

INITIAL SALP REPORT

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

50-382/89-36

Louisiana Power & Light Company
Waterford Steam Electric Station, Unit 3

August 1, 1988, through October 31, 1989

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance on the basis of this information. The program is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. It 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 regarding the NRC's assessment of their facility's performance in each functional area.

An NRC SALP Board, composed of the staff members listed below, met on December 7, 1989, to review the observations and data on performance, and to assess licensee performance in accordance with Chapter NRC-0516, "Systematic Assessment of Licensee Performance." The guidance and evaluation criteria are summarized in Section III of this report. The Board's findings and recommendations were forwarded to the NRC Region IV Regional Administrator for approval and issuance.

This report is the NRC's assessment of the licensee's safety performance at Waterford Steam Electric Station, Unit 3 (Waterford 3) for the period August 1, 1988, through October 31, 1989.

The SALP Board for Waterford 3 was composed of:

- S. J. Collins, Director, Division of Reactor Projects, Region IV
- L. J. Callan, Director, Division of Reactor Safety, Region IV
- F. J. Hebdon, Director, Project Directorate IV, Office of Nuclear Reactor Regulation (NRR)
- T. P. Gwynn, Deputy Director, Division of Reactor Projects, Region IV
- D. D. Chamberlain, Chief, Project Section A, Division of Reactor Projects, Region IV
- B. Murray, Chief, Facilities Radiological Protection Section, Region IV
- W. F. Smith, Senior Resident Inspector, Region IV
- D. L. Wigginton, Senior Project Manager, Project Directorate IV, NRR

The following personnel also participated in the SALP Board meeting:

- J. W. Roe, Director, Division of Licensee Performance and Quality Evaluation, NRR

A. T. Howell, Project Engineer, Region IV

S. D. Butler, Resident Inspector, Region IV

P. J. Prescott, Reactor Engineer, Performance and Quality Evaluation Branch, NRR

J. M. Sharkey, Regional Coordinator, Office of the Executive Director for Operations.

II. SUMMARY OF RESULTS

A. Overview

During this SALP period, performance improvement was noted in most areas. Continued strong performance in the emergency preparedness and security areas was reflected by the Category 1 ratings in those areas. Performance in the area of plant operations improved to a Category 1 rating and reflected effective management involvement and a well trained, professional operations staff. Continued strong performance in this area depends on the procedure upgrade program and continued emphasis by management on high quality individual performance. The Performance in the maintenance/surveillance area was a Category 2 with an improving trend identified. Performance in the engineering/technical support area was a Category 2 with some improvement noted from the previous SALP period. Continued improvement in this area is dependent in part on licensee efforts to increase engineer plant knowledge level and efforts to improve the quality of engineering evaluations. The Category 2 rating in the radiological controls area reflected steady performance on day-to-day activities and, while some improvement from the previous SALP period was noted, performance did not substantially exceed regulatory requirements. Common themes reflected in the safety assessment/quality verification area were believed to affect all functional areas in terms of continued high-level performance or continued improvement. Further improvement is possible provided that management continues to emphasize the common themes of good procedures, self-critical approach to issues, expanded corrective actions, and improved communications with NRC.

<u>Functional Area</u>	<u>Previous Performance Category (02/01/87 to 07/31/88)</u>	<u>Present Performance Category (08/01/88 to 10/31/89)</u>
1. Plant Operations	2	1
2. Radiological Controls	2	2
3. Maintenance/ Surveillance	2	2 (improving)

4.	Emergency Preparedness	1	1
5.	Security	1	1
6.	Engineering/ Technical Support	2	2
7.	Safety Assessment/ Quality Verification	2	2

III. CRITERIA

Licensee performance was assessed in seven selected functional areas. Functional areas normally represent areas significant to nuclear safety and the environment.

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

- A. Assurance of quality, including management involvement and control;
- B. Approach to the resolution of technical issues from a safety standpoint;
- C. Responsiveness to NRC initiatives;
- D. Enforcement history;
- E. Operational events (including response to, analyses of, reporting of, and corrective actions for);
- F. Staffing (including management); and
- G. Effectiveness of training and qualification program.

However, the NRC is not limited to these criteria and others may have been used where appropriate.

On the basis of the NRC assessment, each functional area evaluated is rated according to three performance categories. The definitions of these performance categories are as follows:

Category 1 - Licensee management attention and involvement are readily evident and place emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Licensee resources are ample and effectively used so that a high level of plant and personnel performance is being achieved. Reduced NRC attention may be appropriate.

Category 2 - Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities is good. The licensee has attained a level of performance above that needed to meet regulatory requirements. Licensee resources are adequate and reasonably allocated so that good plant and personnel performance is being achieved. NRC attention may be maintained at normal levels.

Category 3 - Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are not sufficient. The licensee's performance does not significantly exceed that needed to meet minimal regulatory requirements. Licensee resources appear to be strained or not effectively used. NRC attention should be increased above normal levels.

The SALP is not intended to be a substitute for NRC's enforcement policy. Enforcement action does not await the outcome of a SALP, but is taken at the time the unacceptable action(s) or event(s) occur(s). In this regard, the SALP process can assist NRC management by providing perspective, but it is not a substitute for effective enforcement action. Where licensees are incapable of meeting regulatory requirements, the affected plants will be shutdown.

This SALP report includes an appraisal of performance trends in certain functional areas. Determination of the performance trend was made selectively and was reserved for those instances when it is necessary to focus NRC and licensee attention on an area with a declining performance trend, or to acknowledge an improving trend in licensee performance.

