwater pump turbine. Operations managers also toured the facility frequently, attended morning shift turnovers, and were present in the control room during major planned evolutions.

The shift superintendents were conservative in determining equipment operability and maintained a strong focus on safety. After entering technical specification action statements, the shift supervisors consulted with operations management, licensing department personnel, and technical support engineers to validate the original operability determinations. The main control room operators were cognizant of and thoroughly reviewed all maintenance activities which could potentially impact plant operations.

The staffing level of shift crews significantly exceeded technical specification requirements which enhanced the ability of the crews to effectively respond to plant events. The work control supervisor position was made a permanent shift crew position which provided an additional licensed Senior Reactor Operator (SRO) to each shift crew. Two highly trained professional fire fighters were assigned to each shift, which contributed to an excellent fire protection program. Maintenance personnel, a chemist, and a clerical aide were also assigned to each crew.

The crews displayed excellent teamwork, communications, and interaction with other station personnel. The interfaces and involvement with personnel from other departments were professional and effective.

Operators normally exercised effective positive control of plant operation; however, several operational errors were noted. In response to these operational errors, the Nuclear Safety Audit Review Committee established an Attention-to Detail task force. Although the number of operational errors decreased as a result of this effort, errors in the conduct of operational tasks outside the control room were still noted. These errors included leaving a locked closed containment instrument line root valve in the open position and failing to verify the restoration of a tagging order. The latter event resulted in contamination of the demineralized water system, a small unmonitored release, and an extensive cleanup effort within the facility. The events indicated a need for improved performance in the conduct of operational tasks outside the control room.

An NRC evaluation of the Emergency Operating Procedures (EOPs), issued at the beginning of the assessment period, determined that the EOPs were technically correct, clearly written, and capable of being effectively implemented. EOP deviations from the Emergency Response Guidelines were corrected in a timely manner. The EOP revision process involved active quality control involvement. Corrective actions taken in response to two unresolved items from the evaluation were thorough and satisfactory.

Management attention towards operator training and requalification was clearly evident. Performance of the twelve candidates for initial licensing examinations was excellent, with no examination failures. The candidates displayed a high level of proficiency and effective communications in the simulator. Eight of eight licensed operators passed the requalification program. Improvements were noted in the quality assurance reviews of the examination, crew communications, and conduct of job performance measures. Training material was adequate, training personnel were cooperative, and techniques for evaluation of the conduct of job performance measures were good. The sample plan for the examination and examination material were of high quality.

Summary

Management was effectively involved in plant operations and the review of operational events. Control room licensed operator responses to plant events were excellent and demonstrated a strong safety awareness. The staffing level of shift crews significantly enhanced the ability of the crews to effectively respond to events. The control room licensed operators were well trained, highly motivated, and displayed excellent teamwork with other station personnel. However, operational errors made outside the main control room were of concern to the NRC.

III.A.2 Performance Rating: Category 2

III.A.3 Board Comment

Immediately after the end of the assessment period, the licensee identified several instances where some auxiliary operators had logged completion of plant rounds that they had not performed during the period. Strong management response to the problem was noted. However, the NRC has not completed its review of the matter.

III.B Radiological Controls

III.B.1 Analysis

The previous SALP rated radiological controls as Category 2. The radiological controls program was effectively implemented. Audits and assessments were considered a strength and indicative of a high degree of management attention and involvement in the radiological controls program. Radiological controls were good but areas for improvement were noted. There was adequate staffing and good training and qualification of personnel. However, weaknesses in the ALARA program and lack of a defined plan for interim storage of radioactive waste were noted. Effective effluent monitoring and REMP programs were implemented.

Radiation Protection

NMY maintained an adequate level of staffing to support routine activities. Early in the period, the working foreman level positions within the radiological controls organization were eliminated to provide more direct interface between technicians and supervisors, thus enhancing communications, a good initiative. There was very good technical support to the program.

The licensee augmented the staff with appropriately qualified individuals to support outage activities. A radiation protection (RP) outage plan was developed that provided a description of the radiation protection organization and its responsibilities. However, during the outage,

a schedule change resulted in simultaneous work on all four steam generators. This outage schedule change had a significant impact on the staff resulting in the extensive use of overtime. About 60% of the staff exceeded the 72 hour guideline for a one week period. No observable negative performance impact resulted from this overtime.

