U.S. NUCLEAR REGULATORY COMMISSION
REGION I
SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT 50-322/85-99

LONG ISLAND LIGHTING COMPANY
SHOREHAM NUCLEAR POWER STATION

ASSESSMENT PERIOD: MARCH 1, 1984 - FEBRUARY 28, 1985

BOARD MEETING DATE: APRIL 22, 1985

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1.0. INTRODUCTION

1.1 Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect available observations and data on a periodic basis and evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to licensee management to promote quality and safety of plant construction and operation.

A NRC Shoreham SALP Board, composed of the staff members listed in Section 1.2 below, met on April 22, 1985, to review the collection of performance observations and data and assess LILCo's performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of LILCo's performance at the Shoreham Nuclear Power Station for the period March 1, 1984, through February 28, 1985.

1.2 SALP Board

NRC SALP Board Members:

Chairman
R. W. Starostecki, Director, Division of Reactor Projects

Members

T. T. Martin, Director, Division of Radiation Safety and Safeguards
W. Kane, Deputy Director, Division of Reactor Projects
L. Bettenhausen, Chief, Operations Branch, DRS
H. B. Kister, Chief, Projects Branch 1, Division of Reactor Projects
J. Strosnider, Chief, Reactor Projects Section 1B
A. Schwencer, Chief, Licensing Branch 3, NRR
R. Caruso, Project Manager, NRR
P. Eselgroth, Senior Resident Inspector, Shoreham

Other NRC Attendees:

J. J. Joyner, Chief, NMSS Branch, DRSS
E. Kelly, Project Engineer, Reactor Projects Section 1B
W. Pasciak, Chief, BWR RPS, EPRPB, DRS
B. Bordenick, Office of the Executive Legal Director
N. Blumberg, Lead Reactor Engineer, OPS, OB, DRS
J. Berry, Reactor Engineer Examiner, RPS 1C, PB 1, DRP

1.3 Background

Long Island Lighting Company was issued Construction Permit CPPR-95 for the Shoreham Nuclear Power Station (Docket No. 50-322) on April 14, 1973. The permit authorized construction of a 2436 MWt General Electric BWR/4 reactor with a Mark II pressure suppression-type containment. General Electric was selected as the NSSS supplier and Stone and Webster Engineering Corp. as the architect engineer for the project. Construction was completed by a unified construction organization, termed UNICo, consisting of the licensee, their architect engineer, and General Electric personnel. Construction was complete at the beginning of this assessment period, with the exception of the new Colt diesel building, estimated to be 98% finished as of the end of this period. Operating License NPF-19 was issued on December 7, 1984, authorizing fuel loading and low power cold criticality testing at up to 0.001% rated thermal power or 24.36 kWt.

Licensee Activities

During this period, construction of the main facility was complete, and the Colt diesel building was finished, with the exception of painting and walkway installations. Run-in testing of the new 4430 kW Colt-Pielstick diesel engines was begun on February 14, 1985, and testing of all three engines is scheduled to be completed in April 1985. All pre-operational testing has been completed, all systems have been turned over to plant staff, and all test results have been approved and test exceptions resolved or designated for tracking and resolution during startup testing. The Transamerica DeLaval, Inc. diesel test recovery program was completed. To supplement the TDI diesels, and as an alternate source of electrical power during low power operation four mobile GM diesel generators and a 20 MW gas turbine with deadline, black-start capability were installed. Licensee personnel were extensively involved in resolution of NRC open inspection items and participation in the ASLB hearings during this period.

Fuel loading commenced on December 21, 1984, and was completed with relatively few problems on January 19, 1985. Initial criticality occurred on February 15, 1985.

Licensing Activities

Licensing hearings during the assessment period were conducted before three different Atomic Safety Licensing Boards (ASLB) on TDI diesel engine qualification, offsite emergency preparedness, and low power safety issues. Several licensing issues were resolved, as reported in four supplements (Nos. 5 - 8) to the SER. Staff FSAR review is now complete. The Office of Nuclear Reactor Regulation staff performed a major review, litigated before an ASLB, of a requested exemption from General Design Criterion (GDC) 17, Electric Power Systems, of Appendix A to 10 CFR Part 50.

A low power license authorizing fuel load and cold criticality testing (Phases I and II of low power operation) was issued on December 7, 1984. On February 12, 1985, the Commission ruled that the ASLB decision extending the low power license to Phases III and IV would become effective on February 19 (later extended to February 25), and a 5% power license could then be issued. However, on February 21, 1985, the Appeal Board vacated the ASLB's low power decision and remanded it for further consideration of security contentions. A full power license is dependent on ASLB decisions on emergency planning and the diesel generators. These Board decisions are currently scheduled for April and May 1985, respectively.

Inspection Activities

During this assessment period, approximately 5,200 hours of direct NRC inspection were expended at Shoreham, bringing the total number of NRC inspection hours at the facility to approximately 24,300 since 1973. Of the total hours during this one year assessment period, approximately 3,100 were performed by Region I-based specialist inspectors and 2,100 by resident inspectors stationed at the site. A senior resident inspector was on site throughout the assessment period, and another resident was on site until November 1984. A significant amount of inspection effort during this period was devoted to the resolution of open NRC inspection items prior to license issuance.

Two team inspections were performed by region-based specialists, assessing the Post-Accident Sampling System in February 1985 and Fire Protection/Safe Shutdown provisions in December 1984.

The results of the inspections described above and input from the NRC Office of Nuclear Reactor Regulation on licensing activities form the basis for the functional area analyses contained in Section 4 of this report. Further tabulations of inspection activities and associated enforcement actions are contained in Tables 3, 4 and 5. The percentage of total inspection time devoted to a functional area, tabulated in Table 5, is included at the heading of each area analyzed in Section 4.

2.0 CRITERIA

The following criteria were used as applicable in evaluation of each functional area:

1. Management involvement in assuring quality.

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

3. Responsiveness to NRC initiatives.

4. Enforcement history.

5. Reporting and analysis of Licensee Event Reports, 50.55(e) reports and Part 21 items.

6. Staffing (including management).

7. Training effectiveness and qualification.

To provide consistent evaluation of licensee performance, attributes associated with each criterion and describing the characteristics applicable to Category 1, 2, and 3 performance were applied as described in NRC Manual Chapter 0516, Part II and Table 1.