The trend, if used, is defined as:

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

IV. PERFORMANCE ANALYSIS

A. Plant Operations

1. Analysis

The assessment of this functional area consisted chiefly of the control and execution of activities directly related to operating the plant. It was intended to include activities such as plant startup, power operation, plant shutdown, and system lineups. Thus, it included activities such as monitoring and logging plant conditions, normal operations, response to transient and off-normal conditions, manipulating the reactor and auxiliary controls, plantwide housekeeping, control room

professionalism, and interface with activities that support operations.

This area was inspected on a continuous basis by resident and region based inspectors. The performance of in-plant operations has steadily improved since the beginning of the SALP period.

The plant operated at high availability throughout the SALP period with few operational events and forced outages. In response to most events, operations personnel performed in a highly professional and competent manner. For example, on July 15, 1989, the operators manually tripped the reactor in anticipation of a protection system challenge to trip the reactor automatically on low steam generator water level caused by a feedwater regulating valve failing shut. This action and those that followed were appropriate and timely. However, one complex operational event occurred at the end of the SALP period which indicated a need for improvements in oversight and management support of operations. On August 19, 1989, a reactor trip occurred because of a high negative axial shape index which resulted during a rapid down power transient that was required by Technical Specifications (TS) because of an immovable control element assembly. In this particular event, operational errors and procedural weaknesses contributed to the trip. The licensee recognized this and was very thorough in reviewing the event and identifying causes and corrective actions.

The licensee's programs to reduce challenges to engineered safeguards and reactor protection systems were effective throughout this SALP period. There was a significant reduction in such challenges as compared to the previous SALP period. The licensee implemented a "safe work" program in early 1989 to minimize inadvertent engineered safety feature actuations and reactor trips, through increased awareness by maintenance and operations personnel of the risks inherent in certain maintenance tasks. The program identified high risk areas to work planners and plant operators so that extra precautions could be taken. In addition, the licensee strengthened the post-trip review process to ensure that appropriate corrective action would be taken to minimize the recurrence of errors.

Operator performance and professionalism steadily improved during this SALP period. Licensee management implemented corrective actions in response to NRC concerns regarding procedure compliance as indicated in several inspection reports issued during the last SALP period and in the previous SALP report. In addition to individual counseling and disciplinary action when appropriate, the licensee established an "Improving Human Performance" program. The program involved training seminars for nuclear operators, managers and supervisors, management observation and reporting of activities, and

directives from management, which made it clear that procedure noncompliance was not acceptable at Waterford 3. Improved procedural compliance was evident through a reduced number of procedure violations and an increase in the number of requested procedure changes. To reinforce this trend, the licensee completed "one-on-one" interviews between all operations personnel and their managers to ensure that each employee personally acknowledges and understands what is expected with regard to procedure compliance. This initiative was also being applied to all remaining station personnel, and was scheduled for completion by the end of 1989.

In early 1989, the licensee implemented new procedure writing guidelines, followed by implementation of a procedure upgrade program to improve the technical adequacy and human factor aspects of operations procedures. The procedure upgrade program was implemented in response to both licensee and NRC concerns that procedure inadequacies were continually being identified and to support procedure compliance through improved guidance and technical detail in procedures. By the end of the SALP period, 149 of 260 operations procedures had been upgraded and approved. The operations procedure upgrade program is scheduled to be completed by July 1990.

Although there was improvement noted in procedure compliance by the operations department, there were violations identified during this assessment period involving noncompliance with procedures. This included three examples involving the operation of danger-tagged valves.

In addition, lift setpoint testing of the main steam code safety valves in September 1989 revealed a weakness in management guidance for dealing with questionable surveillance test data and resulted in operation at a power level that was higher than permitted by the TS. These issues were discussed at an enforcement conference on October 24, 1989. The licensee was responsive to NRC concerns at this conference, and management expectations are being provided to licensee personnel in both areas.

As a result of difficulties experienced with shutdown cooling during reduced reactor coolant system (RCS) inventory (partially drained to mid-loop) operations that occurred in the previous SALP period, the licensee implemented extensive corrective actions. The implementation of these corrective actions throughout the third refueling outage resulted in properly functioning RCS level indicating equipment and a high level of operator awareness in maintaining RCS inventory and shutdown cooling capability.

The annunciator reduction program has received management attention and made considerable progress during this SALP period toward the goal of achieving a "black board" by the end of the third refueling outage. This goal was not achieved because a modification to a secondary system did not produce the desired results on three annunciators and an instrument cabinet temperature alarm is still under study.

Housekeeping at Waterford 3 has been excellent throughout the SALP period. The licensee assigned area coordinators to specific areas to identify deficiencies and initiate corrective action. The licensee stated that during this SALP period, over 1552 deficiencies were identified and 1270 corrected through use of a "Plant Improvement List." There has also been a continuing effort to maintain the quality of painted surfaces, particularly in high traffic areas.

Operator retention and morale appeared to be excellent. LP&L has a degree program for licensed operators, enabling them to enroll in an academic program and earn a Bachelor of Science Degree in Nuclear Science. The licensee stated that as of the end of the SALP period, 109 personnel were enrolled in this program.

The licensed operator requalification program was determined to be satisfactory based on an evaluation performed in September 1989. Initial problems were noted in the development of the examination material; however, this has been a common occurrence during the first requalification program evaluation using the new requirements of NUREG-1021, "Operator License Examiner Standards." The licensee staff was responsive to NRC comments regarding requalification examination material.