NHY implemented a generally well defined training program for radiation protection personnel that contributed to a good understanding of procedures. There were, however, some NRC-identified weaknesses which were quickly corrected. A remaining weakness involved the initial training program which did not include radiological hazards of plant systems. This weakness deserves management attention to ensure the training and qualification process for radiation protection personnel is comprehensive. The radiation worker training program, in contrast, was well defined and implemented.

During the current period, NHY completed its first refueling outage. Except as noted above, very good planning and preparation for the outage were noted. The health physics staff maintained generally good radiological controls during the outage. Essentially all of the planned work activities received an ALARA review, the scope of which, was commensurate with the expected aggregate personnel radiation exposure. The Unit 2 facility was extensively used for mock-up training, and contractors and on-site staff who were to be involved with potentially high aggregate personnel radiation exposure work activities received extensive mock-up training. Of particular note was NHY's use of a new shutdown technique, (high boron shutdown with subsequent addition of hydrogen peroxide) that resulted in the removal of significant radioactivity from the reactor coolant system. The use of the new technique reflected well on the NHY's efforts to reduce exposure. However, there was no well defined program for generation of ALARA goals. Further, the ALARA planning process did not specifically examine, on a cost benefit basis, review of repetitive tasks and determination of ALARA initiatives that would reduce exposure over the life of the facility, a program weakness. Despite these weaknesses, the licensee exhibited very good ALARA performance during the period.

NHY's audit programs continued to indicate effective management involvement in the radiation protection program. Of particular note were the initiatives to establish a special refueling audit program and the use of an experienced radiological controls auditor to review on-going work activities. NHY also developed a special QA surveillance to audit important aspects of the radiation protection program. There was a good level of management and supervisory presence at work locations inside the radiologically controlled area. The radiological occurrence management program, however, exhibited weaknesses in the thoroughness of evaluation to support identified root causes. The occurrence reports frequently did not contain sufficient detail to properly characterize the actual situation and to correctly identify the root cause.

Several programmatic weaknesses were identified by the NRC prior to the outage, such as weak High Radiation Area access key controls and lack of a defined program to control personnel exposure in high radiation fields that exhibited significant dose rate gradients.

These matters were quickly corrected. Subsequently, a good controls program for external exposure was implemented with no unplanned personnel exposures occurring. These weaknesses were indicative of a possible lack of sophistication in the licensee's audits of the non-outage aspects of the radiation protection program.

Similarly, NHY implemented a good internal exposure controls program. However, NRC noted one weakness involving limited real time monitoring of airborne radioactivity during radiologically significant work activities. The licensee was reviewing this issue at the end of the assessment period. The licensee implemented a good initiative to periodically evaluate the reactor coolant system for changes in radionuclide mix and implement changes in the internal exposure control program. There were no unplanned airborne radioactivity events or personnel exposures in excess of applicable limits.

NRC review of the radioactive material and contamination control programs indicated that a generally good program was implemented to control radioactive material and contamination. The station exhibited very little contaminated floor space. However, weaknesses were identified during the outage which involved potentially inadequate control of contamination during steam generator work activities and inadequate personnel contamination control practices.

Solid Radioactive Waste and Transportation

NHY implemented an effective solid radioactive waste minimization program, including use of an add-on demineralization system to minimize resin waste and numerous actions to minimize dry active waste (DAW), such as volume minimization by sorting and segregating of trash. The relatively small quantities of radioactive waste generated were properly stored, with long term storage of DAW located in the on-site Unit 2 cooling tower building and waste with higher levels of radioactivity stored in the shielded waste process building. These are interim storage areas pending final resolution of the waste disposal issue.

Since NHY was not authorized offsite radwaste burial privileges, no waste for final disposal was transported off-site. Shipments of miscellaneous articles off-site (e.g, laundry for processing and samples for analysis) were performed properly.

