

ENCLOSURE 1
INITIAL SALP REPORT

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

**SYSTEMATIC ASSESSMENT OF LICENSEE
PERFORMANCE**

SALP REPORT 50-271/89-99

**VERMONT YANKEE NUCLEAR POWER
CORPORATION**

**VERMONT YANKEE NUCLEAR POWER
STATION**

**ASSESSMENT PERIOD: OCTOBER 1, 1989 -
MARCH 16, 1991**

BOARD MEETING: APRIL 30, 1991

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Attachment 1: SALP Evaluation Criteria

1. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated 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 intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful feedback to the licensee's management to improve the quality and safety of plant operations.

This report is the NRC assessment of licensee safety performance at Vermont Yankee Nuclear Power Station for the period of October 1, 1989 through March 16, 1991.

An NRC SALP Board, composed of the staff members listed below, met on April 30, 1991 to review the collection of performance observations and data and to assess the licensee's performance. This assessment was conducted in accordance with the guidelines in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." The SALP Evaluation Criteria utilized by the Board is contained in Attachment 1.

Chairman:

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

Members:

J. Durr, Chief, Engineering Branch, Division of Reactor Safety (DRS)

M. Knapp, Director, Division of Radiation Safety and Safeguards (DRSS)

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M. Fairtile, Project Manager, PD I-3, NRR

Other Attendees:

D. Kern, Reactor Engineer, DRP

W. Pasciak, Chief, Facilities Radiation Protection Section, DRSS

C. Amato, Emergency Preparedness Specialist, DRSS

D. Chawaga, Radiation Specialist, DRSS

R. Keimig, Chief, Safeguards Section, DRSS

S. Chaudhary, Senior Reactor Engineer, DRS

J. Kottan, Laboratory Specialist, DRSS

II. SUMMARY OF RESULTS

II.A. Overview

The SALP Board assessment noted continued superior performance in the functional areas of plant operations, maintenance and surveillance, engineering and technical support, emergency preparedness, and safety assessment and quality verification. No evidence of declining performance was observed. The ability of the licensee to provide this sustained high level of performance was attributed to the competence and dedication of the management and staff of Vermont Yankee.

In those areas where high levels of performance existed at the beginning of the assessment period, successful management involvement identified enhancements designed to further strengthen already good performance. Scheduling, planning, and oversight strengths in plant operations provided high quality day-to-day operations. However, the determination of an unsatisfactory Licensed Operator Requalification Program detracted from otherwise exemplary performance. The maintenance program was further strengthened by formalized and enhanced program documents. The development of a maintenance planning and control system is being aggressively pursued. This system, in conjunction with the on-going conduct of comprehensive procedure reviews, provided a technically sound and thorough approach to enhancing the surveillance program. Support by Vermont Yankee for emergency preparedness was effective in resolving issues and aiding off site agencies. The quality of engineering support was excellent, with the development and very successful implementation of the Emergency Response Facility Information System being a notable achievement. Safety assessment and quality verification effectiveness was enhanced through upgrading of the corrective action process; however, the SALP Board noted a concern regarding Vermont Yankee's ability to effectively resolve employee concerns through its existing Improvement Suggestion Program.

While good performance was noted in Security, effectiveness was improved due to increased management attention and support. Further program and equipment improvements have been identified, with implementation being closely monitored by plant and security management. Although the performance of Vermont Yankee in radiological controls was not significantly different this assessment period as compared to the previous period, more aggressive management involvement was noted late in the period. This involvement resulted in the development of a Radiological Enhancement Program as an integrated response to a number of program and performance weaknesses in this functional area.

II.B. Facility Performance Analysis Summary

<u>Functional Area</u>	<u>Rating Last Period*</u>	<u>Rating This Period**</u>	<u>Trend***</u>
Plant Operations	1	1	
Radiological Controls	2	2	
Maintenance/Surveillance	1	1	
Emergency Preparedness	1	1	
Security	2	2	
Engineering/Technical Support	1	1	
Safety Assessment/Quality Verification	1	1	

* July 1, 1988 through September 30, 1989

** October 1, 1989 through March 16, 1991

*** Trends are improving (+) or declining (-)

III. PERFORMANCE ANALYSIS

III.A. Plant Operations (1193 hours, 30%)

III.A.1 Analysis

Plant Operations was previously rated as Category 1. During the previous assessment period strong performance in plant operations was characterized by good management involvement and oversight, responsiveness to safety issues, and clear management support for operator training. Improvements in the Fire Protection Program and the procedural review process were noted.

Throughout this period, plant and corporate management were actively involved in daily operational activities. Plant managers routinely toured the control room and established effective two-way communications with control room operators. Plant management oversight was clearly visible during operational start-up activities. On several occasions plant management conservatively decided to delay the progress of the reactor start-up to troubleshoot and repair equipment problems. Plant management decisions reflected a well established conservative safety philosophy which ensured that nuclear safety, personnel safety, and high quality operational performance remained paramount. Management controls, judiciously exercised, created an operational environment which focused licensed operator's attention on their duties. Operations management oversight was evident through aggressive involvement in all aspects of the operational organization and was very effective in maintaining the high quality of day-to-day plant operations.