Overall, licensee performance on operator licensing activities has been satisfactory. Earlier in the assessment period, performance on the October 1988 examinations was significantly below the last SALP period's results. Simulator fidelity concerns were brought to the licensee's attention as a result of these examinations, and the licensee was responsive in correcting the concerns. Performance on the May 1989 examinations showed a marked improvement. As of the end of this SALP period, Waterford had 42 senior operator licenses and 21 reactor operator licenses. This number of licenses exceeded the staffing needs for shift manning and rotation required by TS.

2. Performance Rating

The licensee is considered to be in Performance Category 1 in this area.

3. Recommendations

a. NRC Actions

NRC inspection effort should be consistent with the fundamental inspection program.

b. Licensee Actions

The licensee should consider the following actions to improve performance in this functional area:

- ° Licensee management should continue to encourage professionalism on the part of operations personnel;
- ° Licensee management should assure timely and high quality completion of the procedure upgrade program; and
- ° Licensee management should continue to be proactive in improving compliance with procedures.

B. Radiological Controls

1. Analysis

The assessment of this functional area consisted of activities directly related to radiological controls, including occupational radiation safety (e.g., occupational radiation protection, radioactive materials and contamination controls, radiation field control, radiological surveys and monitoring, and as low as is reasonably achievable programs), radioactive waste management (i.e., processing and onsite storage of gaseous, liquid and solid wastes), radiological effluent control and monitoring (including gaseous and liquid effluents, offsite dose calculations, radiological environmental monitoring, and confirmatory measurements), water chemistry controls, and transportation of radioactive materials (e.g., procurement of packages, preparation for shipment, selection and control of shippers, receipt/acceptance of shipments, periodic maintenance of packagings, and point-of-origin safeguards activities).

The radiation protection program was inspected twice by region-based radiation specialist inspectors in addition to the routine inspections performed by resident inspectors. One violation in this area involved skin exposures from hot particles. The licensee's corrective actions concerning the hot particle violation included improved radiological survey procedures and the identification and establishment and control of zones where hot particles are likely to be found. Two other violations were

attributed to a failure of auxiliary operators to follow procedures and are not indicative of any major program deficiencies.

Quality assurance involvement with radiation protection activities was evident by the performance of comprehensive audits in this area. Audit findings have resulted in program improvements and the quality of the licensee's audits indicate a good understanding of technical issues associated with radiation protection activities. The radiation protection staff's response to audit findings were usually submitted in a timely manner and their responses included proper technical resolutions. The licensee's analysis of the hot particle problems showed a good evaluation of the root causes and the implementation of sound technical corrective actions.

Staffing in the radiation protection area has been maintained at an adequate level to support plant operations with vacancies usually filled in a timely manner. Staff positions and responsibilities are well defined. Qualification criteria has been established for the radiation protection staff. A defined training program has been implemented to ensure qualification criteria are satisfied. There appears to be a good working relationship between the radiation protection department and other departments, such as operations and maintenance and plant management supports the implementation of an aggressive radiation protection program.

A well defined ALARA program is in effect. The program includes the proper level of planning and review for scheduled work activities. The licensee has included as part of the ALARA program, the chemical decontamination of certain plant systems prior to maintenance work in order to reduce radiation levels. The ALARA program also includes the decontamination of localized hot spots found in piping in accessible plant areas. The accumulated person-rem values for this assessment period are higher than in the past; however, this is attributed to increased maintenance and outage activities and is not an indication of a declining ALARA program.

The radiation protection program implementing procedures are of good quality. The procedures contain enough information and guidance to accomplish the designated tasks. The licensee's audits identified a finding concerning the failure of certain procedures to receive proper review and approval. Licensee corrective actions were timely and appropriate.

The radioactive waste management program was inspected during the assessment period. Several modifications and design changes have been made to improve the gaseous waste system. The

licensee also identified eleven potentially unmonitored gaseous release points not described in the Updated Safety Analysis Report (USAR). The licensee conducted a technical evaluation of potential, past releases, and resolved the problem. The licensee demonstrated good safety evaluation initiatives as evidenced by the 10 CFR 50.59 and ALARA evaluations. The licensee has a well-defined liquid and gaseous release permit program. Effluent releases appear to meet ALARA objectives. Management oversight of radwaste activities was evident by the performance of comprehensive audits and surveillances. In the radioactive waste management area, no problems were noted in the areas of staffing, training, and procedures.

The radiological environmental monitoring program was inspected once during the assessment period. In general, the program is effective and well managed. Offsite sample stations are well maintained and operational. Environmental reports are well written and contain the required information. An adequate trained staff was in place to implement the environmental program. Management oversight was present in the form of comprehensive audits and the issuance of implementing procedures. One problem was noted in that the licensee was slow to correct several identified problems concerning missing data from the primary meteorological tower.

The radioactive material transportation program was inspected once during this assessment period. Two problems with shipments received at the Beatty, Nevada, burial site were identified by the state of Nevada during the previous SALP period and documented as unresolved items. The decision was made during this assessment period to classify the unresolved items as violations. A civil penalty was assessed by Nevada for the violations; therefore, no enforcement actions were initiated by NRC. No other problems were identified during this assessment. Overall, the transportation program has good implementing procedures and is well managed.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this area.