The SALP Board conclusions are categorized as follows:

Category 1: Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety or construction is being achieved.

Category 2: NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appeared strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

The SALP Board has also compared the licensee's performance during the last quarter of the assessment period to the overall performance for the entire SALP period. That comparison was used to trend licensee performance as "Improving", or "Consistent" (essentially the same), or "Declining".

The recommendations for NRC attention, where noted in each of the 10 functional areas assessed, are applicable if Shoreham remains in its presently-licensed low power (Phases I and II) operational conditions. Region I will allocate appropriate additional resources if the licensee is permitted to heat up and pressurize and continue with their Startup and Power Ascention Test Program up to (and beyond) 5% power. This is consistent with past staff practice for other newly-licensed facilities or those that have experienced extended long-term shutdowns.

3.0 SUMMARY OF RESULTS

3.1 Overall Facility Evaluation

Organizational changes were made at the beginning of the period, with the appointment of a new Chief Executive Officer on down through a new Plant Manager and a major reorganization of the nuclear operations staff. The new upper management includes individuals with significant operating experience and is considered a positive step in preparing for plant operation. The relocation of the Vice President - Nuclear Operations and most of the corporate engineering staff to the plant site contributed toward increased management involvement and improved support of plant staff and plant operations. Although design change responsibility principally remained with Stone and Webster throughout the period, transfer of responsibility to the LILCo engineering staff continued to increase with development of the Interim Station Modification Program.

Construction activity was essentially complete at the beginning of the assessment period, with the exception of the new Colt diesel generator building. Construction of this facility was completed near the end of the assessment period. The construction was performed in a high quality manner in accordance with codes and standards committed to by LILCo. The pre-operational test program also was finished during this period, and the resolution of test exceptions and approval of test results were found to be satisfactory. The startup test program was begun, with fuel load and initial criticality accomplished successfully with few minor problems. Startup test coverage was provided by NRC round-the-clock at the end of this assessment period, and the program was observed to be carefully and conservatively conducted, with appropriate staffing, procedures, and management attention.

Preparations for plant operations and development of operational support programs, including maintenance and surveillance, were planned and executed well in advance of license issuance, since the licensee had been anticipating fuel load prior to this assessment period. Radiological controls, surveillance procedures, and security measures were in place and adequately implemented, well in advance of license issuance.

The following weaknesses requiring improved management attention were identified during the period. Regarding actual plant operations, several weaknesses were noted with the control of plant evolutions and the timely resolution of QC deficiencies. The licensed operator requalification training program was judged during the period to be of high quality and successful. However, in regard to the initial license training program, a cold license class examined at the end of the period was found to be badly prepared, and the majority of candidates failed. This appears to have been the result of inadequate attention on the part of the training manager and not a flawed program.

It is our evaluation that the training department and its programs are generally good. The Operator Requalification Training Program, that was put in place prior to issuance of an operating license, is considered very good, and the training program for shift technical advisors is also strong. The training program for shift advisors required revision to include improved knowledge of plant specifics, but ultimately provided acceptable knowledge levels. As stated above, the poor performance on the cold license examinations is, in our evaluation, the result of inadequate management attention due to conflicting priorities and not representative of a programmatic breakdown.

In summary, the licensee has demonstrated effective management involvement and control of most plant activities during this period. It should be noted that these activities were conducted with no operational time constraints and that the licensee proceeded very conservatively in plant operations. The NRC will closely observe licensee performance, should a higher level power license be issued, to ensure that effective management and control of plant activities continues during ensuing phases of operation. In the interim, the licensee should continue their conservative approach to plant operations and ensure that other plant activities, such as training, maintenance, and surveillance are not adversely affected by conflicting priorities that detract from management involvement.

3.2 Facility Performance

Functional Area	Category Last Period (2/83-2/84)	Category This Period (3/84-2/85)	Recent Trend****
1. Construction Activities	***	1	Consistent
2. Engineering and Design	1	1	Improving
3. Pre-operational and Startup Testing	2**	1	None
4. Maintenance and Surveillance	1	1	Consistent
5. Plant Operations	*	1	Improving
6. Radiological Controls	1	1	Consistent
7. Fire Protection and Housekeeping	2	2	Improving
8. Emergency Preparedness	2	No Basis	None
9. Security and Safeguards	1	1	Consistent
10. Licensing	2	2	Consistent

*This area not previously evaluated.

**Previous SALP only evaluated the Pre-operational Test Program.
***In the previous SALP, this area was broken down into four separate functional areas.

****Trend during the last quarter (12/84 through 2/85) of current assessment period.

4.0 PERFORMANCE ANALYSIS

4.1 Construction Activities (17%)

During this assessment period, four inspections were conducted by region-based specialists addressing the construction of the new Colt diesel generator building and the settlement monitoring program.

Observation of ongoing structural concrete construction, inspection of in-place structural steel and a review of related Quality Control records demonstrated that these activities were conducted in accordance with applicable specifications, codes, standards, drawings, and procedures, as originally used in facility construction and as committed to by the licensee. In addition, examination of Quality Assurance field audits and discussions with licensee QA audit engineers indicated an effective QA program with respect to the Colt Emergency Diesel Generator Building.

The licensee has committed to evaluate settlement data for Category I structures other than the Reactor Building and consider procedures for addressing those structures through the life of the plant. The construction phase settlement monitoring program for the Colt diesel generator building was initiated with the first concrete placement in the basemat. The settlement monitoring program and the engineering design to accommodate differential settlement of interconnecting lines reviewed to date were considered good.

The overall QA/QC program implemented with respect to the Colt diesel generator building construction, including the management program the audit and inspection program, the procurement program and the vendor receipt and inspection program, were effectively organized and implemented. In addition, a review of S&W non-conformance and disposition reports related to safety-related HVAC components demonstrated good performance with respect to procedure and engineering disposition. The licensee's management have effectively demonstrated their involvement and control in assuring quality by well-planned and executed surveillance and audit of the architect engineer and contractor design/construction operations. The Quality Assurance Program for the Colt facility covered all aspects of the safety-related portion of it's installation, with engineering analysis and calculations to support identified nonconformances.