Licensed operators conducted licensed activities in a professional manner. In general, operators demonstrated an excellent understanding of system interrelations which contributed to their ability to expertly handle several plant transients. These transients included a loss of turbine building closed cooling water, reactor power increase due to a malfunction of the recirculation master flow controller, loss of advanced off-gas system control power, and four automatic reactor shutdowns. Operator error was not a cause of these reactor trips; however, lack of operator understanding of the turbine mechanical hydraulic control (MHC) system was a contributing cause to one of these trips. Self assessments of operator performance during transients were critical and thorough and helped lead to a complete understanding of plant equipment and operating crew performance. Conduct of plant evolutions from the control room was excellent and in general, operators exhibited a healthy questioning attitude.

The Operations Planning Coordinator (or Group during the refueling outage) was instrumental in coordinating maintenance schedules and prioritizing maintenance and surveillance activities. The Operations Planning Coordinator interfaced effectively with plant departments and provided a conduit for resolving interdepartmental problems. Scheduled and unplanned outage work lists, Limiting Condition for Operation (LCO) maintenance periods, and daily work prioritization were coordinated through the Operations Planning Coordinator.

Successful implementation of the Operations Planning Coordinator duties minimized administrative distractions of control room operators without compromising their level of awareness of plant activities.

Outage planning and management were extremely effective. The safe completion of the 1990 refueling outage two days behind schedule was noteworthy when considering the scope of work accomplished and the ambitious six week schedule. The outage organization demonstrated versatility and flexibility by effectively resolving complex personnel and equipment issues. Equipment innovations expedited outage activities associated with local power range monitor and control rod drive (CRD) removal and consequently reduced personnel exposure. Plant and operations managers emphasized safety over schedule and took steps to address changing conditions. During the outage, senior plant and corporate management conducted frequent plant tours and were appropriately involved in the resolution of problems. First line supervisors provided valuable feedback into outage related issues and exhibited effective decision-making responsibility.

Licensed operator staffing remained stable and the experience level of senior licensed operators remained high. The licensee maintained six shift crews. The role of the Shift Engineer (SE) during transient plant conditions was clarified as a result of concerns identified during the licensed operator requalification (LOR) examination administered late in the assessment period. During upset plant conditions, the redefined role of the SE more closely modeled the traditional role of a Shift Technical Advisor.

A weakness was noted in the conduct of valve line-up operations. Two emergency core cooling system (ECCS) valve line-up deviations were made prior to performing the required safety evaluation. Subsequent to identifying these deficiencies, plant management provided concise clarification of their expectations for performing valve line-up deviations and effectively addressed this safety concern. Component and equipment operability determinations made by control room operators were generally conservative and timely. Complex operability determinations were expeditiously referred to operations management for disposition. In response to NRC concerns about determinations of operability with a component danger tagged in a position that prevented its operation, the licensee proceduralized a requirement for declaring such equipment inoperable. Near the end of the assessment period, the licensee adopted a more conservative safety philosophy for dealing with certain off-normal plant conditions.

The performance and effectiveness of the operator training program was mixed. All applicants (3 Senior Reactor Operators-SROs and 4 Reactor Operators-ROs) passed initial examinations in November 1989 and March 1991, respectively. Further, the requalification examination and program review of November 1989 determined that the program was satisfactory with no programmatic issues. However, the requalification examination conducted in March 1991 revealed programmatic weaknesses associated with crew performance resulting in the licensee's requalification program being determined to be unsatisfactory. The crew failures were based on poor crew communications and interaction

with particular weaknesses noted in the area of duties and responsibilities under emergency conditions of the Shift Supervisor, Senior Control Room Operator, and Shift Engineer (shift technical advisor). The licensee implemented immediate corrective actions and the NRC staff conducted evaluations of three crews to assess the corrective actions. The corrective actions were found to be satisfactory.

In summary, all levels of management were actively involved in the effective conduct of plant operations. Scheduling, planning, and oversight were noted strengths of the operational organization and served to ensure continued high quality day-to-day operations. The role of the Operations Planning Coordinator was prominent, particularly during the refueling outage, and became a valuable management asset for coordinating interdepartmental activities and reducing the administrative burden on control room operators. The stability and operational experience of senior control room operators remained high. A weakness in the conduct of valve line-up changes was being effectively addressed. A more conservative safety philosophy for dealing with certain off-normal plant conditions was noted near the end of the assessment period. The results of an LOR examination late in the assessment period identified a programmatic weakness based on unsatisfactory crew coordination and communication. After completion of corrective actions, the NRC conducted operator evaluations and the crews' performance was satisfactory.

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

III.A.3 **Board Comments:**

Based upon the overall strengths exhibited by Vermont Yankee in this functional area, the Board concluded that the determination of an unsatisfactory Licensed Operator Requalification Program, although a concern, did not warrant a reduced performance rating.