3. Recommendations

a. NRC Actions

NRC inspection effort should be consistent with the fundamental inspection program.

b. Licensee Actions

The licensee should consider the following action to improve performance in this functional area:

- ° The licensee should continue initiatives for improvement in radiological control areas to include continued improvement in procedural compliance and continued emphasis on self-identification of problems through comprehensive audits.

c. Maintenance/Surveillance

1. Analysis

The assessment of this functional area included all activities associated with either diagnostic, predictive, preventive or corrective maintenance of plant structures, systems, and components; procurement, control, and storage of components, including qualification controls; installation of plant modifications; and maintenance of the plant physical condition. It included conduct of all surveillance (diagnostic) testing activities as well as all inservice inspection and testing activities. Examples of activities included are instrument calibrations; equipment operability tests; postmaintenance, postmodification, and postoutage testing; containment leak rate tests; special tests; inservice inspection and performance tests of pumps and valves; and all other inservice inspection activities.

The maintenance/surveillance functional area was inspected routinely by the resident inspectors, periodically by regional inspectors, by a maintenance team inspection (MTI), and by a system entry retest team inspection (SERT).

The licensee's overall performance in maintenance has reached a level that is above that needed to meet regulatory requirements. Good plant performance, good safety system availability, and the observation of many strengths during the MTI conducted in January and February 1989 were indicators of the licensee's positive efforts in this area. Programmatic requirements were typically well defined, and were, for the most part, well implemented. However, the NRC identified a number of failures to meet regulatory requirements which can be traced to inadequate procedures, slow progress in procedure compliance, and isolated cases of poor work practices.

During the last SALP, the report briefly mentioned the licensee's excellent predictive maintenance program on the emergency diesel generators. The licensee has continued to expand this program. All safety-related and most balance of plant mechanical components have been included in a vibration

monitoring program. Other items trended include flow rates, pressures, temperatures, and instrument setpoint drift. The licensee indicated plans to further improve this program by consolidating trending systems and using enhanced computer trending software. These programs should have a positive impact on plant and safety-related system availability.

Many other strengths were observed by the NRC during this SALP period. The licensee has had an effective work order control system using a computer data base containing previous work experience, and comprehensive, retrievable equipment history. The maintenance backlog is less than half of what it was prior to the last SALP period. Also, the ratio of preventive to corrective maintenance has shifted significantly toward preventive maintenance, which is indicative of a preventive maintenance program that is functioning well. Interfaces between maintenance personnel and other organizations have been excellent. All departments appeared to work as a team to support plant operations and maintenance as observed by NRC. The training programs for maintenance personnel have been aggressive, and excellent skills training facilities have been utilized with mockups of plant equipment to serve as training aids.

In the last SALP, NRC noted weaknesses in maintenance procedures. In response to that concern, the licensee developed a Maintenance Procedure Upgrade Project similar to the one used in operations. As a function of need, biennial review due date and resource availability, procedure upgrades were prioritized, implemented, and tracked by management. As of the end of this SALP period, maintenance upgraded 426 of the 789 maintenance and surveillance procedures. The licensee has scheduled completion of this project for October 1990. Also, during this SALP period, the MTI identified a weakness where there were few component-specific corrective maintenance procedures for mechanical components.

Plant management placed emphasis on improving maintenance work package quality during this SALP period and issued a procedure compliance directive to maintenance personnel to ensure that they were aware of management's expectation that instructions found in work packages shall be treated like any station procedure. NRC findings, however, indicated that despite licensee management's initiatives toward procedure compliance, problems in this area still existed. While it was recognized that better quality procedures and work packages will help to reduce procedural violations, procedure violations identified during this SALP period have continued to be of concern to the NRC.

There were also a few instances where deficiencies were identified in work instructions and procedures. Inadequate work instructions regarding Okonite splices resulted in a failure to properly insulate the power splices made in a MOV actuator (MS-416) in June 1989. Licensee identified inadequate retest requirements resulted in two LERs. During the refueling outage, in October 1989, the licensee found the C Containment Fan Cooler running backwards in slow speed (the fan performs its safety function in slow speed). This fan was replaced while the plant was shut down for other reasons in October 1988. Failure to specify a retest that verified proper motor rotation in both fan speeds appeared to be the root cause.

During the latter half of this SALP period, the licensee assigned a new Maintenance Superintendent. LP&L's policy to rotate managers as part of their professional development has brought about a good depth of experience and interface perspective which appears to promote better teamwork. Overall maintenance staffing appeared to be good based on the plant's excellent material condition, the successful completion of the 1988 refueling outage on schedule with minimal problems on startup, and the reduced maintenance backlog. The third refueling outage (RFO-3) commenced on September 23, 1989, was well executed, and as of the end of this SALP period on October 31, 1989, the outage appeared to be on schedule. It was apparent that extensive planning and management involvement went into RFO-3. Good communications appeared to exist between management and staff and between departments.

A SERT team inspection was conducted at the end of this SALP period. This inspection identified inadequate program procedures for the licensee's temporary alteration activities that resulted in one violation for failure to provide for a retest of a temporary modification. The postmaintenance retest program was found to be satisfactory, but could be enhanced by inclusion of specificity on retest procedural requirements and acceptance criteria.