An effective training and qualification program as well as a good quality assurance program for radwaste activities have been implemented by the licensee. For example, eleven separate QA surveillance checklists were developed for various solid radwaste processing activities. These checklists provided specific radwaste surveillances to be implemented throughout the operating cycle.

Effluents and Radiological Monitoring Program

NHY implemented an excellent Radiological Environmental Monitoring Program (REMP) for routine and emergency operations. The quality control program was effective in ensuring the validity of the analytical measurements for the REMP samples. Meteorological monitoring systems were properly calibrated and maintained. An excellent routine and emergency radiological effluents contr program was implemented. A notable strength in the program was the NHY staff's outstanding knowledge in the area of normal and non-routine plant releases.

All effluent radiation monitors were properly calibrated and maintained, and safety related air cleaning systems were properly tested and maintained.

The results of the NRC's radiological sample measurements comparison program indicated that all measurements were in agreement with NRC criteria for results comparison. NHY's laboratory QA/QC program and the surveillance activities of the laboratory QC program were noteworthy. QA audits covered stated objectives and were of excellent technical depth to assess the REMP, the effluents control program, and the laboratory QC program. Areas identified for follow-up and recommendations were addressed in a timely fashion.

Summary

In summary, the licensee implemented a good radiological controls program. There was a very good level of management involvement and control of the program, management was supportive of new initiatives and identified problems were properly evaluated and resolved in timely manner. The staff exhibited generally good control over the outage. The overall resolution of technical matters was good and there were no significant enforcement matters identified. Overall, the training and qualification programs were good, with some weaknesses in the training program for radiation protection personnel. Staffing levels provided good support of routine program activities, but last minute changes in scheduling resulted in excessive use of overtime for a short period during the outage. The radwaste packaging and transportation programs were effective. The effluent monitoring and control program and the REMP were excellent. Audits and surveillance were of very good quality.

III.B.2 Performance Rating: Category 2

III.C Maintenance/Surveillance

III.C.1 Analysis

This area was previously rated Category 2. Overall, maintenance by experienced craftsmen resulted in high equipment availability, but deficiencies in maintenance and surveillance programs resulted in performance problems. Program enhancements identified by self-assessments were developed but had not yet been fully implemented.

At the beginning of the assessment period, the licensee reorganized the Maintenance Department and revised the Station Maintenance Manual to address program weaknesses identified by self-assessment reviews. Senior and station management were actively involved in the process to improve the maintenance program. An excellent maintenance program resulted from these efforts; however, some weaknesses were noted in the initial implementation of the program.

Early in the assessment period, the licensee issued the Maintenance Improvement Plan which identified, prioritized, and scheduled improvement activities. Activities completed during this assessment period included: (1) formation and staffing of the maintenance support department, (2) establishment of a predictive maintenance program, and (3) reassignment of non-maintenance tasks. Maintenance facilities were adequate and improvements were initiated to provide hot shops and to expand tool cribs for outage work.

During the first operating cycle, the maintenance department performed a large number of corrective maintenance activities to support plant operations. In spite of the large workload, the maintenance department performed well controlled activities in accordance with procedures. Corrective maintenance actions were clearly documented in the work control packages. Work was well planned and equipment deficiencies identified by surveillance testing were corrected expeditiously.

At the beginning of the first refueling outage, maintenance systems and work practices, developed prior to the outage, were tested and refined. The NRC noted weaknesses in several areas including the lack of formal administrative controls for the master tagout system, inaccurate material control information in work packages, and informal control for the foreign material controls program. Station management initiated effective immediate actions to resolve the concerns which resulted in improvements in these areas.

During the refueling outage, the conduct of maintenance work and the management of shift activities were effectively accomplished. Maintenance procedures were well written and procedure adherence was excellent. Work was completed in a timely manner and supervisory reviews were adequately documented. Supervisors and managers were actively involved with the maintenance activities at the work sites. Planning and response to unanticipated work control problems improved as the outage progressed.

During the second operating cycle, improvement in the implementation of the maintenance program was noted. Activities such as ultrasonic testing of condensate lines and the review of surveillance trends were initiated to enhance equipment performance and improve the effectiveness of plant operations. First line managers and supervisors were directly involved in the daily maintenance activities which contributed to the sustained quality of work.