III.B. **Radiological Controls** (547 hours, 14%)

III.B.1 **Analysis**

The previous SALP report rated this functional area as Category 2. The Radiation Protection (RP) organization was found to be well defined and adequately staffed. The radiological controls program generally improved and the transportation, chemistry and effluents program were strong. The licensee made significant As-Low-As-Reasonably-Achievable (ALARA) improvements in operations associated with reactor vessel head removal. The licensee's program for minimizing personnel exposures was determined to be noteworthy. However, additional management oversight to improve the effectiveness of corrective actions was warranted.

Radiological Controls

Licensee performance in radiological controls was not significantly different during this period than during the previous period. Worker radiation exposure totals were low and no significant safety issues were noted. However, management involvement in program activities and staffing continued to be areas where improvement was warranted.

Licensee management involvement in assuring quality was determined to be adequate. During the assessment period technically comprehensive independent audits were conducted. Licensee management adequately addressed audit findings. A Radiological Enhancement Program (REP) was initiated late in the assessment period in response to the audit findings. This continuing program included near and long-term goals for program improvement and was considered a good initiative. However, at times during the current period, licensee management failed to adequately respond to other program deficiencies. For example, receipt of radioactive material was procedurally deficient yet no corrective actions were implemented prior to NRC identification. Early in the assessment period, the licensee implemented a procedure for storage of items in the spent fuel pool. The procedure was considered a good initiative, however, the procedure was not followed. Although RP management was aware of the procedural noncompliance, no effective corrective actions were taken for over five months. In addition, the licensee initially provided an inadequate written response to an NRC finding regarding incorrect technical interpretation of bioassay results. While the licensee made some improvements in the effectiveness of corrective actions, further improvements could be made in this area.

Staffing of the Vermont Yankee RP organization was determined to be adequate. Although the staffing level of permanent RP professionals and RP technicians remained relatively stable throughout the assessment period, the licensee had difficulty obtaining the desired number of contractor RP technicians with the desired level of experience to support the refueling outage. As a result of the shortage in RP technician support, the licensee had to compensate with the use of overtime and work in the turbine area had to be rescheduled. The licensee augmented its RP organization with some contractor RP technicians who had little or no commercial nuclear power experience. During the early portion of the refueling outage, the licensee observed that the lack of RP technician staffing and experience contributed to numerous occurrences of poor radiological work practices. The licensee has yet to finalize long term corrective actions for staffing weaknesses.

The licensee had a generally effective training program for both general employee radiation safety training and RP technician training. The general employee training properly focused on recent industry incidents and ensured that individuals working at the facility were properly trained.

The licensee's resolution of technical issues from a safety standpoint was determined to be generally sound and thorough. The licensee's Failed Fuel Action Plan resulted in an excellent review of the radiological consequences of the leaking fuel experienced during this

SALP interval. Conservative recommendations were prepared regarding termination of the operating cycle, should the levels continue to increase. However, during the early portion of the 1990 refueling outage, the licensee did not promptly address higher than normal levels of contamination in the turbine building by upgrading the RP coverage for turbine deck activities. This resulted in several personnel contamination incidents.

The licensee had an effective program for keeping personnel exposures low. The ALARA planning of both outage and non-outage work activities was considered excellent with a 1990 station cumulative exposure of approximately 290 person-rem. The licensee made aggressive efforts to complete the 1990 refueling outage expeditiously and with minimal personnel exposure. In addition, the licensee has an on-going program to use low cobalt bearing material for replacement components, which is a good source term minimization initiative. The licensee's maintenance of plant water chemistry contributed to keeping area dose rates low. During the last SALP period problems were noted in the area of locked high radiation area door control. Actions taken to preclude recurrence of these door incidents were effective.

Radiological Environmental Monitoring Program

Review of the licensee's Radiological Environmental Monitoring Program (REMP) indicated implementation of an effective program for routine operations. Collection and analysis of many sediment samples at the North Storm Drain Outfall, to follow up on identified plant-related radioactivity, was one indication of the commitment to conduct an effective program. An effective quality control (QC) program was in place to assure the quality of sample analysis. The meteorological monitoring systems were properly calibrated and maintained. Audits performed by the Quality Assurance (QA) Department were thorough and audit-identified recommendations were adequately resolved in a timely manner. In general, the licensee conducted an effective routine REMP.

In contrast, the licensee's evaluation regarding an acceptable Lower Limit of Detection (LLD) for incinerating waste oil originating inside the Radiologically Controlled Area was considered poor. The licensee did not have an adequate technical basis for the LLD used to release the waste oil. The licensee's actions in response to this issue appear to be appropriate.

Radiological Effluent Controls

The licensee conducted an effective routine radiological effluent control program. The licensee had an aggressive program of conserving water through using appropriate radwaste systems. As a result, planned radioactive liquid discharges have not been made since 1982. Effluent and process monitors were calibrated and maintained. Contaminated soil due to a chemistry laboratory drain line leak was handled properly by the licensee.