Historically, the licensee's surveillance test program has been well organized and correctly implemented in a timely manner. Most surveillance procedures have been adequate to the circumstances, and procedure noncompliance has not been a significant problem. However, an inadequate surveillance procedure for testing of main steam safety relief valves led to operation in a condition prohibited by TS on September 21, 1989 (as discussed in the operations area of this report). The test procedure was 9 months overdue for the biennial review and had not been selected for upgrading prior to use. In addition, during this SALP period the NRC identified weaknesses in the licensee's inservice test (IST) program, in that ASME Code Section XI requirements were not properly implemented. The most

significant problem was failure to apply appropriate acceptance values to pump recirculation flow. As a result, HPSI Pump B recirculation flow problems were not promptly resolved, when in fact the pump was degraded. This, as well as maintenance problems associated with the repair of the pump, was the subject of an enforcement conference held on May 8, 1989. Escalated enforcement action was proposed for this problem. The licensee's response to this action is under review. Another problem with the licensee's IST program was identified by the NRC in September 1989. The program failed to implement minimum stabilization run times for some pumps.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this area, with an improving trend.

3. Recommendations

a. NRC Actions

NRC inspection effort should be consistent with the fundamental inspection program. Regional initiative inspections should be performed in the area of maintenance procedures and inservice testing of pumps and valves.

b. Licensee Actions

The licensee should consider the following actions to improve performance in this area:

- ° Licensee management should assure that the completion of the maintenance and surveillance procedure upgrade program is both timely and of a high quality;
- ° Licensee management should evaluate the need for additional component-specific procedures to enhance maintenance program performance;
- ° Licensee management should continue with initiatives and incentives to assure procedure compliance;
- ° Licensee management should complete efforts to ensure the IST program is in compliance with the ASME code and the TS; and
- ° Licensee management should continue to expand the predictive maintenance program to further enhance safety equipment availability.

D. Emergency Preparedness

1. Analysis

The assessment of this functional area included activities related to the establishment and implementation of the emergency plan and implementing procedures, such as onsite and offsite plan development and coordination; support and training of onsite and offsite emergency response organizations; licensee performance during exercise and actual events that test emergency plans; administration and implementation of the plan (both during drills and actual events); notification; radiological exposure control; recovery; protective actions; and interactions with onsite and offsite emergency response organizations during exercise and actual events.

During the assessment period, region-based and NRC contractor inspectors conducted three emergency preparedness inspections. Two of these inspections consisted of the observation and evaluation of annual emergency response exercises. During the October 1988 exercise, the inspectors identified eight exercise deficiencies. During the 1989 exercise, the inspectors identified four exercise weaknesses. The exercise deficiencies and weaknesses identified during the SALP period pertained to information flow and the performance of some emergency responders during the exercises. The licensee's approaches to resolution of exercise weaknesses demonstrated a clear understanding and control of the issues. The licensee's approaches were technically sound and thorough.

The third emergency preparedness inspection conducted during the assessment period reviewed the operational readiness of the emergency response program. This inspection identified no violations or deviations.

Following the 1989 exercise, the licensee initiated a comprehensive review of Waterford emergency action levels (EALs) to determine whether improvements could be made in consistency and alignment with the EAL recommendations of NUREG-0654, Appendix 1. The licensee voluntarily committed to NRC to complete this review and any resultant procedure revisions by June 1990. This undertaking is an extensive initiative to further improve their emergency plan.

The absence of identified violations, the minor significance of the exercise weaknesses, and the corrective measures taken by the licensee indicated that: management control and corporate support of the emergency organization was excellent, decision making was consistently made at a level that ensured adequate management review, corrective actions were effective as indicated by lack of repetition of inspection findings,

emergency facilities continued to be upgraded and well maintained, training programs were well defined and implemented, and staff responsibilities were well defined.

The licensee has maintained a strong emergency preparedness program and a high level of emergency operational readiness. The inspection findings for this evaluation period indicate that weaknesses at the beginning of the period were effectively addressed, and the licensee maintains a strong program to protect the health and safety of the public.

2. Performance Rating

The licensee is considered to be in Performance Category 1 in this area.

3. Board Recommendations

a. Recommended NRC Action

NRC inspection effort should be consistent with the fundamental inspection program.

b. Recommended LP&L Action

None

E. Security

1. Analysis

The assessment of this functional area included all activities that ensure the security of the plant, that is, all aspects of access control, security checks, safeguards, and fitness-for-duty activities and controls.

Region-based physical security inspectors conducted two physical security inspections in this assessment period. A review of the Waterford Security program indicates that the licensee has maintained a very effective program. Problems identified have been aggressively pursued to resolution. The licensee has achieved several areas of significant strength because of a strong organization staffed with innovative and competent personnel. The Security Equipment Testing and Documentation and Training programs are performed well above the standards that are expected for a licensee. Also, the licensee's Access Control Program for personnel is a sophisticated program that exceeds the current standard established for the utility industry.

In all, inspectors identified three violations of regulatory requirements and noted that the licensee had identified five violations of regulatory requirements. One of the licensee-identified violations and one of the NRC-identified violations involved the control of safeguards information. These violations were discussed in an enforcement conference shortly after the end of the SALP period. These violations were not indicative of a programmatic breakdown.

The licensee submitted seven licensee event reports in the assessment period. The licensee later corrected most of the self-identified problems and was actively working on the remainder. As exhibited by the licensee event reports, the licensee has pursued an aggressive course of self-identification of potential violations.

Corrective actions started as a result of self-identified or NRC-identified violations have been technically correct and effective. Resolutions to technical issues are timely. Upper management has been supportive and actively involved in producing timely solutions to issues identified by the security staff at Waterford 3. Corporate management has been frequently and effectively involved in site activities. Hence, decisionmaking is consistently at a level that ensures adequate management review. In this SALP period, the licensee has maintained a full staff of security supervisors, fully qualified security officers, and security support personnel assigned to the security department. Authority and responsibilities associated with the security organization are clearly delineated and effective. The licensee's contract security force is adequately staffed and appropriately trained and equipped. The licensee is well underway in its efforts to establish a fitness-for-duty program that should satisfy the requirements of 10 CFR 26. The licensee has taken an aggressive approach to fitness-for-duty testing.