Conclusion:

Rating: Category 1
Trend: Consistent

Recommendations:

Licensee: See Section 4.10, addressing the need for an FSAR submittal which addresses the design criteria for the Colt diesel project.

NRC: Future SALPs will not include construction as a functional category.

4.2 Engineering and Design (9%)

The Interim Station Modification Program (ISMP) is intended to more fully utilize licensee personnel for design changes, while still maintaining design responsibility with Stone & Webster Engineering Corporation (SWEC) and maintaining the same level of quality as during construction. Region-based inspection of the ISMP was performed at the end of this assessment period. The Nuclear Engineering Department's (NED) development and control of design changes and their implementation of the ISMP was audited. This included the processing of design output packages, installation of station modifications, and closeout of work and update of affected documents and drawings.

Management attention was applied towards the program, as evidenced by the development of NED procedures and the involvement of the Review of Operations Committee (ROC) and the Design Review Committee (DRC). An example of ROC participation in the review of design changes was the replacement of timers in the MSIV-Leakage Control System. That modification, which replaced existing timers with longer timers in order to allow depressurization between the inboard and outboard MSIVs, was reviewed by ROC and recommended for further refined safety evaluation before approval of the work. The DRC was observed to consist of key NED personnel, as well as responsible personnel from plant staff and installation engineering, all of whom were knowledgeable and qualified. The DRC evaluates planned modifications, prepares scheduling, and assigns design responsibility to either contractors or NFD engineers. The approved 1985 workload was observed to be well planned and prioritized.

Safety evaluations associated with design output packages were found to be of sufficient depth, addressing the required criteria of 10 CFR 50.59. Supportive calculations were available on site, which addressed the bases for those evaluations. Further, responsible NED engineers were knowledgeable of their respective packages and capable of addressing technical details. This was especially evident of the MSIV-LCS modification.

The implementation of station modifications was found to be well controlled; and, in particular, the update or tracking of drawing changes to appropriately reflect as-built conditions was verified to be accomplished in accordance with procedures. Effective communication was evident among NED, Stone and Webster, Installation Engineering, and Operations engineers. Proper attention was given to turnover of completed modifications and system return-to-service from installation to operations. The Modification Engineering group has been observed to gain experience in installation.

NED is currently adequately staffed. Another positive step in the quality of design work is the licensee's development of an Engineering Assurance Group within NED. Most of the NED staff were reassigned to the site at the beginning of this assessment period, and effective communication and interface between plant staff and NED is evident.

The support of the onsite Stone and Webster Site Engineering Office (SEO) in resolving design questions and problems has been good. This was evident by their correct processing and approval of Engineering and Design Coordination Reports, which were reviewed as part of NRC follow-up of selected allegations during this period. SEO personnel were a cooperative and knowledgeable source of design information required to address those allegations.

The transition of design responsibility, with SWEC during construction to LILCo as plant operations evolve, has been effective and done well.

Conclusion:

Rating: Category 1
Trend: Improving

Recommendations:

Licensee: None

NRC: None

4.3 Pre-operational and Startup Testing (32%)

Pre-operational Test Program

Major testing conducted during the middle of this assessment period, which was witnessed and independently evaluated by NRC inspections, included the Integrated Electrical Test (IET) and special testing of the alternate AC emergency power sources for low power operation (20 MW gas turbine and GM mobile diesels). The IET was performed, using all three TDI diesels to verify independence among redundant onsite power sources and their load groups during plant response to a LOCA, both with and without a loss of offsite power, in five separate test runs. Independent NRC review of test results, including appropriate personnel and equipment actions, found them to be in accordance with procedural and regulatory requirements. Licensee management was present during, and intimately involved in, this last major test evolution. The total load on each diesel engine, with both core spray and all four RHR pumps running at rated conditions, ranged from 2650 to 2800 kW.

The pre-operational test program was verified to be satisfactorily completed, including resolution or tracking through startup program, of all pre-operational test exceptions. Management and technical involvement in test exception resolution and final test results review was evident and appropriate. Based on the above, the NRC's pre-operational test program was officially closed in October 1984.

TDI Diesel Recovery Program

The licensee's overall planning, staffing, and implementation for the retesting of the Transamerica DeLaval, Inc. (TDI) diesel engines has been aggressive and effective. Planning for the outage, teardown, inspection, and reassembly of EDG-102 was adequate with good staff coverage. However, the schedule for engine 102 slipped when EDG-101 and 103 were torn down for inspection.

Procurement of spare parts was a problem identified previously by the licensee's quality control, particularly with spare diesel connecting rod bearings and bushings. The number of part rejections by the licensee reflects poor vendor inspection. The licensee is implementing a program to require vendor NDE evaluations of bearings and bushings prior to shipment, in addition to onsite licensee inspections.

Startup Test Program

The QA/QC coverage of the startup program during this assessment period has been extensive. QC inspectors were observed to provide 100% surveillance coverage of fuel load activities, and QC performed

an independent verification of fuel bundle locations following fuel load. Careful planning for continuing QC extensive surveillance activities throughout the startup test program was noted. During the early review of the startup test procedures, a deficiency was noted in the licensee's review process, specifically, using acceptance criteria derived from General Electric startup test specifications, rather than those from the FSAR. The licensee took prompt, comprehensive action by performing and documenting an indepth review to correct these discrepancies and to assure that these differences did not exist in other procedures.

The initial fuel load was conducted successfully in an organized and conservative manner in accordance with the Technical Specifications. There was continuous communication between the refueling bridge and the control room during the fuel loading activities. The General Electric Company contract startup personnel performed their functions in conjunction with the operating staff. Verification of the core status after fuel load was comprehensive. Installation of the neutron sources, proper placement of the fuel assemblies into the reactor vessel and the achievement of initial reactor criticality were performed in a well-controlled and effective manner. The licensee's generally high quality procedures, procedure change control and personnel training have been strong contributors to their successful completion of these activities. When procedural or equipment difficulties were encountered, the licensee did not hesitate to halt work, assess the situation and take corrective steps to assure safe operations before proceeding.