Maintenance personnel worked closely with technical support system engineers to resolve technical problems and obtain technical guidance. An adequate staff of maintenance personnel, knowledgeable of maintenance practices and the equipment being maintained, was available. Maintenance personnel participation in continuing training increased worker expertise and supported qualifications.

The role of quality control in the maintenance process was a significant strength. The maintenance department incorporated information from reviews and audits performed by the licensee's organization and external groups when evaluating and implementing maintenance department improvements. The station's Integrated Commitment Tracking System was used to track action items to closure. Following the first refueling outage, a comprehensive post outage critique was completed with the results distributed to all departments.

The licensee had an excellent technical specification surveillance program. Well trained and qualified personnel performed the surveillances. However, lack of attention to detail detracted from the licensee's performance in this area as exemplified by an instance which resulted in an inadvertent safety injection signal and the subsequent multiple engineered safety features actuation when performing a surveillance while in cold shutdown.

The inservice inspection (ISI) program was effective. The tracking system for the ISI program was excellent. The system provided current status of examinations and was capable of identifying deviations from program requirements and errors in documentation. The steam generator eddy current test program exceeded the inspection requirements of the technical specifications. The primary and secondary chemistry program was aggressively implemented and complied with industry guidelines and vendor recommendations. Abnormal chemistry conditions which occurred were properly evaluated and appropriate corrective actions taken.

Summary

The maintenance department programs evolved and matured as management supported improvements in the maintenance program and endorsed recommendations made by self assessment studies. Maintenance and surveillance activities were well controlled and implemented with improvements in the planning, coordination, and supervisory oversight. Maintenance was performed by well trained, knowledgeable personnel and resulted in the continued reliability and availability of plant equipment. Refueling outage activities were effectively accomplished. Preventive and predictive maintenance practices were aggressively pursued.

III.C.2 Performance Rating: Category 2, Improving

III.D Emergency Preparedness

III.D.1 Analysis

During the previous SALP, EP was rated Category 1. That rating was based on strong management involvement, an effective staff, prompt resolution of technical issues, an effective training and drill program, and very effective exercise performance.

During this SALP period, upper level licensee managers were actively involved in activities supporting the participation by the Commonwealth of Massachusetts in EP activities, and in the maintenance of the existing Off-Site Response Organization (ORO) qualifications. Management was also directly involved in changes to the Emergency Plan and implementing procedures through the Change Control Team review process, which verified that changes were appropriate and met requirements. EP managers were qualified as members of the Emergency Response Organization (ERO) and the ORO, and participated in drills. The licensee had sufficient qualified people to staff the ERO at least three deep to ensure 24-hour coverage capability. Management also fostered an effective relationship with State, County and local governments through numerous meetings and training sessions, and supported the Commonwealth of Massachusetts in resolving ten mile Emergency Planning Zone (EPZ) community issues and FEMA-identified issues with New Hampshire.

A thorough self-audit was conducted by the Quality Assurance/Quality Control Department. The audit lasted four weeks so that different EP evolutions and drills could be observed. The audit report was reviewed by senior site and corporate management and there was timely correction of areas of concern.

The EP department effectively maintained emergency response facilities through procedures which are described in the Site Support Procedure manuals. They also worked extensively on local Massachusetts EP matters including re-establishment of pole-mounted sirens in the ten mile EPZ.

The licensee performed well in a full participation and in a partial participation exercise. There were no identified weaknesses and previously identified weaknesses were demonstrated to have been corrected. Exercise strengths were excellent command and control, and communications at the emergency response facilities; the ability of the Technical Support Center staff to develop innovative procedures to restore reactor coolant pumps; and effective dispatch and control of damage repair teams by the Operations Support Center.

Training was performed throughout the year as described by the emergency plan and the Emergency Plan Training Program description. Numerous plant drills provided good training to a wide spectrum of participants. The licensee included areas for improvement in preparation of drill scenarios and discussed those areas in thorough post-drill critiques.