Overall, the licensee has established an excellent security program.

2. Performance Rating

The licensee is considered to be in Performance Category 1 in this area.

3. Board Recommendations

a. Recommended NRC Actions

NRC inspection effort should be consistent with the fundamental inspection program. Regional initiative inspections should be performed in the area of the Safeguards Information Protection Program.

b. Recommended Licensee Actions

None

F. Engineering and Technical Support

1. Analysis

The purpose of this functional area is to address the adequacy of technical and engineering support for all plant activities. The assessment of this area included all licensee activities associated with the design of plant modifications; engineering and technical support for operations, outages, maintenance, testing, surveillance, and procurement activities; training; and configuration management.

This functional area was inspected on an ongoing basis by the NRC resident inspectors and periodically by NRC region-based personnel. Emphasis was placed on plant modifications and modification testing.

The licensee has placed emphasis on establishing a strong, supportive engineering organization located onsite, and overall engineering and technical support performance appeared to have improved during this SALP period. Licensee actions in response to recommendations made in the previous SALP report and to concerns stated in NRC inspection reports during this SALP period appeared to be responsive and thorough.

During the assessment period, the licensee's engineering and technical support groups were evaluated by a special NRC team inspection. The licensee's engineering evaluation summaries associated with design change documentation did not appear to contain sufficient detail. In addition, NRC identified two instances where normally accepted levels of conservatism did not appear to have been utilized. The licensee has recognized these weaknesses, and has restructured their safety evaluations by issuance of an upper tier procedure, NOP-013, "10 CFR 50.59 Safety and Environmental Impact Evaluations," which was planned for implementation on December 31, 1989. The procedure implementation was scheduled to support completion of a training course on the procedures, guidelines, and the performance of evaluations required for all personnel who perform or review 10 CFR 50.59 evaluations.

The engineering workload was considered to be manageable in all areas except design engineering. With respect to design engineering, the largest backlogs were in the areas of modification package closeout and resolution of plant engineering information requests. The actual engineering effort was determined to be acceptable on the basis of a review of design change packages; however, there was evidence that design

engineering failed to account for historical plant design criteria. Two instances identified during this SALP period demonstrated this lack of historical plant design accountability. Both of these instances involved original plant design and construction conditions that were not recognized and accounted for during subsequent licensee modification evaluations. These instances resulted in a violation that involved an inadequate review of design requirements. One example of this violation involved the containment sump recirculation valve backup air supply accumulator. It was found that the accumulators were not designed or tested to ensure proper system operation for all conditions postulated by the design basis. A second example of this violation involved a modification to the static uninterruptible power supply. The power supply was modified by the addition of a nonsafety-related load to the distribution panel without accounting for the effects of load faults on the inverter operator.

The licensee developed and implemented a procedure to address formally situations where determination of equipment operability would require engineering support. This was done in response to an NRC concern during the last SALP period about the lack of timeliness in engineering support for operability determinations. The procedure, NOP-019, "Nonconformance/Indeterminate Qualification Process," was implemented early in this SALP period. The procedure requires an initial engineering evaluation which was promptly (usually within 24 hours) submitted to the shift supervisor so that he could make an operability determination with a sound technical basis. Then a detailed evaluation was performed followed by a corrective action plan. The engineering support of this process was, for the most part, timely and adequate to provide the assistance needed for the shift supervisors to make their operability determinations. Management involvement with operability determinations has also been strengthened by this process.

Reducing the number of temporary alterations has received considerable management attention over the past SALP period. As of the end of the third fuel cycle, only eleven temporary alterations were in place.

During this assessment period, inservice inspection (ISI) activities of the licensee were reviewed and found to be generally satisfactory, but problems were identified that suggest weaknesses exist in the review and approval process for special process procedures. Procedure problems resulted in the need to repeat a magnetic particle examination of reactor vessel nuts that was performed during the spring 1988 outage and to repeat the ultrasonic examination of circumferential welds that was performed during the fall 1988 outage.

In November and December of 1988, the licensee initiated a safety system functional inspection (SSFI) of the component cooling water (CCW) system. This inspection revealed some significant air operated valve actuator problems which led to an inspection of all 60 safety-related actuators and their support tubing. Generally, the types of problems found were unqualified positioners, tubing and regulators, insufficient volume in accumulators, and incomplete seismic qualification. The licensee is tracking each deficiency, and making operability determinations where appropriate. Although the above deficiencies are indicative of past poor performance in terms of plant design control, the licensee has been proactive in resolving the issue and the performance of an SSFI is considered a strength and indicative of management commitment to improved self-assessment activities.

Several violations were identified in this functional area, but only one was significant. The violation involved the issue of equipment qualification (EQ) where the licensee failed to establish fully qualification of Okonite T95/35 splice tape assemblies. The assemblies in question were located below the postulated submergence level inside containment and were for safety-related electrical terminations of installed instruments. An enforcement conference was held with the licensee to discuss the EQ issues related to the electrical cables and cable splices which may be subjected to submergence during and following a design basis accident. NRC maintained that the splices had not been adequately qualified for submergence and the licensee was subsequently cited for violating 10 CFR 50.49. The licensee already had a Justification for Continued Operation (JCO) dated March 16, 1989, which identified the equipment which had the splices subject to submergence and also identified alternate or backup equipment or other sources which provided the equivalent plant information. As corrective action, the licensee committed to move the splices above the postulated flood level during the fourth refueling outage. NRC followup of this issue was still open at the end of this assessment period.