However, the licensee was not able to resolve a long-standing problem with the turbine building roof vent monitoring system during this assessment period. The licensee identified that the low level of contamination by Cs-137 and Co-60 in sediment samples collected at the North Storm Drain Outfall was due to ineffectively monitored releases through the turbine building roof vents. The licensee had some initial difficulty in addressing this issue. Late in the period, the licensee committed to take actions to resolve this item. However, resolution of this item was still pending at the end of the period.

Radwaste and Transportation

The licensee had a generally effective program for the packaging and transportation of radioactive materials, including solid radwaste. The licensee's program for the assurance of quality in the radwaste program was generally good. The surveillance conducted of the radwaste program was considered excellent. However, the annual audit of the program did not examine the current Process Control Program. The audit also did not address poor ALARA and contamination control practices associated with the loading of high integrity containers with dry resins. The initial and continuing training of the radiation protection staff involved in the area of radwaste was considered good.

Summary

Management involvement in assuring quality was determined to be adequate. A REP was initiated late in the assessment period. Staffing of the RP organization was determined to be adequate. However, staffing weaknesses occurred during the outage. The radiation safety training program for both general employees and RP technicians was good. Resolution of technical issues from a safety standpoint was determined to be good. The ALARA program was considered a licensee strength. The REMP and radiological effluent control programs were effective. The program for the packaging and transportation of radioactive materials was adequate.

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

III.B.3 **Board Comments:** None.

III.C. Maintenance and Surveillance (854 hours, 21%)

III.C.1 Analysis

The previous rating for the Maintenance and Surveillance area was Category 1 and was considered a licensee strength. The maintenance organization was comprised of experienced and highly dedicated personnel. Management routinely demonstrated a conservative safety approach to maintenance issues. The surveillance program was well implemented.

During this period, strong plant and corporate management involvement occurred routinely. In addition, a number of licensee initiatives occurred in this period. They reflected added licensee emphasis on the conduct of self-assessments; improved plant, process, and personnel efficiencies; and a reduction in substandard performance in safety-related equipment, maintenance programs, or contractors. Major initiatives included organizational realignment to place the operations and maintenance staffs under one superintendent; aggressive development of a maintenance planning and control system (MPAC); the development, by an inter-disciplinary task force, of an enhanced maintenance request procedure to provide clarity and substantial process control improvements; and implementation of an improved operating strategy which has as its cornerstone improved plant performance by optimizing the conduct of refueling outages.

The licensee continued to implement a comprehensive preventive and corrective maintenance program to help assure equipment operability. Equipment availability and performance generally remained high. This resulted from quality planning, proper prioritization, excellent control, and quality of workmanship and supervision by a skilled and dedicated staff. Improved planning and coordination have resulted in an up-to-date prioritization with supporting work packages and replacement parts. This facilitated effective use of short notice outages or power reductions and maximized maintenance activities. Corrective and preventive maintenance backlogs were well controlled. Good staffing levels supported routine operations, with augmentation by contractor and vendor experts to support special projects and outages.

The licensee was effective in resolving a number of environmental qualification (EQ) related issues identified in prior NRC inspections. However, another weakness involving implementation of their established EQ program was identified by the NRC. This resulted in a failure of the licensee's staff to properly identify and promptly correct degradation of the motor on the "A" spent fuel pool cooling pump. The licensee replaced the motor after an extended period of time.

The material condition and housekeeping in the plant were very good during power operations, and remained good in areas of maintenance activity. When housekeeping degraded during the outage, the licensee responded with aggressive corrective actions.

In contrast to the last assessment period, availability of plant equipment has improved. This was due to the controlled and technically competent manner in which equipment failures were addressed. Excellent reliability and availability of the uninterruptible power supplies (UPS) have been achieved. Improved performance of the toxic gas monitoring system (TGM) system has occurred. The licensee has experienced difficulties in rebuilding CRDs. A Commitment to Excellence Task Team has been assembled to identify improvements to address this issue.

The training and qualification program continued to be effective this period, as evidenced by few personnel errors and the low incidence of rework. Personnel error during maintenance activities contributed to one plant scram (LER 90-09).

Continued improvements in failure-mode analysis and root cause determinations were noted. The renewal and updating of vendor manuals was an NRC concern as noted in previous assessment periods. The licensee planned to review and update all the remaining safety class vendor manuals by the end of 1990. This did not occur as additional vendor manuals requiring updating were subsequently identified and resulted in the lack of timely resolution of this issue.

During this assessment period, the overall surveillance program continued to be well controlled and properly implemented. Surveillance procedures were, in general, technically accurate and provided sufficient instructions to help assure proper performance. Surveillance procedures were performed by highly experienced and knowledgeable personnel. The maintenance and surveillance training and qualification programs made a positive contribution to the understanding of work and adherence to procedures. Records were well maintained and testing was conducted within required frequencies. Strong inter-departmental communications and coordination routinely ensured that necessary plant conditions and prerequisites were established. A good level of management involvement was noted in the resolution of identified surveillance testing deficiencies.

No plant trips were caused by faulty surveillance activities but, nine LERs were issued in this period for events involving licensee surveillance activities. All events involved human factor deficiencies of personnel error or inadequate procedures.

