ENCLOSURE 1

FINAL SALP REPORT

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

SALP BOARD REPORT 50-29/89-99

YANKEE ATOMIC ELECTRIC COMPANY

YANKEE NUCLEAR POWER STATION

ASSESSMENT PERIOD:

AUGUST 1, 1989 - JANUARY 15, 1991

MANAGEMENT MEETING DATE: MAY 6, 1991

TABLE OF CONTENTS

SUPPORTING DATA AND SUMMARIES

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to evaluate licensee performance based on data and NRC observations. SALPs supplement the normal regulatory process. They are intended to provide a rational basis for allocating NRC resources and meaningful feedback to the licensee on the NRC's assessment of their performance. SALP criteria are summarized in the Supporting Data and Summaries, Section A.

This report assesses licensee performance at the Yankee Nuclear Power Station from August 1, 1989 through January 15, 1991. An NRC SALP Board, composed of staff members listed below, met on February 26 and March 29, 1991 to assess performance in accordance with NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." The Board's findings and recommendations are forwarded to the NRC Regional Administrator for approval and issuance.

Board Chairman

M. W. Hodges, Director, Division of Reactor Safety (DRS)

Board Members

M. Knapp, Director, Division of Radiation Safety and Safeguards (DRSS)
J. Wiggins, Deputy Director, Division of Reactor Projects (DRP)
W. Lanning, Deputy Director, DRS
T. Koshy, Senior Resident Inspector, DRP
R. Capra, Director, Project Directorate I-1, NRR
P. Sears, Project Manager, NRR

Other Attendees

J. Johnson, Chief, Projects Branch No. 3, DRP
J. Rogge, Chief, Reactor Projects Section 3A, DRP
M. Markley, Operations Assessment Engineer, NRR
M. Miller, Resident Inspector
S. Shankman, Acting Director, Project Director I-3, NRR
R. Bores, Chief, Effluents Radiation Protection Section, DRSS
W. Pasciak, Chief, Facilities Radiation Protection Section, DRSS
E. Gray, Chief, Materials and Processes Section, DRS
C. Amato, Emergency Preparedness Specialist, DRSS
W. Baunack, Senior Reactor Engineer, DRS
S. Wookey, Reactor Engineer, DRP
J. Carrasco, Reactor Engineer, DRS

II. SUMMARY OF RESULTS

II.A. Overall Facility Evaluation

The SALP Board assessment noted overall good safety performance at the Power Station. Strong management involvement in all functional areas Consistent superior performance was evident in Emergency Preparedr program implementation. Radiological Controls continued to impr performance. The Safety Assessment/Quality Verification area r with a declining trend. However, performance in Operations, Engineering/Technical Support functional areas declined.

uperior
perior
eillance, and

The licensee staff responded to an increasing number of was due, in part, to age-related degradation of plant e of personnel errors occurred. Operator response to Deficiencies in operations' procedures conti...ed ' period. The licensee created an Operations Su Licensed operator staffing at the Reactor Op recommended that the licensee aggressivel level.

y systems. This
rease in the number
nmendable.
ring this assessment
ress this weakness.
ginally adequate. The Board
sed licensed operator staffing

The overall quality of maintenance demonstrate a high level of pride problems in the licensee progra noted.

as good. Personnel continued to
the quality of work performed. How..
ation and post-maintenance testing were

Engineering and Technic provide technical supr the lack of appropri

enerally good. The corporate staff cont...ed to
and outages. However, deficiencies were noted in
operability determination for corrective maintenance.

The quality of licensee tech integrity a decrease

d safety evaluations was good. Initial reviews by the
organizations and independent evaluators for reactor vessel
cient technical basis. An untimely reaction to indicators of a
gins for important equipment was also noted.

The a

ed that the licensee perform a comprehensive assessment of the
provided to current plant activities such as the effectiveness of the
maintenance testing program to assure that resource allocations are
that the appropriate level of quality is being achieved. The results should be
n NRC management.

SEE AMENDED PAGE
REGIONAL ADMINISTRATOR

II. SUMMARY OF RESULTS

II.A. Overall Facility Evaluation

The SALP Board assessment noted overall good safety performance at the Yankee Nuclear Power Station. Strong management involvement in all functional areas was evident. Consistent superior performance was evident in Emergency Preparedness and Security program implementation. Radiological Controls continued to improve and achieved superior performance. The Safety Assessment/Quality Verification area performance was superior with a declining trend. However, performance in Operations, Maintenance/Surveillance, and Engineering/Technical Support functional areas declined.

An increase in the number of personnel errors occurred. Operator response to transients was commendable. Deficiencies in operations' procedures continued to be identified during this assessment period. The licensee created an Operations Support Group to address this weakness. The Board recommended that the licensee aggressively pursue an increased licensed operator staffing level.

The overall quality of maintenance and surveillance was good. Personnel continued to demonstrate a high level of pride and ownership in the quality of work performed. However, problems in the licensee program for post-modification and post-maintenance testing were noted. An increase in the frequency and significance of equipment problems occurred.

Engineering and Technical Support were generally good. The corporate staff continued to provide technical support for operations and outages. However, deficiencies were noted in the lack of appropriate evaluations for operability determination for corrective maintenance.

The quality of TS amendments and safety evaluations was good. Initial reviews by the licensee technical staff, quality organizations and independent evaluators for reactor vessel integrity analysis lacked sufficient technical basis. An untimely reaction to indicators of a decrease in the design margins for important equipment was also noted.

The Board recommended that the licensee perform a comprehensive assessment of the adequacy of support provided to current plant activities such as the effectiveness of the post-modification/maintenance testing program to assure that resource allocations are appropriate such that the appropriate level of quality is being achieved. The results should be discussed with NRC management.

II.B. **Facility Performance**

Functional Area		4/1/88-7/31/89 Category/Trend	8/1/89-1/15/91 Category/Trend
1.	Plant Operations	1	2
2.	Radiological Controls	2/Improving	1
3.	Maintenance/Surveillance	1	2
4.	Emergency Preparedness	1	1
5.	Security and Safeguards	1	1
6.	Engineering and Technical Support	1	2
7.	Safety Assessment/Quality Verification	1	1/Declining

I' PERFORMANCE ANALYSIS

III.A. **Plant Operations** (1311 hours, 24.4%)

III.A.1 **Analysis**

The previous SALP rated this area Category 1, with a consistently high level of performance that reflected active and positive influence of management in day-to-day activities. The assessment noted weakness in the quality of operational procedures and staffing in operations support functions.

Plant activities during routine plant operation, planned and forced shutdowns were reviewed during this assessment period. The operations staff responded well to multiple plant events, equipment anomalies and failures. During power operation, operators demonstrated noteworthy skills in response to transients. Immediate operator response to two turbine control valve events averted unnecessary plant transients. Additionally, operator response to a false indication of a reactor trip annunciation without control rod movement during startup control rod testing was commendable. A total of two automatic reactor scrams and three safety system actuations occurred. An operator error resulted in an automatic reactor scram and isolation of the main steam line non-return valves (NRVs). This scram was due, in part, to a known problem in the man-machine interface of a control switch and to a procedure deficiency. A drawing deficiency contributed to an isolation of station control air and resulted in a reactor scram on low steam generator level. An operator error in breaker alignment resulted in the inadvertent automatic start of an emergency diesel generator.