The licensee's upper management have demonstrated extensive involvement in assuring quality of the startup program. This was evident through activities of the Review of Operation (ROC) committee, which meets on a daily basis to appraise day to day operation and evaluate technical issues. These transactions of ROC were closely reviewed, and meetings were randomly attended by NRC inspectors. During preparations for fuel load and throughout the fuel loading process and initial criticality, members of the plant management staff were visibly involved interfacing with and overviewing shift activities in the plant, particularly in the control room and on the refueling floor. This management presence has been evident during backshift and weekend hours, as well as during the dayshift.

Resolution of Open NRC Inspection Items

A significant effort was applied by the licensee towards the closure of open items from previous NRC inspections and in addressing TMI NUREG-0737 items, IE Bulletins and Circulars, and corrective action associated with violations. Also during this assessment period, all previously reported construction deficiency reports were resolved. There were approximately 70 deficiencies reported since construction began at Shoreham.

The licensee aggressively pursued resolution of NRC concerns, especially those with significance for fuel load and impending plant operation, such that only five items were included as conditions to the low power license. There were, on the average, over 100 and, at times, close to 200 open NRC items throughout the first half of this period. A team of 11 NRC inspectors spent two weeks onsite in April 1984 addressing 57 of those items and was able to resolve all or most issues due, in part, to the licensee's preparation, well-kept records, and responsiveness to the technical concerns raised. A Compliance Organization onsite has been in effect throughout this period. This group is devoted to tracking NRC findings, and has been responsible for presenting timely and thorough corrective actions in this area. Notable examples which were issues that had been identified in previous periods included the resolution of Reactor Building maintenance-induced flooding concerns, and the corrosion of components within the suppression pool air space. Sound technical arguments and corrective actions were ultimately presented by the licensee for these issues.

The licensee's effort to resolve IE Bulletins and previous NRC findings were prompt and complete. The records supporting the licensee's actions were readily available upon request. In those cases where further explanation was required, the licensee provided qualified personnel to provide detailed explanations in a timely manner. Therefore, the inspection verifications were carried out effectively. Where no action was required of the licensee by a specific bulletin, the licensee did verify that the particular problem did not exist for their plant. This area reflected notable LILCo management attention, particularly on the part of the Plant Manager and divisional supervisors, in making plant staff aware and available to resolve NRC's concerns, as well as coordinating Stone and Webster support.

Conclusion:

Rating: Category 1
Trend: None, due to intermittent nature of activities.

Recommendations: None

4.4 Maintenance and Surveillance (6%)

This evaluation is based on three inspections in these areas conducted by region-based specialists, as well as other observations during startup test inspections and by the resident inspectors.

Maintenance Programs

The maintenance program is staffed with qualified, knowledgeable personnel having an average nuclear experience level of eight years for supervisors and four years for technicians and mechanics. The total average maintenance experience level (nuclear and non-nuclear) is about double these numbers in each category. Staffing levels appear to be adequate to support corrective maintenance and surveillances; however, there do not appear to be sufficient numbers of personnel to support the preventive maintenance program. This fact was apparent in inspection of the instrumentation and control preventive maintenance program at the end of this assessment period. Understaffing in this area was evidenced by a backlog of I&C preventive maintenance actions, which was known and identified by the licensee and was attributed to a priority for technicians to support start-up surveillance testing.

The work control system is well defined and effectively controlled through the Maintenance Work Request (MWR) and the Station Equipment Clearance Permit (SECP) procedures. MWR and associated maintenance procedures have been routinely found in use during random resident inspector observations of maintenance work throughout the plant. Plant staff have effectively utilized a plan-of-the-day meeting to prioritize maintenance activities. The licensee has implemented several useful trend analysis programs to highlight important maintenance/equipment performance parameters to Station Management. Trend plots for numbers of instruments and, separately, numbers of annunciators in the control room requiring maintenance are notable examples. Both of these plots show a decreasing trend. The licensee has also established a data base information management system during this period for trending equipment history which will flag equipment failure rates that exceed a defined inquiry level of interest. This system was initially implemented for safety-related equipment, and the licensee intends to expand its use to non-safety-related equipment as well.

Surveillance Program

During initial operation under the low power license, several instances of inadvertent safety/protection system initiation were caused by instrumentation technicians. A more thorough briefing in the area of sensitive instrumentation, and greater attention to

detail by the technicians is warranted in order to reduce the frequency of unnecessary challenges to safety protection systems.

Extensive review by NRC of preparations for initial criticality indicates that an excellent surveillance test program is in place. Plant surveillance procedures and test results, inspected in support of startup activities, indicate that the system used by the licensee to assure that Technical Specification surveillances are satisfied is functioning well. Performance of several surveillances was witnessed. In one instance, a deficiency was noted in calibration checking of the front panel recorder (IRM Functional Test). The license took prompt action to correct this and other similar procedures (SRM Functional Test and APRM Functional Test) when informed by the inspector. All routine required surveillance tests were found to have been properly scheduled and performed in a timely manner. Operations personnel were aware of surveillance tests in progress and followed the implementation of each test closely. Most tests observed by NRC progressed well, with little or no procedural changes required, with the exception of the 18-month functional test of the MSIV leakage control system. This test, while being performed for the first time, did not proceed according to procedure and required several ad-hoc changes before being satisfactorily completed. Licensee personnel were observed performing this surveillance using a previously-deleted version of the test, while development of a workable procedure was underway. This was judged to be an isolated case based upon the observation of numerous other tests where, when procedural difficulties were encountered, approved procedure changes were issued before proceeding. Another problem involved inadequately developed procedures for the Leakage Reduction and Control Program for 9 of 12 systems outside of containment which may become contaminated or could contain primary coolant sources. The program, in response to NUREG-0737 Item III.D.1.1, was not fully implemented at fuel load as required by Technical Specifications.

Summary

In summary, the overall maintenance and surveillance functions appear to be well defined and effectively managed to support safe plant operation. Further, the licensee has had considerable experience or "practice" in this regard over the past two assessment periods, and previous SALP reports have noted continued improvement. Plant staffing and other aggressive improvements in this area, instituted during the last assessment period, have been maintained throughout the current period. However, management attention to improving their preventive maintenance resources, and towards elimination of unnecessary challenges to safety/protection systems (including review of experience at other nuclear plants), should be continued. While some instances of poor work controls were observed, these did not jeopardize plant safety. In fact, when a problem was recognized, work was stopped until the problem could be resolved.