The previous SALP noted a number of deficiencies in surveillance procedures which indicated that greater attention to detail in the implementation of the procedure development and revision process was appropriate. The licensee aggressively pursued this issue by providing a structured approach for accomplishing more comprehensive reviews during the biennial procedure review process. This corrective action was effective in identifying a long-standing missed surveillance involving reactor protection system instrument channel testing. Management attention appeared to be effective in improving procedure reviews through the use of a technically sound and thorough approach.

The inservice inspection (ISI) program was effective in ensuring operability of systems. The licensee also had an effective system for documenting and tracking ISI findings and for maintaining the status of the ten-year program. Code required and augmented examinations were performed by qualified technicians, and examination results were properly documented. Planning for refueling outage activities included information necessary to implement the inservice test program. A high quality inservice test (IST) program was implemented by the operations and maintenance departments. Program knowledge deficiencies involving the Shift Engineers were self-identified and remedial actions by the licensee were timely and appropriate.

Quality Assurance (QA) audits and reviews conducted by the on-site Quality Services Group have been effective in identifying improvements to surveillance activities and controls. A planned initiative to use the MPAC system as a replacement for the manually performed surveillance program scheduling should further strengthen this program.

In summary, The maintenance program remained a licensee strength. The surveillance program continued to be well implemented. Both programs reflected the involvement of experienced and highly dedicated personnel with active involvement by management. A number of positive initiatives occurred in the maintenance area to further strengthen this program. Isolated deficiencies involving inadequate implementation of the EQ program occurred. Actions to provide comprehensive reviews of procedures, and to assure surveillance requirements are accomplished were technically sound and thorough.

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

III.C.3 **Board Comments:** None.

III.D. **Emergency Preparedness (37 hours, 1%)**

III.D.1 **Analysis**

The previous SAIP report rated Emergency Preparedness as Category 1. This rating was based on continued improvement in the quality of procedures, facilities and training, good licensee performance during two exercises, and strong management support of the program.

Corporate and site management continued close involvement in emergency preparedness activities. The level of management involvement was demonstrated by the following: managers maintained Emergency Response Organization (ERO) position qualification; were required to review and approve emergency plan and implementing procedure changes; routinely provided active participation in drills and exercises; and provided frequent and effective interface with the States of Vermont and New Hampshire, the Commonwealth of Massachusetts, and town government personnel. Further, management required the emergency plan and implementing procedures to receive the same level of review and approval by the plant operating review committee as do other safety related procedures at the station. Finally, the emergency preparedness program was routinely monitored using standard management tracking and review techniques.

Emergency Preparedness (EP) staffing was stable and management expertise was maintained by the Emergency Preparedness Coordinator, a second level manager. He was provided sufficient support including a full-time staff member, two consultants, and the Yankee Nuclear Services Department. Operations input for scenario development was provided by SRO members of the Scenario Development Committee. The plant Radiation Protection Department maintained all Emergency Response Facilities in a state of readiness.

The 1990 partial-participation exercise was based on a severe accident scenario. The licensee's staff demonstrated that they could take timely and appropriate protective measures on behalf of public health and safety. Vermont, New Hampshire, the Commonwealth of Massachusetts, and the NRC participated in this partial-participation exercise. The licensee's interaction with and support of governmental participants was excellent.

Training has made a positive contribution to emergency preparedness effectiveness as shown by the exercise performance. Emergency Preparedness Training (EPT) was the responsibility of the licensee's Training Department with one technical trainer assigned to EPT and an EP-Training Department interface was established. A training matrix and lesson plans were developed. The licensee's Emergency Preparedness Coordinator reviewed and approved all lesson plans and examinations. In addition to classroom training, there were ten drills of various types. Almost all licensee staff members were qualified for an emergency response organization (ERO) position. At least three senior managers were qualified for each ERO management and decision making position. Positions are identified and their responsibilities defined. SROs were classroom and simulator trained in classification and protective action recommendation development. Effectiveness of operator training was demonstrated during the partial-participation exercise.

Strong management support of off-site emergency preparedness continued, as indicated by the following activities. Management was involved in off-site plan development and coordination. Almost weekly meetings were held with the States, the Commonwealth and town officials. Public Information Material was developed and distributed. Siren availability exceed US FEMA specifications. Tone Alert Radios were in wide spread use. The results of the NRC required annual audit by the licensee indicated the licensee/government interface was adequate.

No operational events took place during this SALP period that required classification. The licensee acted appropriately to resolve technical issues dealing with Emergency Action Level classification and Protective Action Recommendation development.

In summary, the licensee maintained an effective EP program throughout the assessment period. Management was involved and consistently demonstrated a commitment to quality. The emergency response organization was fully staffed. Training was effective as demonstrated by the partial-participation exercise response. The licensee maintained a good interface with officials of the States, Commonwealth, and towns.

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

III.D.3 **Board Comments:** None.