Operators demonstrated a sound understanding of plant systems and responded effectively to Technical Specification (TS) limiting conditions for operation. Appropriate management review and decision making was consistently noted. Station management oversight of routine plant operation continued to be a strength. Management was actively involved in the technical resolution of plant events.

The operations staff was consistently knowledgeable of plant conditions and ongoing maintenance and surveillance activities. Shift turnovers and documentation adequately characterized operating history and off-normal conditions. Operator alertness and attentiveness were routinely observed during day shift and backshifts. One noted exception occurred during the refueling outage when the operators did not recognize the lack of an audible source range monitor tone in the control room.

The licensee's operator training program was effective. The licensee attained a 100% pass rate for all individuals examined by the NRC. This included five initial SRO and three requalification reexamination candidates. The reexamination candidates had failed tests during the previous assessment period. The licensee appropriately removed those individuals from shift responsibility until satisfactory performance was achieved. It was evident that an appropriate amount of remedial training had been devoted towards upgrading the performance of individuals. Significant site management involvement was noted in licensee training effectiveness. This was demonstrated by the establishment of an annual training self assessment program; the weekly Training Advisory Committee meetings; and the overall

conservative direction taken during requalification examinations. A plant-specific s
was delivered in December 1990 with no apparent problems. This accomplishme
indicative of strong management involvement in its development. Review of o
noted effective presentations with a high level of class participation and share
In contrast, training for SPDS design change upgrades lacked the same lev
providing information for the use of critical safety function (CSF) status
promptly corrected this deficiency.

see

Operator staffing level was minimally adequate. The licensee cha
hour rotation schedule during this assessment period. No defici
of this change. The licensee had been successful in upgradin
SRO status. At the close of this assessment period, 18 indi
operator (SRO) licenses and 10 individuals held reactor o
had scheduled training classes to increase the number o
ten. Some training staff members hold active license
exchanged with the operations department to maint
with SROs occasionally filling RO shift duties.

t twelve-
as a result
viduals to
reactor
ses. The licensee
ROs by eight to
e staff and they were
O staffing was marginal

An inspection in November 1989 determine
of symptom based Emergency Operating
were well written and operators were a
However, the technical adequacy and
was determined to be marginally a
memory for component location

s program for the development
was excellent. The procedures
ectively during the NRC inspection.
ormal Operating Procedures (AOPs)
ed excessive reliance on operator
eration.

SEE AMENDED PAGE

REGIONAL ADMINISTRATOR

In response to the June 198
initiated an Operations Su
time of the November
procedural deficienci
inspection, the licer
established sched
assigned an op
group. The
group. S
perform
respo
ope
d

cation examination failures, the licensee
grade operations department procedures. At the
on, the group had not been fully staffed and
ctively addressed. At the conclusion of the EOP
complete a procedure upgrade program with an
. A reorganization at the end of the SALP period
id one additional staff member in the operations support
ed on procedure improvements through the operations support
review during day shift and backshift hours noted operators
ews, walkdowns and verifications. Although not initially
ons were ultimately effective in improving the overall quality of
. A followup inspection to the EOP findings determined that the
s had been corrected.

program implementation was generally good. Fire protection and mitigation
well maintained. Compensatory action for degraded or inoperable fire control
as timely and appropriate. Only minor deviations in personnel performance were

ing this assessment period, the licensee initiated programs to improve the physical
ondition and appearance of the plant. The licensee installed new roofs on a number of plant
structures. Also, an aggressive painting program resulted in many floor surfaces being

conservative direction taken during requalification examinations. A plant-specific simulator was delivered in December 1990 with no apparent problems. This accomplishment was indicative of strong management involvement in its development. Review of outage training noted effective presentations with a high level of class participation and shared knowledge. In contrast, training for SPDS design change upgrades lacked the same level of quality in providing information for the use of critical safety function (CSF) status blocks. The licensee promptly corrected this deficiency.

Operator staffing level was adequate. The licensee changed to a five-shift twelve-hour rotation schedule during this assessment period. No deficiencies were noted as a result of this change. The licensee had been successful in upgrading RO licensed individuals to SRO status. At the close of this assessment period, 18 individuals held senior reactor operator (SRO) licenses and 10 individuals held reactor operator (RO) licenses. The licensee had scheduled training classes to increase the number of SROs by six and ROs by eight to ten. Some training staff members hold active licenses to supplement the staff and they were exchanged with the operations department to maintain their skills.

An inspection in November 1989 determined that the licensee's program for the development of symptom based Emergency Operating Procedures (EOPs) was excellent. The procedures were well written and operators were able to use them effectively during the NRC inspection. However, the technical adequacy and usefulness of Abnormal Operating Procedures (AOPs) was determined to be marginally adequate and required excessive reliance on operator memory for component location and equipment operation.

In response to the June 1989 operator requalification examination failures, the licensee initiated an Operations Support Group to upgrade operations department procedures. At the time of the November 1989 EOP inspection, the group had not been fully staffed and procedural deficiencies were not being actively addressed. At the conclusion of the EOP inspection, the licensee committed to complete a procedure upgrade program with an established schedule for completion. A reorganization at the end of the SALP period assigned an operations director and one additional staff member in the operations support group. The licensee had focused on procedure improvements through the operations support group. Subsequent inspector review during day shift and backshift hours noted operators performing procedure reviews, walkdowns and verifications. Although not initially responsive, licensee actions were ultimately effective in improving the overall quality of operations procedures. A followup inspection to the EOP findings determined that the deficiencies in AOPs had been corrected.

Fire protection program implementation was generally good. Fire protection and mitigation systems were well maintained. Compensatory action for degraded or inoperable fire control barriers was timely and appropriate. Only minor deviations in personnel performance were noted.

During this assessment period, the licensee initiated programs to improve the physical condition and appearance of the plant. The licensee installed new roofs on a number of plant structures. Also, an aggressive painting program resulted in many floor surfaces being

repainted. However, transient equipment storage and housekeeping irregularities
throughout the assessment period. Of particular concern was the volume of un
equipment in the vapor container (VC) during plant operation. In addition to
storage, a temporary wooden scaffold remained installed in the pressurizer
operating cycle. Licensee corrective measures included replacing the tem
a permanent structure, securing, and removing some equipment. The
this equipment inside the VC due to the limited space in plant storag
entire facility was not seismically qualified, equipment storage pra
reflect a conservative operating philosophy.

In summary, the licensee demonstrated generally good perfo
involvement was considered a strength and was particular
plant-specific simulator. Although operator response to
increase in the number of personnel errors occurred.
marginal, particularly on the RO level. Deficiencie
be identified during this assessment period. The
Group to address this weakness and other supp
the VC did not reflect a conservative operati

III.A.2 **Performance Rating:** C

III.A.3 **Board Recommenda**

The licensee should aggressivel ae an increased licensed operator staffing level.