Conclusion:

Rating: Category 1
Trend: Consistent

Recommendations:

Licensee: Increased attention should be given to the area of preventative maintenance and to reducing the frequency of unnecessary challenges to safety protection systems initiated by surveillance activities.

NRC: None

4.5 Plant Operations (14%)

Plant Operating Staff

The licensee has been successful in hiring an experienced Vice President - Nuclear Operations and has placed an individual with responsible nuclear experience in the Plant Manager position.

The need for on-shift operators with previous operating experience is a relatively recent requirement, to which the licensee responded by selecting several qualified individuals to act as shift advisors, until the licensed operators at Shoreham can accumulate sufficient operating experience of their own. Adequate plans have been made for numbers of licensed operators, and shift advisors are an interim measure to meet new NRC criteria.

Initial review by the NRC of the shift advisor training program identified a deficiency with the amount of on-shift plant specific familiarization training and a need for increased use of control room walk-through questions on the licensee's certification program. The licensee was responsive to these concerns, and NRC follow-up has found the licensee's subsequent actions to be satisfactory.

Licensed Operator Training Programs

The only activity in the area of initial licensed operator training during this period involved the conduct of NRC "cold license" examinations at Shoreham in February 1985. Examinations, both written and oral, were administered to 10 reactor operator candidates, three senior reactor operator candidates, and two non-LILCo employee Instructor Certification candidates. The results of these examinations were very poor and indicate a serious deficiency in the LILCo Initial License Training Program. Seven of the 10 reactor operator candidates and all three senior reactor operator candidates failed the examination. The evaluation of written and oral exam results indicate that their training did not adequately prepare the candidates for performing the duties of licensed operators.

A major reason for this breakdown appears to have been a lack of management attention to the progress of these candidates and a failure to observe, or act upon, the indications that this class was not properly trained. This lack of management attention is evidenced by the fact that no one in a supervisory position in either the training staff or plant operations staff participated in any pre-NRC exam audit or evaluation of these candidates. Additionally, a review of weekly quiz scores and the final written audit exam scores of this class indicate clear deficiencies in knowledge levels of some candidates which were either ignored or not believed by the LILCo staff. The first three groups of license exams conducted in 1982 and

1983 at Shoreham yielded very strong results and the training program was assessed as strong. The more recent class indicates that the candidates were not adequately trained and prepared.

After the preliminary examination results were developed, Region I management met with the licensee to review the situation and to try to assess the implications. Licensee management representatives acknowledged the existence of a problem in this area in that they had not been cognizant of the status of the class until after the NRC examinations. Cited were conflicting priorities with ASLB litigation, fuel load and initial criticality, and TDI diesel testing as contributing to the failure of licensee management to properly supervise and monitor the progress of this license class. On March 20, 1985, LILCo's Vice President - Nuclear met with Region I management and committed to aggressively pursue corrective action, including their own internal audit of the examinations (which verified the NRC findings), some disciplinary action, and a four-month augmented retraining program to be overseen by the LILCo Vice President - Nuclear Operations. An August 1985 re-examination of these candidates was proposed.

During the assessment period, the NRC continued its review of the Shoreham Licensed Operator Requalification Program. Although, by regulation, Shoreham was not required to have a Requalification Program in place until after the issuance of an operating license, LILCo has had an ongoing program since February of 1983. The NRC has continually been involved in the assessment of the adequacy of this program. The culmination of this assessment was the conduct of NRC-administered Requalification examinations to 25% of the licensed operators at Shoreham in November 1984.

The purpose of the NRC-administered examinations was to enable the NRC to make a determination as to the renewal of operator and senior operator licenses at Shoreham. Under the regulatory guidelines of 10 CFR Part 55.23(c)(2)(iii), NRC operator and senior operator oral and written examinations were given to six SROs and three ROs at Shoreham in November 1984. The results of these examinations were very good, with all candidates passing both the oral and written examinations and most candidates achieving high written exam scores. Based on these exams and the satisfactory results of other NRC inspections of the Shoreham Requalification Program, license renewals were issued to all operators at Shoreham beginning in March 1985.

Overall, the Requalification Program at Shoreham continues to be a very strong, operationally-oriented program. The program involves many innovative concepts, such as Technical Specification group exercises, control panel recognition drills, and on-paper malfunction exercises using detailed panel and annunciator drawings. The Program also actively involves both the licensed operators and non-licensed onshift personnel.

Plant Evolutions

During this assessment period, but prior to receipt of the low power license, two incidents occurred which revealed a need for improvements in the timeliness and thoroughness of incident follow-up. One incident involved a Radwaste system flexible piping connector which ruptured and caused flooding of the regenerator evaporator area, and the other involved an improper valve lineup for drainage of reactor vessel water that occurred twice, resulting in flooding of the drywell floor area. Concern over these events was expressed by the NRC; and, near the end of the assessment period, the licensee subsequently demonstrated significant improvements in timely and thorough evaluation of plant incidents.

Shoreham received its license to load fuel and test the reactor at up to 0.001 percent power on December 7, 1984. Fuel loading began on December 21, 1984, and was completed on January 19, 1985. The licensee achieved initial reactor criticality on February 15, 1985. During these early phases of plant operation, the licensee purposely established a conservative pace as a conscious step towards accommodating the existing experience levels of plant personnel. Licensee management is credited with taking the initiative months before the low power operating license was issued to implement plant administrative controls as if the plant had an operating license. For example, Technical Specification Limiting Conditions for Operation (LCO's) were identified and tracked, and plant management/NRC resident inspector notification of significant occurrences were made as they would be for an operating plant. The licensee was fully prepared to implement a well developed set of Technical Specifications at the time of low power license issuance.