The licensee mobilized rapidly in preparation for Hurricane Bob, and responded to the associated severe storm warning for the local area by properly declaring an Unusual Event. The Technical Support staff effectively monitored plant status and directed contingency actions. Sufficient personnel were available to perform all emergency functions, while nonessential personnel were released. Appropriate communications were maintained.

No other events required emergency classification. Initial non-emergency classification of a loss of power to onsite busses was in accordance with station emergency procedures, and the plant operators established a contingency plan for emergency classification if plant response was not as expected. Calls to nearby police and fire departments alerted local communities as part of the licensee's "good neighbor" policy for non-emergency events. Also, in several situations involving worker illness or injury, personnel response and communications were excellent, including one occasion when the plant radio system was out of service for maintenance.

Summary

The licensee maintained a sound and effective EP program, with strong management commitment and involvement being broadly evident. The EP staff was proficient in ensuring readiness for implementation of emergency response; EP training was extensive. Exercise performance showed the ERO staff to be well-qualified. Facilities and equipment were well-maintained. There was extensive support of the Commonwealth of Massachusetts transition to provision of EP measures for Seabrook, and the support of nearby Massachusetts and New Hampshire communities was also strong.

III.D.2 Performance Rating: Category 1

III.E Security

III.E.1 Analysis

The previous SALP rated this area Category 1. That rating was based on a very effective and performance-oriented security program. Management's attention and support for the program were clearly evident by continued emphasis on a high quality program.

During this SALP period, station security management demonstrated a high level of professionalism and technical expertise and continued to provide effective oversight of a security program that has excellent intrusion detection, alarm assessment and contingency response capabilities. Program elements essential in providing a high assurance of station protection were assessed as excellent by an NRC Regulatory Effectiveness Review (RER). The NRC considered the licensee's program to be outstanding.

Corporate management continued to provide excellent financial and technical support for station security measures. Security measures were heightened during the Persian Gulf conflict, safeguards barriers between Units 1 and 2 were completed, and enhancements and upgrades to the security systems, greatly enhanced the performance of the system. In addition, maintenance support for security systems and equipment remained strong.

The licensee continued to conduct aggressive, in-depth and comprehensive audit and self-assessment programs. The programs proved effective in identifying potential program weaknesses and initiating effective corrective actions. In addition, the licensee employed root cause analysis for security events that involved personnel error.

Security management and the security force contractor closely monitored security program activities. Excellent communications and teamwork existed between the licensee and the security force contractor, as demonstrated in the planning process for refueling outage activities.

The initial inspection of the licensee's Fitness-for-Duty (FFD) program determined that the development and implementation of the program were aggressive, comprehensive and directed toward assuring public health and safety. The FFD program facilities, and the professionalism and technical expertise exhibited by personnel involved in administering the program, reflected excellent management support.

Staffing for the security organization continued to be consistent with program needs, as indicated by a lack of problems and the limited use of overtime. During the refueling outage, security officers worked 12-hour work shifts which were within station guidelines. Despite the extended hours, they displayed high morale and remained very professional. Throughout the period, and especially during the outage, good interface and rapport were evident between security and the plant staff.

The licensee continued to maintain a security training program which was well developed and administered by a staff of experienced security professionals. The effectiveness and quality of the training program were apparent by security officers' consistent display of knowledge regarding security objectives, post assignments and responsibilities. In addition, the security force demonstrated well thought-out tactical responses during the RER. Few security events were attributable to personnel error.

Event reporting procedures were clear and consistent with NRC reporting requirements. Only one event required reporting to the NRC during this period; the event involved a security officer's inattentiveness to duty. The licensee's report was clear, concise and indicated appropriate corrective action. Loggable events were appropriately tracked and analyzed, and timely and effective corrective actions taken.

Within this period, the licensee submitted two revisions each to its Physical Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan. The revisions were generally of high quality, technically sound and reflected well-developed policies and procedures.

Summary

The licensee continued to maintain a very effective and performance-based security program. Management support and effective program oversight were evident. The security staff was well trained, professional, and highly motivated. Program improvements were implemented based on aggressive audit and self-assessment programs. Program upgrades and enhancements were indicative of excellent support for the security program from both corporate and station management.