SEE AMENDED PAGE

REGIONAL ADMINISTRATOR

III.B. **Radiological C** s, 8.1%)

III.B.1 **An**

The Radiolog ram at Yankee Nuclear Power Station was rated Category 2,
Improving s assessment period. Management oversight of the program was
comprehe e. However, continued attention to the assessment of radiological
incider root cause analyses and corrective actions was warranted. The
licen nsive to self-identified concerns throughout the assessment period.
Th ification program was generally effective. A few significant operational
staffing levels of licensee personnel and temporary contractor technicians
during periods of routine operations and refueling activities. The
fluent control and monitoring and transportation programs were considered

ogical Controls

e Radiation Protection (RP) Department continued to be staffed with highly experienced and qualified personnel throughout the assessment period. Licensee personnel and temporary contractor technician staffing levels were appropriate during both routine operations and

repainted. However, transient equipment storage and housekeeping irregularities were noted throughout the assessment period. Of particular concern was the volume of unsecured equipment in the vapor container (VC) during plant operation. In addition to equipment storage, a temporary wooden scaffold remained installed in the pressurizer cubicle during the operating cycle. Licensee corrective measures included replacing the temporary scaffold with a permanent structure, securing, and removing some equipment. The licensee kept much of this equipment inside the VC due to the limited space in plant storage areas. Although the entire facility was not seismically qualified, equipment storage practices in the VC did not reflect a conservative operating philosophy.

In summary, the licensee demonstrated generally good performance. Management involvement was considered a strength and was particularly evident in the development of the plant-specific simulator. Although operator response to transients was commendable, an increase in the number of personnel errors occurred. Deficiencies in operations' procedures continued to be identified during this assessment period. The licensee created an Operations Support Group to address this weakness and other support functions. Equipment storage practices in the VC did not reflect a conservative operating philosophy.

III.A.2 **Performance Rating**: Category 2.

III.A.3 **Board Recommendations:**

The licensee should aggressively continue to pursue an increased licensed operator staffing level.

III.B. **Radiological Controls** (434 hours, 8.1%)

III.B.1 **Analysis**

The Radiological Controls Program at Yankee Nuclear Power Station was rated Category 2, Improving during the previous assessment period. Management oversight of the program was comprehensive and effective. However, continued attention to the assessment of radiological incidents, effectiveness of root cause analyses and corrective actions was warranted. The licensee was very responsive to self-identified concerns throughout the assessment period. The training and qualification program was generally effective. A few significant operational events occurred. Staffing levels of licensee personnel and temporary contractor technicians were appropriate during periods of routine operations and refueling activities. The radiological effluent control and monitoring and transportation programs were considered strong.

Radiological Controls

The Radiation Protection (RP) Department continued to be staffed with highly experienced and qualified personnel throughout the assessment period. Licensee personnel and temporary contractor technician staffing levels were appropriate during both routine operations and

planned outages (such as refueling activity periods). Yankee Atomic Electric Company (YAEC) effectively augmented its outage supervisory RP staff with individuals from the corporate office. This upgrade resulted in effective supervisory oversight throughout the outage. However, RP non-supervisory staffing levels for forced outage periods were noted as a weakness. The licensee evaluated augmenting the staff during future unplanned activity periods and has developed a contingency plan.

The licensee's independent audit program was considered excellent. Audits were conducted by well qualified individuals from the licensee's corporate office and RP supervisors from other nuclear facilities. The licensee's response to audit findings was prompt and corrective actions appropriately addressed the audit findings. The licensee's Radiological Occurrence Reports (RORs) program was revised to generate quarterly summaries of personnel contamination events and included further review by upper management. These upgrades effectively addressed a weakness noted previously in the licensee's conduct of comprehensive root cause analysis for RORs.

The licensee continued to maintain an effective training and qualification program. The licensee improved its training program by administering a diagnostic test to the permanent Radiation Protection Technicians. The testing results allowed the training department to focus on areas where specific training was required. However, in the latter part of the assessment period, two minor weaknesses were noted by NRC: one in the qualifications of the individual providing respiratory protection training, and another in the training given to RP personnel regarding the proper interpretation of continuous air monitor results. Overall, the training program was determined to be comprehensive and effective.

The external exposure program was generally well implemented and maintained. Radiological work controls implemented by the radiation protection staff were superior. A concern was identified by NRC during the latter part of this assessment period regarding the frequency for source checking survey instruments. Area postings and controls for radiological protection purposes were considered good, with only one instance of an improper posting being observed.

The licensee had an effective program for evaluating and minimizing personnel exposures to airborne radioactive material. The licensee purchased state-of-the-art respirator fit test equipment to ensure proper respirator selection and to facilitate personnel respirator qualification.

The licensee had made significant upgrades in their ALARA program. For example, the licensee's program for estimating and tracking personnel exposures had improved during this assessment period. ALARA controls for the extended outage were excellent. Significant reactor vessel work associated with the conoseal repairs and efforts to relatch the uncoupled control rod were completed with limited occupational radiation exposure. Superior engineering controls enabled the workers to perform these activities without the use of respirators. One noted exception to this level of performance was the use of a manual lapping device for reactor coolant pump repairs.

Radiological Environmental Monitoring Program (REMP)

The licensee had in place an effective REMP, including in-depth audits and effective follow-up on identified deficiencies, accurate annual reporting, effective quality assurance of the analytical laboratory, and a good meteorological monitoring program. Some backup meteorological recording instrumentation had persistently drifted out of tolerance for the wind speed, wind direction and temperature parameters. However, this appears to be an isolated problem. Licensee performance of the REMP was evaluated as excellent.

Radiological Effluent Monitoring Program

Effective radioactive liquid and gaseous effluent monitoring and control programs were in place. Quality assurance audits appeared to be thorough and of good technical depth to assess the effluent control program and the Off-site Dose Calculational Manual. Radioactive liquid and gaseous release permits met Technical Specification requirements. Calibrations of the effluent and process monitors were within the licensee's acceptance criteria and consistent with industry standards. Air cleaning systems and test results were within the licensee's acceptance criteria, however, some management reviews were not completed in a timely manner. Overall licensee performance of the effluent control program was considered to be excellent.

Radwaste and Transportation

The licensee had an effective program for the packaging and transportation of radioactive materials. The quality assurance of radwaste shipments was determined to be excellent. The initial training and retraining of plant staff involved in the processing, packaging and shipment of radwaste were also considered excellent.

Summary

The Radiation Protection (RP) Department continued to be staffed with highly experienced and qualified personnel. The licensee's independent audit program was considered excellent. The licensee continued to maintain an effective training and qualification program. The licensee had in place an effective radiological environmental monitoring program. Effective radioactive liquid and gaseous effluent monitoring and control programs were in place. The licensee had an effective program for the packaging and transportation of radioactive materials. Licensee ALARA and radiological work controls for outage activities were superior.

III.B.2 **Performance Rating:** Category 1.

III.B.3 **Board Recommendation:**

None.

III.C. **Maintenance/Surveillance** (1780 hours, 33.2%)

III.C.1. **Analysis**

The previous SALP rated performance in the Maintenance/Surveillance area as Category 1. Although some personnel errors occurred, a consistently high level of quality of maintenance and management oversight was observed. The surveillance program continued to be a licensee strength. Weakness was noted in that maintenance requests were occasionally unclear in characterizing deficiencies thereby resulting in untimely resolution. Also, quality verification observations and recommendations occasionally did not receive appropriate attention by the line organization.

During this assessment period, licensee performance was good. Personnel continued to demonstrate a high level of ownership and pride in completing maintenance and surveillance tasks. An increasing number of deficiencies was noted in the management of corrective maintenance programs.