The Control Room environment has continued, throughout this assessment period, to be characterized by a professional appearance and atmosphere of businesslike conduct. The licensed operators maintain the control room free of extraneous distractions and are routinely attentive to plant conditions and annunciators. During the initial stages of fuel load, the heavy incidence of support personnel interfacing with the Control Room resulted in a need for clarification and stricter enforcement of Control Room access controls; but, this was quickly resolved by plant management and shift supervision. Shift supervision has been effective at maintaining low background noise levels during the conduct of administrative duties with support personnel, to the benefit of licensed operator attention to plant operations and status. Based upon observations by NRC staff and management, the overall Shoreham Control Room environment is considered excellent.

Regular reviews by the resident inspector of the various control room logs (e.g., watch engineer (shift supervisor) log, temporary procedure change, lifted lead and jumper logs) have found the logs to be

complete, legible and accurate records of plant status. The resident inspector has also observed watch engineer shift turnovers, on many occasions, for proper review by the oncoming and offgoing watch engineers of the status of plant conditions, plant equipment maintenance and test status, logs and current directives. In all cases, shift turnovers were found to be well conducted. Also reviewed were the administrative controls contained in station procedures for returning systems to service which have been modified or repaired, in which areas were identified where clarification was needed in order to ensure that the watch engineer could determine what approvals are required prior to return to service. The licensee was responsive to these NRC-identified concerns and corrected the procedural inadequacies. The licensee has implemented a system to identify adverse trends in Licensee Event Reports, reports of abnormal conditions, and control room instrumentation and annunciator failures. The Review of Operations Committee (ROC) has been functioning smoothly in the review and approval of assigned procedures, tests and modifications.

The licensee's overall performance in the area of plant operation has been good; however, some areas for improvement have been noted. Some difficulties have been experienced with proper execution of some of the seemingly simpler tasks in the plant which are performed by an individually-assigned operator or technician. In recent months, these occurrences have included: two operator valve lineup errors involving reactor vessel and/or fuel pool water level changes; an improper blade guide movement; and four I&C technician-induced system trips - one reactor protection system trip, one emergency core cooling system trip and two reactor water cleanup system isolations. While these occurrences do not constitute safety problems individually, they do represent unnecessary challenges to safety systems and a general need for improvement by operators and technicians in their attention to detail. The licensee has taken corrective actions for these occurrences which should prove to be effective. Continued plant management attention to this area is warranted in order to ensure an improving trend. A need for improvement in the area of Operations management/shift personnel formal communications (Standing Orders and Night Orders) has also been identified. This was evidenced by omission of notification (from management to shift personnel) about the NRC/licensee temporary fire watch agreements and by issuance of shift directives that were not approved in accordance with the requirements for Standing Orders.

In summary, the licensee's operational performance has been generally good. The Shoreham plant management team has exhibited an alert, technically competent and conservative approach to plant operations.

Quality Assurance for Plant Operations

It is noteworthy that Operations and Maintenance management consider the assurance of quality for their department activities to be their

responsibility, rather than relying on independent QA organization overview of plant activities.

During the preparations for, and actual conduct of, fuel loading and initial criticality testing, the level of QC inspector involvement was noted to be satisfactory. Deficiency reports that were written by the licensee's QC inspectors indicated that a thorough overview of activities was provided. The BWR familiarization training provided to QC inspectors is considered to be a valuable enhancement of inspector knowledge levels in preparation for power operation. The licensee developed a revised QA Department organization, in conjunction with the transition from construction to operational (low power license) status, and submitted the necessary FSAR changes in September 1984. The licensee was issued a low power license in December 1984; however, as of the end of this assessment period, most of the quality assurance procedures reflecting these organizational changes had not been approved and issued. The QA Department Manager position, which had been vacant for nine months, was filled shortly after the end of this period. Formal updating of organizational changes requires more aggressive management attention.

During the early portion of the assessment period, senior licensee management brought to plant management's attention two problem areas that were characterized as "potentially significant trends adverse to quality." One involved late and/or incomplete responses to audit reports and, the other, failure to accomplish the necessary corrective and/or preventive actions within the committed times. NRC review of the Quality Control deficiency reporting/tracking system during the latter portion of the assessment period found the licensee's program, for ensuring that LILCo Deficiency Report (LDR) findings have corrective actions identified in a timely manner, to be lacking. This situation resulted in issuance of a violation. The licensee's initial response and corrective actions were considered by the NRC as insufficient; however, subsequent feedback regarding a more aggressive follow-up program for establishing LDR corrective actions resulted in a satisfactory response.

The Independent Safety Engineering Group (ISEG) is tasked by the Technical Specifications with overviewing plant operations. Subsequent to issuance of the low power license in December 1984, the ISEG was found to be spending 40% of its time on review and update of plant Systems Descriptions and only 20% of its time overviewing plant operations. This distribution of ISEG resources, relative to the priority of their safety overview role, was discussed with licensee management, and a satisfactory realignment of ISEG workforce utilization was made.

Conclusion:

Rating: Category 1.
Trend: Improving.

Recommendations:

Licensee: Continue plant management attention towards maintaining a low incidence of unnecessary challanges to safety/protection systems, ensuring attention to detail by operators and technicians, and improving communication between Operations personnel.

Continued upper management attention should be given to ensuring that the QA Department and ISEG group provide an effective quality assurance overview for plant operations.

NRC: The possibility of attrition of experienced staff members due to Shoreham licensing delays exists and should be monitored closely during the next evaluation period.

4.6 Radiological Controls (7%)

During this assessment period, there were seven inspections performed by region-based inspectors. Resident inspectors also checked radiological controls periodically. Radiation specialists inspected the licensee's radiation protection program, chemistry program, effluent monitoring and control program, and radioactive waste management and transportation programs. Also inspected were the licensee's preoperational testing of radioactive waste processing systems, effluent monitoring systems, and ventilation systems. A special team inspection of post-accident sampling capability, relative to guidance contained in NUREG-0737, was also performed.

During the previous assessment period, weaknesses were identified in the site radiological controls organization and in the definition of position responsibilities and authorities therein. During this assessment period, the licensee reorganized the plant Radiological Controls Division into three sections consisting of Health Physics, Radiochemistry, and Radioactive Waste. The responsibilities, authority, and selection criteria of each division position are appropriately defined. This reorganization is an improvement over the last assessment period and will provide for better control of radiological activities at the site. The Chemistry and Radioactive Waste sections were found to be not fully staffed; however, the licensee had hired contractor personnel to assist in performing the necessary functions of these sections during startup testing. Those contractor personnel were adequately trained and qualified for their responsibilities. The licensee is actively recruiting to fill identified vacancies. Regarding the corporate Radiological Controls organization, the licensee has formally established the organization, defined the responsibilities and authorities of the group, and defined the minimum selection criteria for each position specified.