III.E. **Security** (290 hours, 7%)

III.E.1 **Analysis**

The previous SALP rated this area Category 2. Management involvement in certain program aspects was weak. Perimeter barrier and protected area exterior lighting were excellent, but the perimeter intrusion detection system and assessment aids suffered from failures to report problems and from delays in implementing repairs. The security training group was well-

supported and developed excellent programs. However, there was evidence that some security personnel were unfamiliar with security surveillance procedure requirements. The licensee's security program audit group failed to identify these problems. The problems were attributed to a compliance-oriented philosophy, rather than performance based, apparently shared by both plant and security management. The SALP Board recommended that the licensee assess the effectiveness of older security equipment and conduct a self-assessment.

In response to program weaknesses identified during the previous period, plant management increased its technical and financial support to upgrade the program. Technical support included (1) establishment of a security enhancement program committee, (2) prioritization of maintenance of security equipment, and (3) inclusion of the security supervisor at daily operations meeting to discuss activity impact on security. The prioritization of maintenance of security equipment was evidenced by a decline in compensatory measures. Financial support included (1) construction of a new gate house, (2) funding a study to improve assessment capabilities, (3) installation of new assessment equipment, (4) providing interface training for local law enforcement agencies, and (5) adding an armed security officer to the backshift to reduce the impact of collateral duties. However, progress on improving the assessment system was slow.

During the latter part of this period, security management began to establish better and more frequent communications with the NRC. As a result of the increased communications, it appeared that the licensee achieved a better understanding and appreciation of nuclear security program objectives. This was again indicative of increased management support for the program.

Security shift staffing was sufficient to meet routine program needs. However, in the latter part of this period, a substantial amount of overtime was incurred due to heightened security measures as a result of the Persian Gulf conflict. Some decline in morale resulted. However, only a few security events resulted from personnel error indicating that the decline in morale had not adversely affected security force performance. Security management showed marked improvements in overseeing the contracted security force. In one case, involving an inattentive security force member, licensee security management rejected the contractor's initial superficial assessment and mandated a more in-depth assessment. This demonstrated increased performance expectations from its contractor.

Security audits by the licensee's QA corporate staff were augmented by security professionals from other plants to provide more depth and a performance orientation. The audits were more comprehensive and generally thorough and audit deficiencies were acceptably corrected. However, the licensee failed to effectively audit its access authorization practices even though there were frequent access authorization program problems throughout the period. All nine events occurring during the period, which required prompt reporting to the NRC, were associated with access authorization. Of these, only six were promptly reported; three were mistakenly entered in the security event log, which is submitted to the NRC quarterly. Many of the access authorization problems resulted from the licensee's practice of relying on

Union Business Agents' certification as the basis for granting unescorted access to the plant. The licensee abandoned this practice late in the period and used its own investigative methods. Other events that occurred during the period were found to have been properly and adequately responded to by the licensee.

Security event logs generally were found consistent with NRC requirements. However, in most cases, the logs lacked the details necessary to fully reflect the effectiveness of program implementation. For example, when the log reflected the time a security system became degraded, it did not reflect the time of compensation for the degradation.

The licensee continued to administer its security training program with three professionals, a supervisor and two full-time instructors. The lesson plans accurately reflected the NRC-approved security plan and implementing procedures. The effectiveness of training was apparent in the case of a vehicle search during which a firearm and ammunition were found prior to entrance to the protected area, and in the relatively few personnel errors throughout the period.

The licensee implemented a Fitness-for-Duty (FFD) program in response to new NRC requirements. The FFD program and its implementation were found to be responsive to the spirit and intent of the NRC's FFD rule. The program was well implemented as indicated by no regulatory concerns being identified.

Summary

During this SALP period, security effectiveness improved due to security management's increased attention to the program and plant management's increased support. Progress was made in effecting improvements in several areas where weaknesses previously existed, such as plant and security interface, assessment capability, audits and communications with NRC. However, in some other areas, e.g., access authorization, NRC reporting requirements and documentation of events, aggressive action and a clear understanding of the potential problems were not as apparent. The training program remained very effective as evidenced by few personnel errors and plant and security management appeared more cognizant of program requirements and objectives. Additional program improvements have been initiated and others are scheduled.

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

III.E.3 **Board Comments:** None.

III.F. Engineering and Technical Support (591 hours, 15%)

III.F.1 Analysis

The previous SALP report rated performance in this area as Category 1, with an overall conclusion that the licensee continued to have a high quality engineering program. Weaknesses, however, were identified in the areas of Justification for Continued Operation (JCO) development, the program for temporary modifications, and the fire protection program.

In general, the quality of engineering activities and support provided by the onsite and offsite groups continued to be excellent during this assessment period. The following examples demonstrate good engineering support and safety initiatives, as well as technical expertise in resolving safety concerns: resolution of Generic Letter 89-16, "Installation of Hardened Wetwell Vents"; the upgrading of the LOCA analysis; reload analysis method; core stability; and upgrade to uninterruptible power supply (UPS) to LPCI injection valves. Further, no weaknesses were noted involving development of JCOs or the fire protection program during this assessment period.