III.E.2 Performance Rating: Category 1

III.F Engineering/Technical Support

III.F.1 Analysis

This area was previously rated as Category 2. That rating was based on improved engineering effectiveness; constructive self and independent assessments; engineering performance during the power ascension test program; and effective root cause analyses for significant problems; but weak root cause analysis for some lesser issues.

During this assessment period, the engineering organization, which includes the corporate design engineering group with support from Yankee Atomic and the onsite technical support engineering group, demonstrated improvement. Management demonstrated good oversight of significant engineering issues by allocating the necessary resources to achieve comprehensive solutions. For example, substantial engineering resources were used to develop and implement the safety related weld reverification project. Challenges to the licensee's engineering performance were readily accommodated, such as the evaluation and corrective actions associated with the Cryofit coupling failure which caused leakage in the reactor coolant system. This evaluation clearly addressed the safety implications of this failure and led to the implementation of extensive modifications, including the instrument tubing and fitting replacement for all areas of the reactor coolant pressure boundary within containment at risk of the failure mechanism.

Noteworthy licensee initiatives were observed, such as the development of a multi-channel, stem mounted strain gauge diagnostic system as part of the Generic Letter 89-10 motor-operated valve (MOV) program. Management support of the MOV program was an observed strength.

The design engineering staff was very knowledgeable and experienced. Their engineering work was performed with support from Yankee Atomic and with minimal outside consultant services except for complex projects, such as the alternate spent fuel pool cooling system

modification. This modification included appropriate consideration of the security and radiological issues of the redesign of the refuel storage building roll-up door. Modification packages were thorough, complete and well controlled. Comprehensive engineering evaluations usually formed the basis for plant modifications. An exception involved the modification to correct a feedwater check valve design deficiency regarding the premature failure of dashpot screws. An initial engineering evaluation which led to the original modification was determined to be inadequate.

Management demonstrated improved control of open engineering items by reducing the backlog by about 30% to approximately 700 items. The licensee's management has established a goal of less than 500 open engineering items by the end of 1992.

The offsite design engineering group continued to make good progress toward the completion of several long-term projects. Four system evaluations were completed in 1991 to support the reliability centered maintenance program initiative. Six design basis documents were also completed to support design basis reconstitution efforts.

The onsite technical support engineers provided excellent support for plant operations. They evaluated equipment performance and controlled temporary modifications from implementation to closeout. In response to NRC Information Notice 89-38 concerning an atmospheric steam dump valve (ASDV) failure, the technical support engineers closely monitored the performance of the ASDVs. Their monitoring provided added assurance of valve reliability. A well planned temporary modification associated with refilling the "A" reactor coolant pump motor bearing oil reservoir was effective in reducing the total associated radiological dose by a factor of about 10.

The technical support engineers were knowledgeable and identified the root causes of plant problems, including minor ones, leading to good resolutions of various technical issues. For example, they conducted walkdowns and implemented modifications in those areas susceptible to the type of vibration induced failure experienced on an air line for a feedwater regulating valve controller. Also, technical support engineers identified the root cause and initiated resolution of a vendor wiring diagram problem associated with the reverse power relays for the diesel generator output breakers. The problem had not been completely resolved in a prior SALP period. Other detailed root cause analyses were aggressively pursued for equipment failures such as the emergency feedwater throttle valves and the containment instrument air compressors. The quality of root cause analyses was a noted improvement from the quality of analyses conducted during the previous SALP period.

The technical support engineering group demonstrated good control of work activities during the implementation of various modifications. Technical support engineers performed well as project managers of complex modifications such as the replacement of SF6 electrical bus duct work and the retubing of the primary component cooling water heat exchangers. Also, they

performed well on simpler projects such as the installation of reactor coolant system level and temperature instruments to support mid-loop operation in accordance with NRC Generic Letter 88-17.

Good management involvement was noted in resolving modification implementation problems. Management took immediate corrective action to alert and train personnel following an incorrect piping cut made during a modification of the emergency feedwater pump turbine steam supply piping. Technical support management subsequently reviewed this problem to determine any required long-term corrective actions.