The Maintenance Team Inspection noted generally well functioning programs, maintenance and surveillance management maintained a highly visible role in prioritizing, scheduling and performing daily activities. Excellent communication was evident within the plant and with the corporate staff. No deficiencies in staff training and qualification were observed. Quality control coverage was adequate. However, a need to improve management and quality control attention to general material conditions was noted in the number of minor deficiencies observed, such as missing and inadequate torquing of equipment fasteners. The work control program was adequately documented and well implemented with sufficient detail in characterizing deficiencies. However, improvement was needed in administrative and managerial controls to track and control the maintenance backlog and the formalization and documentation of the equipment failure analysis program. The licensee did not have a procedure for tool control and the methods to control tools were limited. The licensee demonstrated good initiative in redesigning the non-radiological maintenance shop for more efficient use of available space. Although the control of electrical and I&C maintenance and test equipment (M&TE) was good, mechanical M&TE was found to be inadequate. Corrective actions were implemented by the end of the inspection.

Licensee actions for safety injection tank leakage in 1984 and for the first identified crack detected in 1988 were weak in that the failure mechanism and extent of degradation were not established. Licensee response to leakage when identified in January 1990 was prompt and conservative. The corporate staff provided timely technical and safety evaluations. Licensee action to replace the aluminum tank with a stainless steel model of greater capacity demonstrated a strong orientation toward safety.

The licensee maintenance staff effectively controlled contractor construction of the new safety injection tank. Appropriate management oversight and quality control was routinely observed during the concrete pours, plate welds including weld material control, and the installation of instrumentation. Problems during pipe welding required some rework. Quality assurance

measures were effective in identifying these deficiencies and rectifying the root causes. Deficiencies noted in QA program implementation received appropriate attention by the line organization and management.

During normal operation, maintenance and surveillance staffing seldom relied on contractor support. The August 1989 forced maintenance outage demonstrated an adequate level of expertise within the staff to complete significant unplanned maintenance in support of plant operations.

The core XXI refueling outage was initially scheduled for a seven week duration. Significant equipment problems resulted in the outage lasting eighteen weeks. This included replacement of the emergency diesel generators, repair of a leaking incore detector conoseal spire and significant maintenance to correct an unlatched control rod. Overall licensee performance was good.

The licensee's post-maintenance testing (PMT) program generally provided adequate assurance that plant equipment will perform satisfactorily in service. A noted exception to this was PMT implemented for the emergency diesel generators (EDG). Following outage overhaul the licensee returned two of the EDGs to service using the operations department monthly surveillance test at half the required capacity. When the 18-month surveillance test was performed at full capacity, the licensee realized the emergency diesel generators did not have adequate capacity to support emergency loads for certain plant conditions. Inadequate post-maintenance electrical restoration verification also rendered one of the containment emergency recirculation fans inoperable.

Additional examples of inadequate performance were observed. Early in the assessment period, inadequate personnel knowledge of program guidance resulted in the installation of non-conforming fasteners on the charging pump strainers. The charging pumps were placed in service prior to addressing the hold tags. Corrective action for emergency lighting failures during fire protection surveillance testing did not preclude repetition of failures.

Physics testing, performed during startups, was closely coordinated with reactor engineering, operations, instrumentation and controls, and maintenance personnel. Personnel actions and the technical resolution of the uncoupled control rod were good.

The steam generator Inservice Inspection program was considered effective. Licensee examination of potential defects in the pressurizer, reactor vessel head, and steam generator girth welds was good. Snubber testing was effective with appropriate actions taken for snubbers that failed requisite testing. Maintenance personnel continued implementing the predictive maintenance program through active vibration monitoring and trending.

In summary, the licensee was effective in addressing issues identified in the previous SALP. Some personnel errors were noted. However, the overall quality of maintenance and surveillance was good. Maintenance and surveillance personnel continued to demonstrate a high level of pride and ownership in the quality and results of their work. An increase in the frequency and significance of equipment problems occurred. Management effectively

addressed needs to upgrade equipment for identified concerns. The licensee did not focus adequate attention on needed improvements in the program for post-maintenance testing and equipment restoration following maintenance.

III.C.2. **Performance Rating:** Category 2.

III.C.3. **Board Recommendation:**

The one recommendation pertaining to this functional area is contained in Section III.G.3.

III.D. **Emergency Preparedness** (321 hours, 6.0%)

III.D.1. **Analysis**

The previous SALP report rated Emergency Preparedness as Category 1. This rating was based on good licensee performance during the exercise, good management support of the emergency preparedness program and an improved emergency preparedness training program.

Corporate and site management continued to maintain effective involvement in emergency preparedness activities. In addition to management techniques based on defined procedures, two other tracking tools were used to monitor the program. The "other tools" were a Commitment Tracking Test, a copy of which went to the YAEC president, and an Action Plan which tracked licensee and NRC EP concerns. The level of management involvement was demonstrated by the following: managers maintained Emergency Response Organization (ERO) position qualification; they were required to review and approve emergency plan and implementing procedure changes; they regularly participated in drills and exercises; and they interfaced effectively with Commonwealth of Massachusetts and Vermont State government personnel. Further, emergency plan and implementing procedures were reviewed and approved by the plant operating review committee. Explicit administrative procedures for the distribution and control of emergency plan and implementing procedures have been developed and were implemented.

During the 1990 exercise, YAEC demonstrated resolution of a problem involving information flow between the Emergency Response Facilities that had been identified in previous exercises. The problem involved an apparent lack of plant status information flow between emergency response facilities and its appropriate and timely display in the emergency operations facility.

The licensee responded to three operational events each of which involved reactor coolant system leakage. The events were properly identified, analyzed and classified as Unusual Events. Notifications to the State and other outside agencies were timely.

Staffing of the emergency response organization has further improved following the development of the Staff Augmentation Plan which provides three qualified individuals for each ERO position. Site and Yankee headquarters personnel filled the positions. Slightly more than 200 personnel are assigned to fill the 63 emergency response positions. There are

no duplicate assignments and no person assigned a headquarters emergency function was assigned to a Staff Augmentation Plan position. Expertise was available within the staff. Positions were identified and their responsibilities were defined in the emergency plan.

Overall, the emergency preparedness training program continued to improve, was well defined and effective. Additional improvements have been made based on exercise and actual event response observations. Training made a positive contribution to emergency preparedness effectiveness. A task analysis had been completed upon which a training matrix and lesson plans were based. The task analysis identified needed skills and knowledge. In addition to classroom training, there were frequent drills of various types. Licensed operators were trained in classification and protective action recommendation development. The effectiveness of operator training was demonstrated during the full-participation exercise and the response to three actual events.

Strong management support of emergency preparedness continued, and was demonstrated by the following activities. Management was involved with off-site plan development and coordination. Biweekly meetings with Commonwealth personnel and quarterly meetings with Vermont officials were held. One emergency preparedness program staff member met almost on a daily basis with Town officials. Public information material was developed and distributed. Siren availability exceeded Federal Emergency Management Agency (FEMA) specifications. Tone Alert Radios were in wide spread use. The FEMA preliminary evaluation of the 1990 full-participation exercise indicated no deficiencies. This evaluation was indicative of the extensive resources the licensee had dedicated to this activity.

In summary, the licensee maintained an effective emergency preparedness program. Management was involved and consistently demonstrated a commitment to quality. The emergency response organization was fully staffed. Training was effective as demonstrated by the full-participation exercise response and the response to three actual conditions requiring classification. The licensee maintained a good interface with Commonwealth, State and Town officials.

III.D.2. **Performance Rating**: Category 1.

III.D.3 **Board Recommendation:**

None.