The licensee has established a defined training and qualification program for personnel involved in radiation protection, chemistry and radioactive waste activities. No deficiencies in the currently established program were identified. Training records were complete, well maintained, and available. Reviews of licensee procedures for radiation protection, chemistry, effluent monitoring and release control, and radioactive waste handling found them to be explicit, controlled, and followed. Some deficiencies were identified in the licensee's airborne radioactivity surveillance procedures; however, these deficiencies were quickly addressed by the licensee when brought to his attention.

During this assessment period, licensee implementation of the guidance contained in a number of NRC Bulletins and Circulars was assessed by NRC inspection, addressing such matters as: packaging of low level waste for transfer and burial; identification and prevention of

unmonitored releases; control of plant staff work hours; and performance of safety evaluations for design changes to radioactive waste treatment systems. The licensee initiated timely, technically-sound responses towards these NRC initiatives, and their action on these Bulletins and Circulars demonstrated consistent evidence of prior planning and appropriate assignment of priorities in addressing concerns identified therein. The licensee also gave similar attention to recommendations provided in NRC Information Notices. For example, for a Notice describing instances of improper use of dosimetry devices (by personnel at other stations and in order to minimize recorded exposure), the licensee modified radiation protection procedures in order to identify, in a timely manner, any apparent misuse of dosimetry devices by Shoreham personnel.

The licensee's overview of and capabilities in the areas of chemical and radiochemical measurements were reviewed. The licensee has a well defined quality control program for chemical and radiochemical measurements. Procedures in this area address, among other matters, personnel qualifications, applicable acceptance criteria, and corrective actions for unacceptable findings. The licensee was provided with actual radioactive test samples (by the NRC) to determine his capability to measure radioactivity in effluents, and satisfactorily analyzed those samples with no identified deficiencies. Radiological controls for loading of neutron sources into the reactor were also observed by NRC inspections, with no unacceptable conditions identified.

An NRC team inspection assessed post-accident sampling capability, and found that the licensee's efforts in this area generally exceeded the minimum guidance specified in NUREG-0737. For example, the licensee constructed a separate building as a Post-Accident Sampling Facility (PASF). The PSAF is equipped with it's own ventilation system and in-line monitoring/analysis equipment which are capable of minimizing personnel exposure during sample collection. Some technical and administrative deficiencies were identified with the Post-Accident Sampling System (PASS), such as: completion of a maintenance program; high level effluent and chloride analysis capabilities; and, procedures for offsite transport. The licensee is aggressively moving to resolve these deficiencies. The PASS was not fully operational at the time of the team inspection; and, since the low power license required the establishment of all elements of the sampling program but no exemption to that license requirement had been obtained, the licensee was issued a violation. The licensee is currently training and qualifying all appropriate personnel on the operation of the PASS and anticipates full system operability prior to exceeding 5% power. Routine plant sampling systems are adequate for reactor operations below 5% power, and PASS availability would become significant only for power operation beyond that level.

Conclusion:

Rating: Category 1
Trend: Consistent

Recommendations: None

4.7 Fire Protection/Housekeeping (7%)

Fire Protection

Region-based inspectors conducted two inspections in this area, and regular resident inspector observations were also documented throughout this assessment period, addressing the control of combustible material, the maintenance of portable extinguishers, the conduct of fire watches and patrols, and related housekeeping.

No fires were experienced during this assessment period; and, as noted during the previous period, fire hoses, boxes and other equipment were accessible and regularly maintained operable. As discussed below, effective housekeeping practices consistently kept plant areas clean and free of debris. However, the safe shutdown team inspection, discussed later, identified eight deviations from commitments described in the Safety Evaluation Report (SER) and Five Hazards Analysis Report (FHAR). Fire watches, established during the last three months of this period as a result of the team inspection's findings, were observed to be diligent, and the licensee's audit and oversight of these activities was effective. Fire Protection Program responsibilities have been assigned to a full time fire protection engineer who reports to the maintenance engineer. Evidence of their dedicated involvement in the Program was observed by the outstanding job of monthly inspection of fire suppression equipment, including portable extinguishers. An example of the licensee's responsiveness to NRC concerns was the anchoring of portable emergency equipment lockers to prevent possible seismic damage to reactor building systems. Adequate fire protection and prevention provisions were also observed to be employed during the conduct of TDI diesel testing and fuel load.

The licensee exhibited a continued understanding and concern for fire protection issues, as illustrated by their intent to hire 10 additional fire protection technicians. These technicians' duties will include not only surveillance activities, but also fire brigade membership which will enhance the effectiveness and cohesiveness of brigade training by replacing the security force's involvement. Licensee management's involvement was demonstrated by the frequency and high level of brigade training provided and the quality and quantity of firefighting hardware found in equipment lockers throughout the plant. The licensee was responsive in addressing a NRC concern for the condition of certain fire doors (pressure equalization openings) by initiating a re-certification of the doors by Underwriters Labs. While the licensee's application of their QA Program in this area was judged to be thorough and comprehensive, the resolution of findings from the annual audit in January 1984 by the Shoreham Nuclear Review Board has not been prompt in that certain findings still remain open. The licensee had identified this problem in May 1984 and has since committed to expedite closeout and resolve future findings in a timely manner.

The safe shutdown team inspection identified eight deviations from commitments described in the Safety Evaluation Report (SER) and Fire Hazard Analysis Report (FHAR). Licensee management's evaluation of these issues, including their proposal of permanent corrective action, was quickly and thoroughly developed within five weeks. Following formal discussion at a management meeting with the NRC staff, a response to all deviations and unresolved items was provided two weeks hence. That response is currently under review by NRC, and follow-up of selected items is planned for April 1985.