The quality and accuracy of the plant simulator has been a priority for the licensee. During this SALP cycle, they reported incorporation of 92 simulator change packages to reflect more accurately actual plant conditions and performance.

Since implementing the systems engineering program in 1987, steady improvement has been observed in the quality and responsiveness of support to operations and maintenance. However, NRC noted weaknesses with the systems engineer program. During the MTI, it was found that some systems engineers displayed weaknesses in fundamental system knowledge and that there was no method for systematically disseminating industry operating experience to the systems engineers.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this area.

3. Recommendations

a. NRC Actions

NRC inspection effort should be consistent with the fundamental inspection program. Regional initiative inspections should be conducted in the area of engineering evaluations.

b. Licensee Actions

The licensee should consider the following actions to improve performance in this functional area:

- ° Continue with engineering training to establish a strong system knowledge base for systems engineers; and
- ° Evaluate the need for design basis reconstitution and training to ensure that designs being modified have acceptable bases, and account for historical plant design criteria.

G. Safety Assessment/Quality Verification

1. Analysis

The assessment of this functional area included all licensee review activities associated with the implementation of licensee policies; licensee activities related to amendment, exemption, and relief requests; response to generic letters, bulletins, and information notices; and resolution of Three Mile Island (TMI) items and other regulatory initiatives. The assessment of this functional area also included licensee activities related to resolution of safety issues, 10 CFR 50.59 reviews, 10 CFR Part 21 assessments, safety committee and self-assessment activities, analyses of industry's operational experience, root cause analyses of plant events, use of feedback from plant quality assurance/quality control (QA/QC) reviews, and participation in self-improvement programs. The assessment included the effectiveness of the licensee's quality verification function in identifying and correcting substandard or anomalous performance, in identifying precursors of potential problems, and in monitoring the overall performance of the plant.

This functional area was assessed on a continuing basis throughout the period. While the licensee has shown steady improvement in the assurance of quality, including management involvement and control, additional improvement is possible with increased management emphasis on good procedures, guidance on self critical approach to issues, increased emphasis on expanded corrective actions, and increased emphasis on improved communications with the NRC.

During the previous assessment period, NRC was concerned that Waterford-3 organizations, particularly QA, needed to demonstrate sustained critical self-assessment capabilities. Improvement in this area has been noted throughout the SALP period. The quality assurance organization was more proactive and involved in site activities. Site personnel have not been hesitant to identify potentially reportable events or significant operating problems per the licensee's corrective action program, as evidenced by the number and type of reports issued. Additionally, the licensee revised their upper tier procedure, NOP-005, "Corrective Action," in early 1989 to place additional emphasis on individual responsibility for reporting deficiencies.

However, the licensee's QA organization appeared to have a weakness in performing QA audits of the security program. The depth and effectiveness of the audit program in terms of uncovering weaknesses in the security systems, procedures, and practices was not adequately demonstrated in this SALP period. The two audits performed during the assessment period involved 13 man-weeks of effort and resulted in no findings. One of the audits covered, in part, the handling of safeguards information, but did not identify any weaknesses (that were subsequently identified late in the SALP period) in the handling of safeguards information. While there was involvement of security expertise from outside the licensee's organization, the technical expert's assistance was limited to a very narrow audit area. The licensee's audit planning program appears to be general rather than specific in scope.

Several violations, LERs, and observations made by NRC during the last SALP period indicated a need for the licensee to improve the effectiveness of its corrective action programs. In response to concerns identified in the previous SALP period, the licensee appointed a task force to review the issues identified by both the licensee and NRC. By July 1989 most corrective action program enhancements were implemented, except that root cause training was still in progress. Although improvements were noted in the corrective actions area, there were instances in which responses to NRC violations and corrective actions discussed in LERs were narrowly focused and only addressed the specific deficiency noted.

During the SALP period, seventeen (17) license amendments were issued which included a majority of items related to enhancements and license clarifications. During the current SALP period, the licensee received NRR approval of the IST and the ISI programs; however, subsequent inspections and an enforcement action (discussed in the maintenance/surveillance functional area of this report) revealed weaknesses in implementation and understanding of IST requirements.

Other notable licensing action reviews which were completed included the proposed anticipated transients without scram (ATWS) modifications, the detailed control room design review, and the initial activities for shutdown cooling/half loop operation. Only one issue on boron dilution, late in the period, resulted in a licensing review and issuance on an exigency/emergency basis. Several others, late in the period, were acted upon but required additional NRC effort for initial acceptance.

The last of the detailed control room design review items was scheduled to be completed in December 1989 which should complete the outstanding TMI and ATWS actions. The quality of licensee submittals, however, has declined toward the end of the SALP period. Several of the later licensing requests required additional responses or requests for additional information from the licensee before meaningful review could begin. This was brought to the licensee's attention, and although the licensee was aware of the inadequate requests and was working to correct the problem, a number of submittals that were made late in the SALP period continued to be of poor quality.

Management involvement continued to be evident in the planning and assignment of priorities and in coordinating site and licensing activities. The licensee has followed the technical resolution of other lead plants in implementing requested changes and is frequently involved in owners group programs. One area of strength is the implementation of the plant modifications to meet the requirements of the ATWS rule. Once the review was complete, the licensee took the lead for this class of plant design and installed and tested the systems during RFO-3.