The engineering reviews supporting several initial submittals to NRC concerning license amendment requests were not comprehensive. For example, in support of a technical specification change to permit operation of a safety injection pump in Mode 5 and 6, the initial engineering evaluation did not fully establish the vent area required to protect against a mass addition transient. Substantial clarifications by NHY were needed to resolve NRC concerns. Similar clarifications were needed for a license amendment to remove RHR isolation valve auto closure.

Feedback from independent self assessments was used effectively. An extensive, documented critique of all major outage projects was conducted, including an emphasis on lessons learned.

Summary

Engineering performance improved. Feedback from independent self assessments was used effectively. Root cause analyses were improved. Good management involvement and controls were evident in the engineering organization. Timely corrective actions were taken when problems were encountered. The offsite design engineering group was effective in preparing plant modifications. Technical support engineers effectively controlled the implementation of modifications. The onsite technical support department provided excellent support for plant operations. However, engineering reviews supporting license amendment requests were not comprehensive and warrant added management attention.

III.F.2 Performance Rating: Category 2, Improving

III.G Safety Assessment/Quality Verification

III.G.1 Analysis

This area was previously rated Category 2, improving. Licensing, self-assessment, and quality assurance activities have been effectively performed. However, identified needed improvements in the maintenance/surveillance, radiological controls, engineering/technical support and plant operations areas had not yet been implemented.

NHY management was actively involved in the direction and oversight of safe operations of Seabrook Station. The Values for Excellence Program, implemented by senior managers prior to full power licensing, has been integrated into all aspects of station operations and has been accepted by managers and supervisors as an established standard of performance. However, recent events indicate the same standard of performance had not been accepted by all workers. The President and Chief Executive Officer held weekly luncheons with randomly selected employees to discuss issues and answer questions. The Executive Director of the Office of Nuclear Production visited the station regularly and was directly involved in the review of significant operational events. Yearly incentive goals were established which were meaningful and challenging with about 65% of the goals being achieved for 1991.

The Independent Safety Engineering Group (ISEG) reduced the backlog of recommendations for safety enhancements that required evaluation. Especially significant were the recommendations to top management for improvements in the NHY incentive goals program. Some of the e recommendations were adopted to ensure that the goals are not a disincentive to nuclear safety.

The Nuclear Safety Audit Review Committee (NSARC) and Station Operations Review Committee (SORC) functioned well in probing station practices, procedures, and problems. The NSARC safety evaluations were thorough, maintained a broad perspective, and resulted in program changes to improve plant safety. Especially noteworthy was NSARC's establishment of the Attention-to-Detail Task Force, which performed a comprehensive review of all personnel errors which occurred during the first operating cycle, determined common root causes, formulated recommendations, developed performance indicators, and tracked the effectiveness of the implementation of corrective actions. The SORC demonstrated a strong safety perspective during reviews of modifications such as changes to the Gammametrics nuclear instruments and containment penetration breakers.

Station management maintained an excellent safety perspective during their evaluation of plant operational events, response to inoperable equipment, and actions taken in response to equipment performance data. The Nuclear Quality Group (NQG) provided an effective oversight and audit function independent from the plant staff.

NQG surveillances and audits were in depth and comprehensive. One audit of note was of the electrical configuration design control of the Emergency Diesel Generator system, which resulted in the generation of several work requests for corrective action. NQG continued to upgrade the expertise of the inspectors, established a Non-Destructive Examination (NDE) group, and began training NDE inspectors. Responses to NQG findings demonstrated NHY's willingness to improve the organization. The quality assurance activities in the areas of maintenance/surveillance, radiological controls, technical support/engineering, and plant operations were improved as is noted in the preceding assessment of those functional areas.