In addition to the above, the licensee also initiated programmatic improvements in this area. These include: reorganization of the engineering department to enhance continuity and accountability; enhancement to the procurement process for commercial grade items; procedure enhancements and new procedure implementation; collection, storage, and retrieval of design basis information and documentation; and the development of a procedure to assure a structured approach for one-for-one component replacement evaluations.

The licensee's effective outage planning has contributed to significant dose reductions to workers. The aggressive actions to reduce the impact of fuel leaks, and subsequent actions to determine the cause of the leaks were also effective.

A procedure providing guidelines for high quality 50.59 evaluations has been implemented. This procedure is used when engineering evaluations are required even if no design change is involved. Procedures at YNSD (offsite engineering group) have also been revised to require that evaluations similar to 10 CFR 50.59 evaluation be performed for transients documented in the FSAR for all future design changes. The above procedure demonstrates the licensee's emphasis on design and operational safety. However, more time and data are needed to determine the effectiveness of this process.

Despite these current improvements in the 10 CFR 50.59 process, some problems with safety evaluations were identified. However, in analyzing the problem in a broader context, a recent problem of delayed safety evaluations appeared to be isolated, and the second problem was not indicative of the current safety evaluation process.

A related area of concern involved the surveillance testing of the Emergency Diesel Generators, and load studies for electrical loading of MCCs. The licensee's quick response was demonstrated by the immediate testing of EDGs and review of electrical load studies.

The Design Basis data initiative, although only partially completed, provided ready access to needed design information in response to an incident. This was evident in the rapid resolution to a concern regarding a Standby Liquid Control pump.

The licensee demonstrated appropriate management attention and a level of safety perspective that enhanced plant safety throughout the assessment period. Vermont Yankee has satisfactorily progressed toward completion of a PRA and has completed the "Initiating Events" and "Frontline Events" tree this SALP period. Also, Fault Tree models involving independent failure modes have been completed. During this SALP period, the licensee applied the PRA insights to address recurring problems with the Toxic Gas Monitoring System, and to evaluate and to request changes to the frequency of surveillance tests required by Technical Specifications for certain safety equipment.

During this SALP period, Vermont Yankee's Emergency Response Facility Information System (ERFIS) which includes the Safety Parameter Display System became operable. Although, one of the last plants to get the SPDS operable due to vendor delays, the system is state-of-the-art. ERFIS is a valuable aid to operations and engineering personnel in on-line trending and for transient analysis, and thus, contributes to enhanced plant safety. The engineering team responsible for this system did excellent work in developing design criteria. Also, Vermont Yankee's acquisition of the 3-dimensional mono core C-code from General Electric provides the capability to model reactor power distribution. This code can predict intended effects of control rod patterns and can be used in evaluating the reactor start-up process. The above improvement in engineering capability demonstrates the licensee's safety commitment.

The effectiveness of engineering training was evidenced by efficient planning and design of modifications and design changes that were completed during the 1990 outage with a minimum number of field changes and rework. Subsequent to the engineering organizational changes, the modification packages compiled by the licensee demonstrated the management emphasis on detailed documentation and technical rationale of modifications. The following items in the packages were noteworthy: (1) The scoping memoranda were comprehensive. They contained the engineering rationale for the change, an adequate description of the intended design change, and a preliminary project plan and schedule with anticipated benefits of the modification. (2) The safety evaluations performed under 10 CFR 50.59 for the planned modification were detailed, and technically very good. (3) The review of the preliminary scoping memoranda and project plan by other technical and management personnel within and outside the originating department were also comprehensive, and of excellent quality. (4) Well defined requirements and acceptance criteria for post modification tests were included in the project plans.

A concern regarding control of temporary modifications has been addressed by the licensee through implementation of a new procedure which requires that a temporary modification must be approved by PORC if it is to remain in effect for more than six months. This control is effectively exercised by a quarterly review of all temporary modifications in the plant.

In summary, the quality of engineering support provided by onsite and offsite engineering groups was excellent. Planning and engineering work for design changes and modifications, root cause analysis, and recommended corrective actions were also of high quality. The effectiveness of modification implementation was indicative of a competent, well trained staff. Communications were effective between various plant, corporate, and offsite organizations.

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

III.F.3 **Board Comments:** None.

III.G. **Safety Assessment and Quality Verification** (508 hours, 12%)

III.G.1 **Analysis**

The previous SALP rated this area Category 1; however, it was noted that the licensee experienced difficulty in maintaining an effective corrective action process.

During this period, the licensee continued to demonstrate a responsible safety attitude toward licensing issues. The licensee's safety evaluations accompanying license amendment requests were detailed and addressed the criteria needed to make a finding on significant hazards. An example was a request to recapture the construction period thus extending the term of the operating license. The licensee's submittal covered all the required environmental and safety information needed by the staff. This was a very complex amendment request involving safety related components, systems and structures, and the impact of the plant on the environment since it received its original operating license in 1977. Other significant licensing activities conducted during this period that enhanced plant safety, were the implementation of the SPDS and demonstration of licensee controls over Vernon Dam that helped resolve the station blackout review at the plant. In addition, the licensee was able to demonstrate conformance with rule 10 CFR 50.62 (Anticipated Transients Without Scram) through proposed plant modifications and submittals describing present reactor trip and alternate rod injection systems.