During the SALP period, several generic letters and bulletins were issued which required a response by the licensee. Generic Letter (GL) 88-17, "Decay Heat Removal," required careful review to understand the licensee's position, but was eventually completed for the expeditious actions that are required by GL 88-17. During a followup on the licensee's actions in response to GL 88-17, a number of items were identified by NRC that were unresponsive to GL 88-17. In general, however, the licensee's responses have been timely and reflected a good understanding of the issues.

Licensee event reporting over the SALP cycle has been adequate with a few exceptions. Thirty-four LERs were issued during this SALP period, with about half of them closed as being satisfactory in content. There were isolated instances where event dates did not appear correct, root causes failed to reflect all the pertinent causes so that appropriate corrective action would be documented, or where corrective actions only addressed the specific problem that was reported.

During an inspection in January 1989, the staff found that vendor 10 CFR Part 21 reports were being appropriately reviewed by the licensee and that possible deviations were being evaluated. One problem was identified by a violation in which the licensee had not specified on procurement documents for basic components placed with the Okonite Company, that the provisions of 10 CFR Part 21 were applicable.

During inspections in January and March 1989, the staff found that procurement program controls were generally satisfactory. Enforcement actions taken in this SALP period have, however, included examples of inadequate dedication practices for commercial grade items and are indicative of a need for continuing licensee attention to this facet of the procurement process. The March 1989 inspection also identified examples in which applicable shelf-life requirements were not included in procurement documents and an absence of measures for control of items for which vendors had made unsolicited shelf-life recommendations. Items were also observed in storage without imposed shelf-life limitations and for which current procurement practices would require shelf-life information from vendors. The licensee has committed to the establishment of an overall program for control of limited shelf-life materials, including review of items currently stocked in warehouses.

The activities of the Safety Review Committee (SRC) were found to be well documented, with followup on items generally satisfactory. One violation was identified regarding the failure of SRC to perform certain 10 CFR 50.59 reviews, but this reflected more on the failure of the Plant Operations Review Committee (PORC) to input into the SRC. Activities of PORC were not, in general, well documented. In certain cases, the lack of detail regarding PORC meeting comments was such that actions on comments could not be verified. One violation was identified regarding the failure of PORC to meet in a quorum for all meetings. To a lesser extent, the Independent Safety Engineering Group was also found to be in need of improvement in regard to control and documentation of work activities.

2. Performance Rating

The licensee is considered to be in Performance Category 2 in this area.

3. Recommendations

a. NRC Actions

NRC inspection effort should be consistent with the fundamental inspection program. Regional initiative inspections should be conducted in the areas of the procurement programs, corrective actions followup on GL 88-17, licensee self-assessment activities, and the quality assurance audit program for security.

b. Licensee Actions

The licensee should consider the following actions to improve performance in this functional area:

- Continue to develop the enhanced corrective action program;
- Review PORC practices and procedures to enhance PORC performance;
- Enhance the effectiveness of quality assurance audits of the security area;
- Improve the procurement process with emphasis on proper dedication of commercial equipment for safety-related applications; and
- Improve the quality of submittals to NRC.

V. SUPPORTING DATA AND SUMMARIES

A. Licensee Activities

1. Major Outages

The unit was shutdown for the removal of a main feedwater system check valve flapper that was causing a metallic noise during power operations and replacement of reactor coolant pump seals, repair of a pressurizer spray valve, and refueling outage 3.

2. Power Limitations

None

3. License Amendments

During the assessment period, there were 17 operating license amendments.

4. Significant Modifications

- Removal of 122 snubbers;
- ATWS modifications;
- Modification of atmospheric dump valves to prevent potential control problems; and
- Modification of fuel alignment plate to minimize flow velocity at the thimble throat locations.

B. Direct Inspection and Review Activities

NRC inspection activity during this SALP cycle included 46 inspections performed with approximately 5161 direct inspection hours expended.

C. Enforcement Activity

The SALP Board reviewed the enforcement history for the period August 1, 1988, through October 31, 1989. This review included the deviations, violations, and emergency preparedness weaknesses and deficiencies tabulated by SALP Category in the enclosed table. A footnote is provided to identify any functional areas associated with civil penalties or orders.

D. Confirmation of Action Letters

None

TABLE
ENFORCEMENT ACTIVITY

FUNCTIONAL AREA	NO. OF VIOLATIONS IN EACH LEVEL							
	WEAKNESS	DEF.	DEV	V	IV	III	II	I
A. Plant Operations				1	9			
B. Radiological Controls					1			
C. Maintenance/Surveillance					12*	1(1)		
D. Emergency Preparedness	4		8		0			
E. Security					4	1(2)		
F. Engineering/Technical Support					6			
G. Safety Assessment/Quality Verification			1		9			
TOTALS	4		8	1	1	41	2	0

(1) A Notice of Violation and Proposed Imposition of a \$50,000 Civil Penalty was proposed on June 28, 1989, for improper testing of a HPSI pump and inoperability of the pump. The licensee requested reclassification of the violation to a Severity Level IV and full mitigating of the civil penalty. The licensee's response was still being evaluated at the end of the SALP period.

(2) A Severity Level III violation with no civil penalty was issued on December 1, 1989, for a violation involving inadequate control of safeguards material that occurred late in the SALP period.

*Two of the violations noted in the maintenance/surveillance functional area are also applicable to the plant operators functional area, but are only recorded in the maintenance/surveillance area.