NHY licensing activities demonstrated a strong commitment to meeting regulatory requirements and addressing safety issues. Licensee event reports were timely, complete, and accurate. When special teams were formed to investigate an event, root cause analyses were very good. Responses to NRC Bulletins, Generic Letters, and requests for information were always timely and generally complete. During the first half of the period, license amendment submittals tended to be incomplete technically, requiring considerable interaction and clarification with the NRC staff. Examples include the amendment to permit operation of a safety injection pump in Modes 5 and 6, and the amendment to remove residual heat removal valve autoclosure. The No Significant Hazards Evaluations were also weak. In one amendment application involving repositioning of Rod Cluster Control Assemblies, the initial submittal was inadequate and required revision and resubmittal. As NHY gained experience with license amendments, the submittals improved. In two cases, relief requests were not timely. A well-organized and excellent licensing activities status report was provided on a regular basis. The 10 CFR 50.59 review process was good. Reviews were conducted when required and, in most cases, the reviews were conservative, well supported by analysis, and indicative of a proper safety perspective. All remaining TMI issues were closed out during the assessment period.

NHY submitted an Individual Plant Evaluation (IPE) which provided insights on risk management in assuring defense-in-depth against a variety of accident sequences. The NRC determined that a second level review was not required, and Seabrook was the first plant to receive a completed NRC evaluation of its IPE. Lessons learned from plant specific Probabilistic Risk Assessment (PRA) analyses were used by the licensee in all aspects of plant operations including scheduling of maintenance activities, allocation of resources, and training. The development and use of the Shutdown PRA was especially innovative and effective. The PRAs were maintained as living documents.

Self-assessment activities and evaluations extended beyond program compliance issues. For example, an audit of the management of overtime during the refueling outage identified an apparent misuse of the station overtime guideline procedure. About 60 percent of the health physics staff received management approval to exceed station guidelines, with some working over 90 hours in a seven day period during peak steam generator maintenance activity. Even though no violation of station procedures or adverse consequences occurred as a result of the extensive overtime, the audit questioned management's approval of the overtime.

Initially, the NHY response to NRC inquiries concerning weld radiographs was inadequate. NHY eventually expended extensive resources to verify the adequacy of safety related welds by reviewing all safety related weld documentation for field welds made by the Pullman-Higgins Company. One weld on a low pressure, high temperature diesel generator exhaust line, which was found to not meet code requirements, was determined to be adequate for use as is. Documentation errors and 47 radiographs which did not meet the film sensitivity requirements of the ASME Boiler and Pressure Code were identified. Welds with inadequate documentation were reradiographed and determined to meet code requirements.

Summary

Management efforts continued to foster a positive safety perspective in the organization. Excellent application of the findings of risk management studies improved plant safety. Review committees and NQG inspectors maintained a broad safety perspective. Licensing submittals were initially weak, but improved later in the period. Self-assessment activities were excellent and extended beyond compliance issues.

III.G.2 **Performance Rating**: Category 2, Improving

IV. SALP EVALUATION CRITERIA

Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction or operational phase. Functional areas normally represent areas significant to nuclear safety and the environment. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

The following evaluation criteria were used, as applicable, to assess each functional area:

1. Assurance of quality, including management involvement and control;

2. Approach to the identification and resolution of technical issues from a safety standpoint;

3. Enforcement history;

4. Operational events (including response to, analysis of, reporting of, and corrective action for);

5. Staffing (including management);

6. Training and qualification effectiveness;

Based upon the SALP Board assessment, each functional area evaluated is classified into one of three performance categories. The definitions of these performance categories are:

Category 1: Licensee management attention to and involvement in nuclear safety or safeguards activities resulted in a superior level of performance. NRC will consider reduced levels of inspection effort.

Category 2: Licensee management attention to and involvement in nuclear safety or safeguards activities resulted in a good level of performance. NRC will consider maintaining normal levels of inspection effort.

Category 3: Licensee management attention to and involvement in nuclear safety or safeguards activities resulted in an acceptable level of performance; however, because of the NRC's concern that a decrease in performance may approach or reach an unacceptable level, NRC will consider increased levels of inspection effort.

The SALP report may include an appraisal of the performance trend in a functional area for use as a predictive indicator. Licensee performance during the assessment period is examined to determine whether a trend exists. Normally, this performance trend would only be used if both a definite trend is discernable and continuation of the trend would result in a change in performance rating.

The trend, if used, is defined as:

Improving: Licensee performance was determined to be improving during the assessment period.

Declining: Licensee performance was determined to be declining during the assessment period and the licensee had not taken meaningful steps to address this pattern.