III.E. **Security and Safeguards** (289 hours, 5.4%)

III.E.1. **Analysis**

During the previous assessment period, the licensee's performance was rated Category 1. That rating was based on implementation of an effective security program that had management attention and support. Four areas were identified where additional management attention could further enhance program effectiveness. These were: additional technical and

supervisory training for proprietary personnel; upgrading/replacement of aging equipment; improving training facilities; and ensuring nuclear security expertise on audit and assessment teams.

During this period, plant and corporate management support for the security program continued and was particularly evident with regard to the program enhancements. The security manager continued to take initiatives designed to improve their sound, performance-based program. For example, the licensee added one proprietary and one contract supervisor on each shift to provide more effective oversight of the security force and additional supervision in the event of a contingency. Another proprietary supervisor was added to the staff to provide on-shift training as necessary. In addition, the security force began training in the use of Multiple Integrated Laser Engagement System (MILES) equipment to be used during tactical exercises conducted at the station.

Security management continued to actively participate in industry groups engaged in nuclear plant security matters and actively interfaced with area law enforcement agencies to maintain good working relationships. In addition, the licensee hosted a marksmanship competition with several other nuclear plant security forces in the Region I area.

Management attention to the program was evident in upgrades to security equipment and programs. Upgrades were made in computer software, handguns, exit detection systems for badges and keys, vital area barriers, and key card readers. Program enhancements included increased attention to and facilities for staff training; increasing the response force staff; cross-training of proprietary security staff as shift supervisors; frequent surveillances to enforce access controls and other security requirements; and providing career paths for members of the force. Late in the period, the licensee took prompt action to develop a comprehensive contingency plan to deal with a potential security force strike. Management was prompt in issuing an emergency schedule for non-union staff, acquiring backup officers, and training additional resources to meet long-term needs, if necessary.

During this assessment period, weaknesses were identified by NRC in weapons training, in protected area detection and assessment aids, and in vehicle searches. The licensee promptly took action to correct these weaknesses. The licensee also reorganized its security training and qualification program to formalize its structure and increase its effectiveness. The security training and qualification program was transferred to the licensee's Training Department, with the proprietary security training officer reporting to the Maintenance and Technical Training Supervisor, assisted by one full-time licensee and one full-time contractor security trainer. A permanent classroom in the licensee's training facility was also provided. In addition, proprietary shift supervisors were assigned, on a part-time basis, to assist in the training efforts. This action by the licensee demonstrated its commitment to an effective and performance-based security program. The licensee also provided supervisors with training in tactical response, maintenance and repair of small arms, explosive ordnance disposal (EOD) and bomb recognition, and power plant operations. Licensee effort to improve and expand the training program were commendable.

Staffing of the security force was consistent with program requirements. The amount of overtime required to support the program was consistent with station guidance and was not excessive. Security force members were knowledgeable of their job requirements and demonstrated a professional demeanor. The allocation of additional supervisory personnel and the improvements made in the training and requalification program were further evidence of management support for the security program and resulted in a minimal number of personnel errors during the period. The licensee also continued to hire contract security force personnel to fill openings in its proprietary organization, thereby providing a career employment opportunity for members of the contract force.

During this assessment period, the licensee implemented a Fitness-for-Duty (FFD) program in response to NRC requirements. The program development and implementation were found to be responsive to the NRC's FFD rule was an improvement over the prior programs. Adequate resources had been applied and an effective audit program was in place. The licensee effectively identified programmatic weaknesses and implemented appropriate corrective measures.

The licensee continued the use of self-assessments in order to identify potential weaknesses and opportunities for improvement. The NRC-required annual audit of the security program was performed by the licensee's quality assurance group, assisted by security personnel on loan from other nuclear plants. The use of qualified personnel with security expertise appeared to improve the effectiveness of the audit, as it was very comprehensive in scope. Corrective actions taken on findings and recommendations identified during the annual audit, and during the frequent self-assessments, were prompt and effective with adequate follow-up to ensure their implementation.

Review of the licensee's security event reports and reporting procedures found them to be clear and consistent with NRC regulations, and implemented by personnel knowledgeable of the reporting requirements. Six events were reported during the assessment period: three involved personnel access control problems; one resulted from an injured security officer; and two involved equipment failure. None of these events were determined to be a programmatic or recurrent. The licensee's action in each case was prompt and appropriate, and reflected the proper degree of management oversight.

In summary, the licensee continued to maintain an effective, performance-based security program and strived to improve it further. Management attention, as indicated by the extensive implementation of enhancements, improvements in the training and audit programs, upgrading of systems and equipment, was evident and was commendable.

III.E.2 **Performance Rating**: Category 1.

III.E.3 **Board Recommendation:**

None.

III.F. **Engineering and Technical Support** (639 hours 11.8%)

III.F.1. **Analysis**

In the prior assessment period, the Engineering and Technical Support area was rated Category 1. Positive factors were noted by the board in the following areas: engineering activities related to the design modification process, safety evaluation quality, and root cause analysis.

During this assessment period, engineering and technical support was generally good. The corporate staff provided ongoing support to resolve technical issues in support of plant operations and during outages. Technical evaluations in support of operability determinations were timely and generally reflected a conservative safety perspective.

Engineering activities associated with Yankee Rowe's reactor vessel radiation embrittlement presented a significant challenge to the licensee and required extensive interaction with the NRC staff. Early in the assessment period, the licensee was slow to address the uncertainties in their analysis and that the analysis did not support long-term operation of the reactor vessel. Additionally, they were slow to develop a test and material sampling plan to address the embrittlement issue. Later in the assessment period, significant management attention was focused on this problem and the licensee presented an aggressive plan to obtain the necessary data related to the resolution of this issue.

The design modification process was implemented through the Engineering Design Change Request (EDCR) procedure. This process was effective in producing high quality plant modifications. The technical basis for modification development was noted to be sound. Calculations used for design and safety evaluation bases were detailed and properly documented in accordance with engineering instructions and procedures. Licensee procedures for closeout of modifications were clearly stated and explicit. Training, procedure updates, control drawing revisions, and pre-operational testing were completed and documented prior to declaring the modified system operable.

An example of a quality modification was EDCR 90-301, entitled "Safety Injection Tank Replacement." The tank was designed by Yankee Project Department including mechanical, systems, and instrumentation and control engineering. The design procedure was developed in accordance with the YAEC Quality Assurance and Engineering Manuals including procedures for performing calculations by engineers, line-by-line calculation checks and calculation approvals by the task group. Yankee Atomic reviewed the final design for adequacy and acceptability before tank erection. During implementation of this modification the task force, including the site cognizant engineer and the construction department, met weekly at the Bolton office to review the status of the project and to resolve any problems regarding the modification.

During replacement and qualification testing of the emergency diesel generators (EDG) the quality of the engineering input provided by the Yankee Nuclear Services Division (YNSD) evidenced good engineering practices. The modifications were completed as planned and with sufficient design documentation. The engineering staff involved in the EDG replacement

modification was knowledgeable and cognizant of industry standards and regulatory requirements. Quality assurance was involved in the modification process as evidenced by their independent reviews, follow-up audits, and inspections of this modification. The technical support staff was knowledgeable in the design, installation and quality requirements. The level and quality of the engineering effort indicated substantial management involvement. However, the licensee's testing program for the modification was weak. For example, capacity margin was reduced from the EDG qualification test at a unity power factor, the preoperational test did not have an acceptance criterion for the frequency, and the reliability test results did not identify the unacceptable frequency drift.