Licensee Event Reports (LERs) were well written and contained adequate descriptions of the event. Root cause analyses were technically correct and satisfactory corrective actions were recommended. Where broader or in-depth analysis was needed, problems were referred to YNSD. Onsite engineering personnel interacted well with the corporate and offsite engineering group.

Operational event reportability, conducted in accordance with 10 CFR 50.72, was also timely. In general, the reportability determinations reflected a very conservative understanding of 10 CFR 50.72 requirements. However, some lack of understanding of reportability requirements occurred and shift personnel did not fully benefit from on-shift reportability expertise. In response, plant management provided additional clarity in 10 CFR 50.72 reporting.

The licensee made many changes under the provisions of 10 CFR 50.59 during this period as reported in their 1990 Annual Operating Report. However, many were minor or of a temporary nature. Many others, made under the licensee's initiatives, enhanced safety at the plant. Examples of these are a seismic instrument upgrade, feedwater check valve replacements, improvements to annunciator panels in the control room, replacement of the UPS for ECCS valves and separation of post-accident monitoring system cables to enhance system reliability. A change involving a new fuel type and a new control rod design in the core was prudently discussed with the staff prior to implementation. The staff review of the 1990 Annual Operating Report concluded that the report was thorough and displayed an appropriate safety perspective.

Licensee initiatives generally continue to have a positive impact on the quality of plant operations. Several examples are: (1) The licensee continues to exchange technical specialists with other nuclear utilities to their mutual benefit and QA audits continue to be performance based; (2) The licensee has focused management attention in improving the corrective action program, and this weakness pointed out in the previous SALP report has been corrected; and (3) Active participation in the QA audit process.

As part of a self-improvement program the licensee has instituted a Commitment to Excellence Program (CEP). The CEP goal is to provide management oversight in a structured manner to areas and processes where improvements in quality are necessary. Personnel are encouraged to perform their work activities in a quality fashion. The effectiveness of the CEP is evidenced by a relatively low number of personnel error related events. These initiatives have resulted in quality job performance at all levels within the licensee organization.

The licensee has been effective in correcting substandard conditions or anomalous performance. Examples are roof repairs required because of leaks in the emergency diesel generator room, and the manner in which equipment deficiencies are resolved and measures taken to avoid recurrences. An exception to this good performance was the protracted effort to correct an equipment deficiency in the spent fuel pool cooling system.

The licensee has identified potential problem precursors in an effective manner and dealt with the problems employing a conservative safety perspective. Examples include: careful following of effects of failed fuel pins, monitoring of drywell temperatures and an accelerated inspection frequency established for the emergency diesel generators. Plant performance monitoring is conducted by the SEs in their assigned systems and formally reported on a monthly basis. This monitoring of major plant safety systems is an element in identifying potential problem precursors.

Licensee effectiveness in monitoring overall plant performance was improved through the establishment of the position of Operations Planning Coordinator as described in Section III. Overall plant performance is also reviewed by an effective PORC, which also provides oversight in plant recovery from outages. The new ERFIS has aided oversight by monitoring plant safety parameters on a continuous basis.

An example of the implementation of safety policies showing licensee concern for quality over production demands was exhibited in the licensee response to a plant trip and resolution of an MHC system problem involving the turbine. The licensee delayed restart until operators fully understood the system. In general, a strong orientation towards safety continues to be exhibited by the licensee.

The licensee has been effective in resolving safety issues. While the licensee has not been totally effective in resolving security issues as previously discussed, improvement has been noted. Management involvement and oversight in security contractor activities has improved. Improvement has been observed in the resolution of emergency planning issues.

In general, Vermont Yankee Safety Committee activities are effective in providing the proper oversight function. The PORC and the Nuclear Safety and Audit Review Committee provide effective safety oversight and ensure proper resolution of potential safety issues. Efforts to improve the documentation of meetings have been successful. Substantial improvement in PORC reviews of plant conditions, oversight of plant recovery from outages and, when required, Justifications for Continued Operation have occurred.

A QA weakness was identified regarding the licensee oversight of contractor work involving the fabrication of two safety relief valve accumulators without an approved procedure. This issue and several others highlight problems occurring this period involving employee concerns and the manner in which they are addressed. The increased activity in this area suggests that a weakness may exist in the employee concerns program. The licensee has responded to these issues with changes to the employee "Improvement Suggestion Program;" however, the effectiveness of this action remains to be demonstrated.

In summary, the licensee improved an already strong area in licensing and in resolving technical issues. Submittals were timely, responsive to safety issues and of a high technical quality. Quality verification programs also were a strong area but have again improved since the previous period, especially in the area of corrective action programs. Strong management involvement continues to be noted.

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

III.G.3 **Board Comments:**

The licensee should evaluate the effectiveness of their program for dealing with employee concerns.

ATTACHMENT 1

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 S/LP process.