Several factors contributed to the quality of the design modification process and their related activities. YNSD, the offsite engineering group for Yankee Rowe, continued to be staffed with motivated and highly qualified engineering personnel, capable of producing significant engineering modifications with limited reliance on consultants. In addition, a formal continuing plant system training program was established in the engineering division. This training was supplemented by industry sponsored seminars and conferences on technical issues affecting the plant. In addition to their technical expertise, the engineers were aware of and implemented industry guidelines for design and procedure changes in nuclear power plants and the guidelines for 10CFR 50.59 safety evaluations issued by the Nuclear Safety Analysis Center (NSAC 125). Management actively supported participation in industry related groups and societies to keep the company abreast of the latest information.

YNSD effectively used the limited engineering resources to address plant safety issues. Because of thorough planning and strong communications, challenges at the facility were resolved quickly and corrective actions implemented within establish schedules.

Generally, the engineering management was effective in recognizing safety significant plant deficiencies and implementing adequate corrective action. One exception was the licensee's inadequate corrective action to three nonconformances on pipe supports. An NRC finding of a missing support and subsequent NRC inspections revealed an incomplete response to NRC Bulletin 79-14. The licensee conducted further reviews and the deficiencies observed were not promptly documented as nonconformances prior to NRC attention. Another exception was, the lack of engineering assessment of the quality and rating of electrical fuses. Although a full physical inspection of the fuses in the plant was conducted in the 1990 refueling outage, no assessments on the acceptability on the existing fuses were made by the licensee until the end of the SALP period.

The licensee's onsite engineering is generally good in providing support for corrective maintenance. However, deficiencies were noted in the lack of engineering evaluation in support of operability determinations for emergency diesel generator overhauls and the safe shutdown system orifice replacement. Additionally, a drawing deficiency resulted in an isolation of station control air and resulted in a reactor trip on low steam generator level. Management redirected attention to ensure these specific issues were adequately resolved.

The licensee's corrective actions were generally effective in characterizing issues and establishing the root causes. The licensee's approach was technically sound with resolution completed in a timely manner. However, the licensee recently demonstrated untimely reaction

to indicators of a decrease in the design margins for important equipment. For example, management action did not effectively address the marginal capacity of the emergency diesel generators until an operability problem developed. Additionally, the incore detector system continued to degrade without significant action prior to the number of operable paths becoming a limiting condition.

During the refueling outage, reactor engineering and maintenance support engineering staffing levels were limited. This was demonstrated by the excessive overtime required to accomplish the scheduled tasks.

In summary, the licensee's engineering department continued to provide good support to the plant. Management involvement in implementing design changes and plant modifications was good. The onsite maintenance support department (MSD) and the YNSD engineering exhibited highly motivated, highly qualified personnel and stable work force. However, some weaknesses were noted in inadequate engineering evaluation for deficient plant conditions and corrective action. Initial engineering judgement for evaluations associated with reactor vessel integrity were not well supported.

III.F.2. **Performance Rating**: Category 2.

III.F.3. **Board Recommendation**

The one recommendation pertaining to this functional area is contained in Section III.G.3.

III.G. **Safety Assessment/Quality Verification** (596 hours, 11.1%)

III.G.1. **Analysis**

In the previous SALP, Safety Assessment/Quality Verification was rated Category 1. Strengths identified included self-assessment capability and quality assurance program implementation, and capability of identifying and effectively correcting deficiencies. However, continued attention in the radiological controls area was recommended.

During this current SALP period, no emergency technical specification changes were requested. This reflected good planning and scheduling by licensee management. License amendments, responses to NRC Bulletins and generic letters were of high quality and were comprehensive such that no requests for additional information were required. The licensee's submittals for changes in the technical specifications were of very high quality.

The licensee continued with upgrading and replacement of safety related equipment. Management attention was evident in detecting and assessing the reliability of the aging equipment. For example, a leak in the safety injection (SI) tank leak was regularly reviewed by plant management and appropriate thresholds were established for ensuring the safety of the plant. Upgrading of the excore nuclear instrumentation with an up-to-date control system was a significant safety enhancement.

The Plant Operations Review Committee (PORC) was effective in addressing nuclear safety issues. PORC involvement was particularly noteworthy in the prompt evaluation of the leaking safety injection tank and subsequent replacement. Similarly, a high level of oversight was evident in licensee response to the two control rods which did not fully insert at the end of cycle, to the leaking incore detector conoseal spire, and to the uncoupled control rod during startup after refueling. The PORC made effective use of subcommittees to address these issues.

The licensee Nuclear Safety Audit Review Committee (NSARC) provided independent offsite review. The NSARC appropriately discharged its duties in accordance with the requirements of TS. The NSARC was actively involved in the evaluations regarding questions of reactor vessel integrity and EDG capacity. However, during the initial phases, the licensee conclusions on the reactor vessel integrity and test program did not demonstrate adequate technical rationale.

Licensee corrective actions were generally effective in characterizing issues and establishing the root causes. The licensee's approach was technically sound with resolution completed in a timely manner. However, the licensee recently demonstrated untimely reaction to indicators of a decrease in the design margins for important equipment. Specifically, management action did not effectively address the marginal capacity of the emergency diesel generators until an operability problem developed. In another case, power cables to the emergency buses were stressed to the overload conditions during emergency diesel generator testing. Additionally, the incore detector system continued to degrade without significant action prior to the number of operable paths becoming a limiting condition.

The quality assurance department conducted 23 audits at Yankee Rowe in the current SALP period. These audit teams were composed of personnel from four other nuclear utilities and the licensee's corporate office. This intermix of auditors provided in-depth expertise and a fresh perspective in the licensee audits which resulted in findings of superior quality.

The quality control organization maintained a stable staff with a variety of in-depth technical skills. The licensee appropriately augmented the quality organization with personnel from another facility to evaluate the installation and testing of the new excore instrumentation system. The licensee's staff regularly conducted training for inspectors in specialized areas. The licensee's staff identified several quality concerns in nondestructive examination (NDE) of the new SI tank and associated piping installation. Licensee in-house capabilities were utilized in inspecting motor operated valve refurbishment, dedication process of the EDGs and liquid penetrant weld inspections during the extended outage. The development of in-house skills contributed to consistent improvement in quality of the work.

In addition to the Technical Specifications required review committees, the licensee chartered special teams and subcommittees with specific technical skills, for reviewing significant events. This technique was also utilized by the Plant Operations Review Committee (PORC) for evaluating modifications and resolving operational concerns.

Most safety evaluations for facility changes, tests and experiments made in accordance with 10 CFR 50.59 by YAEC were thorough and of good quality. Activities in this area were regularly reviewed by the Quality Assurance Department. The licensee continued a strong Quality Assurance program implemented by a very good quality assurance staff in areas such as license amendments, plant audits, facility changes in accordance with 10 CFR 50.59 and assessing the reliability of aging equipment. However, quality assurance in the area of post modification/maintenance testing was weak. The containment recirculation fan and the emergency diesel generators' deficiencies were not identified prior to release for operability due to inadequate testing. A further example was noted in the safe shutdown system, where subsequent to a modification, the post modification testing was not performed before declaring the system to be operable.

The licensee used a classification system of levels of importance for deficiencies. This allowed senior management to focus on the more important issues. Deficiencies were actively tracked with regular status review by senior management.

During the assessment period, the NRC had several meetings with the licensee regarding license renewal activities and initiatives and observed one of the licensee's plant walkdown inspections. In all instances, the licensee was well prepared and the presentations focused on significant issues, such as the process of identifying structures, systems, and components important to license renewal.

In summary, the licensee continued to implement a strong Quality Assurance program with a very good quality assurance staff in areas such as license amendments, plant audits, facility changes in accordance with 10 CFR 50.59, and assessing the reliability of aging equipment. Quality Assurance in the area of post-modification/maintenance testing was weak. An untimely reaction to indicators of a decrease in the design margins for important equipment was demonstrated by the electrical tie cables, the emergency diesel generators, and the incore detector system. Additionally, the licensee's initial evaluation of the reactor vessel integrity did not demonstrate a sufficient technical bases.

III.G.2. **Performance Rating**: Category 1, Declining.

III.G.3. **Board Recommendation**

The licensee should perform a comprehensive assessment of the adequacy of support provided to current plant activities such as the effectiveness of the post-modification/maintenance testing program to assure that resource allocations are appropriate such that the appropriate level of quality is being achieved. The results should be discussed with NRC management.

SUPPORTING DATA AND SUMMARIES

A. SALP Evaluation Criteria

Licensee performance was assessed in selected functional areas which were significant to nuclear safety or the environment.

The following evaluation criteria were considered, as applicable, to assess each function area:

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

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

3. Enforcement history.

4. Operational and construction events (including response to, analyses of, reporting of, and corrective actions for).

5. Staffing (including management).

6. Effectiveness of training and qualification programs.

On the basis of the NRC assessment, each functional area evaluated was rated according to three performance categories. These categories were:

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 Board may assess a functional area and compare the licensee's performance during an entire period in order to determine a performance trend. The trend definitions used by the SALP Board were as follows:

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.

It should be noted that Category 3 performance, the lowest category, represents acceptable, although minimally adequate, safety performance. If at any time the NRC concluded that the licensee was not achieving an adequate level of safety performance, it would then be incumbent upon NRC to take prompt appropriate action in the interest of public health and safety. Such matters would be dealt with independently from, and on a more urgent schedule than, the SALP process.

B. Background

Licensee Activities

At the beginning of the SALP period, the plant was operating at 100% power. On August 17, 1989, the plant was taken off-line to replace the main coolant system (MCS) loop No. 2 bypass line safety valve flange. On August 25, 1989, during plant heatup, an Unusual Event (UE) was declared and the heatup terminated when a MCS leak was identified on the loop No. 2 bypass line/vent line socket weld. During startup on August 29, 1990, a reactor trip occurred when the control room operator inadvertently turned the main steam non-return valve (NRV) Reset/Trip switch to the Trip position.

On October 25, 1989 the licensee initiated an emergency load reduction to repair a leak in the No. 1 feedwater heater drain line. During the load reduction, the No. 2 turbine control valve did not properly sequence closed. The control valve fast-closed resulting in an approximate 50 Mwe power transient. Control room operators effectively stabilized the plant and averted a reactor trip.

On March 8, 1990 during surveillance testing, power was lost to the No. 1 Emergency Bus when a bus tie breaker unexpectedly tripped following manual trip of a high pressure safety injection pump at the conclusion of testing. Emergency diesel generator No. 1 automatically started but the breaker did not close to energize the emergency bus. The control room operators restored electrical loads in a timely manner.

The plant maintained continuous power operation from August 30, 1989 until the core XXI refueling outage commenced on June 23, 1990. On April 24, 1990, the operator inadvertently tripped the emergency bus 2 while attempting to energize a safety bus from offsite source. This resulted in the automatic starting of the emergency diesel generator.

On June 24, 1990, two control rods failed to fully insert into the core during control rod drop testing. The projected seven week outage was extended into September to facilitate replacement of the three station emergency diesel generators. The licensee replaced the excore nuclear instrumentation system during the outage. The licensee completed construction of a new stainless steel safety injection tank to replace the leaking aluminum tank.

On September 25, 1990, the licensee conducted the annual emergency preparedness exercise. The Commonwealth of Massachusetts and the State of Vermont participated in the exercise.

On September 28, 1990, an Unusual Event was declared due to pressure boundary leakage at an incore detector conoseal connection. At the time, the plant was in Mode 3 (Hot Standby). The heatup was terminated and the plant returned to Mode 5 (Cold Shutdown) to effect repairs. During plant heatup on October 15, 1990, an Unusual Event was declared due to pressure boundary leakage at the same incore detector conoseal connection. The plant was returned to Mode 5 for repairs.

On November 1, 1990, the licensee terminated a plant startup from refueling when it was determined that the No. 24 control rod was uncoupled from its drive shaft.

On November 8, 1990, the primary reactor operator manually scrammed the reactor when several spurious indications of a reactor trip occurred during control rod tests prior to zero power physics testing.

Load reductions were performed at four different occasions to conduct repairs and cleaning on the main condenser.

On December 5, 1990 the reactor tripped due to steam generator low level. This was the result of isolating a plant air line without adequate technical review of the equipment interfaces.

On December 12, 1990 the licensee brought the reactor to Mode 2 to effect repairs on leaking steam generator No. 1 level instrument tubing.

NRC Review and Inspection Activities

In addition to the routine program inspections by resident and region based inspectors, the following special inspections and meetings were conducted during this SALP period.

During the period of November 6-14, 1989, a team inspection was conducted to examine the Emergency Operating Procedures (EOP) and training.

On July 9-20 and August 6-10, 1990, a Maintenance Team Inspection (MTI) was conducted by NRC Region I.

On August 24 - 28, 1990, an inspection was conducted on the YNPS emergency preparedness program and annual exercise. Also, during that week, four NRC Region I specialists conducted an inspection of the EDG replacement.

C. **Reactor Trips/Unplanned Shutdowns**

	Date	Power Level	Root Cause	Functional Area
1.	8/29/89	1%	Personnel Error	Operations

Description: Automatic Reactor Trip when the main steam non-return valve reset/trip switch was inadvertently turned to the trip position during plant heatup. This resulted, in part, due to a known problem in the man-machine interface of the control switch and due to a deficient procedure.

2.	11/8/90	0%	Random Equipment Actuation	N/A

Description: Manual Scram during control rod tests when several indications of a reactor trip demand occurred with no rod movement.

3.	12/5/90	100%	Deficient Drawing	Engineering/Technical Support

Description: Automatic Reactor Scram due to steam generator low level. A deficient plant drawing led to the inadvertent isolation of a plant air line resulting in the loss of control air to the heater drain tank high level dump valve, bypassing the contents of the heater drain tank to the main condenser. This resulted in an automatic tripping of the boiler (main) feed pumps on low suction pressure. The loss of flow resulted in a low level condition in the steam generators.

D. **Management Conferences**

A series of meetings were held with NRC headquarters and Region I office to address the structural integrity of the reactor vessel and to the long term vessel inspection requirements.

On September 21, 1990, an enforcement conference was held in the NRC Region I office to discuss inadequacies in emergency diesel generator capacity and post-maintenance testing.

The license renewal program (Plant Life Extension-PLEX) was the subject of a series of conferences at various NRC offices during this SALP period.

E. **Licensee Event Reports**

E.1. **Quality**

The Licensee Event Reports (LERs) accurately described the major aspects of each event, including component or system failures that contributed to the event and the significant corrective actions taken or planned to prevent recurrence. The reports were thorough,

detailed, well written and easy to understand. The narrative sections typically incl
specific details of the event such as valve identification numbers, number of ope
redundant systems, the date of completion of repairs, etc., to provide a good
of the events. The root causes of the events were identified when known.
determinations were not completed, the licensee typically committed to pr
supplemental report, as appropriate. Additionally, similar occurrences
referenced as applicable.

E.2. Causal Analysis

Twenty-five LERs (including supplements) were submitted d riod. These
events were properly addressed and the corrective actions v o prevent
recurrence.

Twelve LERs were classified as caused by personnel s were mostly random
and were not indicative any programmatic deficien

Seven LERs were generated due to componen ailures were primarily the
result of long term age-related equipment d

SEE AMENDED PAGE

REGIONAL ADMINISTRATOR

detailed, well written and easy to understand. The narrative sections typically included specific details of the event such as valve identification numbers, number of operable redundant systems, the date of completion of repairs, etc., to provide a good understanding of the events. The root causes of the events were identified when known. If root cause determinations were not completed, the licensee typically committed to provide a supplemental report, as appropriate. Additionally, similar occurrences were properly referenced as applicable.

E.2. **Causal Analysis**

Twenty-five LERs (including supplements) were submitted during the SALP period. These events were properly addressed and the corrective actions were appropriate to prevent recurrence.

Twelve LERs were classified as caused by personnel error. The errors were mostly random and were not indicative any programmatic deficiencies.

Seven LERs were generated due to component failures.

ENCLOSURE 2

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 50-29

APR 05 1991

Yankee Atomic Electric Company
ATTN: Mr. Andrew C. Kadak
President and Chief Executive Officer
580 Main Street
Bolton, Massachusetts 01740-1398

Gentlemen:

Subject: Initial Systematic Assessment of Licensee Performance (SALP) Report for Yankee Nuclear Power Station for the Period August 1, 1989 to January 15, 1991 (50-29/89-99)

An NRC SALP Board conducted a review on February 26 and March 29, 1991 to evaluate the performance of activities associated with the Yankee Nuclear Power Station. The results of this assessment are documented in the enclosed SALP report, which covers the period August 1, 1989 to January 15, 1991. We plan to meet with you at 1:00 p.m. on May 6, 1991 at an open public meeting in your Operations Training Center. At the meeting, please be prepared to discuss the assessment and any plans you have to improve performance.

This SALP noted strong management involvement and good to superior safety performance. Consistent superior performance was noted in Emergency Preparedness and in Security and Safeguards. Radiological Controls improved to the superior performance level. Performance in Plant Operations, in Maintenance/Surveillance, and in Engineering and Technical Support were rated as good, a decline from their previous superior ratings. Associated factors included marginal adequacy in numbers of licensed reactor operators, increases in operator errors, abnormal operating procedure deficiencies, an increasing number of equipment problems, several examples of inadequate post-maintenance/modification testing, and untimely reaction to indicators of decreases in design margins for important equipment. These factors were also significant in our assessment indicating a declining trend in the Safety Assessment/Quality Verification area. That area, though rated as superior, appears to have significant potential for dropping to a lower rating.

Your written comments, if needed, are requested within 7 days following the meeting. The enclosed report, your response, and a summary of our findings and planned actions will be placed in the Public Document Room.

Your cooperation with us is appreciated.

Sincerely,

Thomas T. Martin
Regional Administrator

Enclosure: NRC SAI P Report 50-29/89-99

cc w/encl:
J. Thayer, Vice President and Manager of Operations
N. St. Laurent, Plant Superintendent
G. Papanic, Jr., Senior Project Engineer - Licensing
R. Hallisey, Department of Public Health, Commonwealth of Massachusetts
L. McCarren, Commissioner, Vermont Department of Public Services
Chairman Carr
Commissioner Rogers
Commissioner Curtiss
Commissioner Remick
K. Abraham, PAO, RI (24 copies)
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
Institute of Nuclear Power Operations (INPO)
NRC Resident Inspector
Commonwealth of Massachusetts, SLO Designee
State of Vermont, SLO Designee

YANKEE HEARING SERVICE LIST

Dr. Andrew C. Kadak
President and Chief Executive Officer
Yankee Atomic Electric Company
580 Main Street
Bolton, Massachusetts 01740-1398

Mr. Jay K. Thayer
Vice President and Manager of Operations
Yankee Atomic Electric Company
580 Main Street
Bolton, Massachusetts 01740-1398

Resident Inspector
Yankee Nuclear Power Station
U.S. Nuclear Regulatory Commission
Post Office Box 28
Monroe Bridge, Massachusetts 01350

Thomas Dignan, Esq.
Ropes and Gray
One International Place
Boston, Massachusetts 02110-2624

Mr. John L. Lovering, Acting Director
Director of Massachusetts Civil
Defense Agency
400 Worchester Road
P. O. Box 1496
Framingham, Massachusetts 01701
ATTN: James Muckerheide

Robert M. Hallisey, Director
Radiation Control Program
Massachusetts Dept. of Public Health
150 Tremont Street, 7th Floor
Boston, Massachusetts 02111

Ms. Jane M. Grant
Senior Engineer - License Renewal
Yankee Atomic Electric Company
580 Main Street
Bolton, Massachusetts 01740-1398

Mr. George Sterzinger
Commissioner
Vermont Dept. of Public Service
120 State Street, 3rd Floor
Montpelier, Vermont 05602

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Mr. N. N. St. Laurent
Plant Superintendent
Yankee Atomic Electric Company
Star Route
Rowe, Massachusetts 01367

ENCLOSURE 3

SALP MANAGEMENT MEETING ATTENDEES
PUBLIC MEETING

MAY 6, 1991

USNRC, REGION I

C. Hehl, Director, Division of Reactor Projects (DRP)
W. Hodge, Director, Division of Reactor Safety (DRS)
T. Koshy, Senior Resident Inspector, YNPS
M. Miller, Resident Inspector, YNPS
J. Rogge, Chief, Reactor Projects Section 3A, DRP
A. Veber, Secretary, YNPS

OFFICE OF NUCLEAR REACTOR REGULATION (NRR)

P. Sears, Project Manager, Project Directorate I-3
D. Wessman, Director, Project Directorate I-3

YANKEE ATOMIC ELECTRIC COMPANY (YAEC)

G. Babineau, Radiation Protection Manager
D. Calsyn, QA Supervisor
C. Clark, Director, Training
B. Darcy, I&C Supervisor
N. Fetherstein, Maintenance Support Representative
M. Hedges, Chemistry Manager
K. Heider, Reactor Engineering Manager
T. Henderson, Assistant Plant Superintendent
K. Jurentkuff, Plant Operations Manager
A. Kadak, President
J. Kay, Technical Services Manager
D. King, Maintenance Support Supervisor
G. Maret, Technical Director
G. McDonald, QA Manager
W. McGee, Public Affairs Director
R. Mellor, Project Manager
R. Mitchell, Maintenance Director
J. Palmieri, Security Manager
A. Parker, Simulator Supervisor
S. Schultz, Vice President, Engineering Sciences
A. Shepard, Director of QA
T. Smith, Maintenance and Technical Training Supervisor
J. Spitulink, Outage Supervisor
N. St. Laurent, Plant Superintendent
J. Thayer, Vice President, Manager of Operations
F. Williams, Operations Support Manager
D. White, Operations Manager
B. Wood, Administrative Manager

PUBLIC

J. Muckerheide, Massachusetts Civil Defense
E. Wilkinson, Reporter, WFCR-FM, National Public Radio