The licensee's FHAR and CSAR for the Reactor Building were considered as technically sound; however, supportive information was generally unavailable on site, and the FHAR for outside of Reactor Building was lacking in detail and thoroughness. Procedures used to attain a safe shutdown from outside of the Control Room were found to be generally adequate in attaining an orderly and timely shutdown. Walkthrough of those procedures during the team inspection noted a lack of emergency lighting in certain Reactor Building areas where local operations are to be performed. However, operator training and knowledge of procedures appeared to be thorough. In general, fire protection features were observed by the team to be well-designed, save for the deficiencies noted.

Housekeeping

As a result of previously identified housekeeping problems, the licensee made a major increase in the size of the facility cleanup force during the last SALP period.

During this assessment period, the licensee has continued to make steady improvements in housekeeping at the plant. Particular areas inspected for cleanliness include the drywell, all elevations of the reactor building, the turbine building, the screenwell, the control building (including the TDI diesel generator rooms), the radwaste building, and the new Colt diesel generator building which was under construction during this period. The licensee has achieved and maintained a level of excellence in housekeeping, which has been noted and documented in six inspection reports within this period; and, this observation has been affirmed by NRC management and staff.

Conclusion:

Rating: Category 2
Trend: Consistent

Recommendations: None

4.8 Emergency Preparedness (3%)

One specialist inspection was conducted during this assessment period which addressed four unresolved items from the NRC's August 1982 Emergency Preparedness Appraisal.

The licensee is maintaining an active Emergency Preparedness Program and has issued detailed Implementing Procedures for the onsite Emergency Plan. The emergency training program is well defined, detailed for each specific assignment in the Emergency Response Organization and maintained by the Emergency Preparedness Organization. The Emergency Preparedness Program continues to receive extensive LILCo management involvement. There has been an aggressive approach to resolution of emergency planning issues and an extensive commitment of resources as indicated by the size of the Emergency Preparedness staff; seven licensee employees augmented by 13 contractor employees. Until an appropriate emergency response exercise is conducted, however, training effectiveness cannot be evaluated.

The full power phase of the Shoreham ASLB hearings involves offsite emergency planning issues heard before a separate Board, begun at the end of the last assessment period, and concluded in August of this period. In response to 32 technical inadequacies identified by FEMA, LILCo submitted Revision 4 to its Offsite Emergency Response Plan. Resolution of 24 of the 32 identified inadequacies had been accepted as of the end of this assessment period. A FEMA-graded exercise of Shoreham's offsite emergency plan is, as yet, unscheduled, although LILCo has requested such an exercise.

Conclusion:

Rating: No basis, due to limited observations.

Trend: None

Recommendations: None

4.9 Security and Safeguards (5%)

Analysis

During the pre-operational portion of the assessment period, plant management provided effective oversight in the development of the Security Program and organization. The licensee completed construction and equipment installation for the protected and vital areas, as described in the Physical Security Plan, in a timely manner prior to issuance of the low power license. In addition, several specialized security program enhancements, such as extra lighting around the intake area, anti-ramming devices at vehicle gates and additional television coverage of the protected area were implemented. During this period, the licensee identified an incident involving a compromised set of security examinations. Prompt and extensive corrective actions were initiated. This reaction demonstrated management's capability to analyze and take immediate action to mitigate and correct a potential problem.

The Security Program was implemented at an early date to ensure adequate training and qualification for the security force. This initiative was very effective. Additionally, a professional firearms qualification program is in effect. Armed personnel were observed by NRC inspectors to be proficient in the handling and use of weapons. Security force personnel were observed by the NRC staff to have progressively improved their capabilities during this portion of the assessment period and management's involvement was evident by a relatively trouble-free transition when the low power operating license was issued.

During the relatively short post-licensing portion of the assessment period, the licensee reported one security event in accordance with 10 CFR Part 73.71. This event involved a threat received by telephone. The security force was observed by NRC inspectors relative to interface with local law enforcement authorities and implementation of contingency plan actions. The security force was well coordinated and implemented required actions in a methodical and organized fashion while responding to the event. This is attributed to management's attention to the training and qualification of the security force and early implementation of the security program.

Three violations of security procedures have occurred during the post-licensing portion (since December 7, 1984) of the assessment period. One involved recordkeeping, and two involved failure to adhere to procedures by guard force personnel. One of the two procedural violations was of some concern to NRC, due to its potential indication of a training weakness in at least one member of the security force. An evaluation by the licensee of that perspective has been requested by the NRC, but was not due at the time of this report.

In order to obtain better insights into the licensee's training and qualification program, and because of training and qualifications deficiencies identified at other nuclear power plants, NRC conducted a special inspection in March 1985, during which members of the security force were randomly selected for re-examination in all phases of training. Excellent cooperation was received from licensee management personnel who carried out the re-examination effort in an organized and professional manner. The results: the re-examinations were very favorable and indicated that the security force can effectively perform the duties and responsibilities required by the NRC-approved Security Plan.

Conclusion:

Rating: Category 1

Trend: Consistent

Recommendations: None

4.10 Licensing

The licensee's management participated actively in licensing activities, many of which were associated with the TDI Diesel Generators hearings and the GDC-17 exemption proceedings.

Many significant licensee management changes occurred at the start of this assessment period. A new Chairman of the Board was named, who also serves as President and Chief Executive Officer of the company. A new Vice President - Nuclear Operations, with extensive nuclear experience, joined the company, and a Plant Manager with operational nuclear experience was assigned. These individuals, most notably the Vice President - Nuclear Operations, have participated actively in resolving licensing issues. The Senior Vice President, the Vice President - Nuclear Operations, and senior plant management attended the NRR Management Readiness meeting in October 1984. The Vice President - Nuclear Operations has been heavily involved in meetings to resolve TDI EDG problems and the GDC-17 proceedings. However, after the reorganization in April/May 1984, a promised FSAR revision describing the new management structure took inordinately long (five to six months) to provide.

The licensee's management consistently exercised firm control over its contractors' activities and maintained good communications between the contractor, their own staff, the NRR staff, and the NRR staff's contractors. We have noted, though, that the extensive litigation before the ASLB has had a chilling effect on the interchange of information related to contested issues. For example, in support of the TDI hearing on the "qualified load", the staff asked for detailed information on EDG loads in July 1984. We received a partial reply in November, which had been edited so carefully that much of the information it contained was technically useless. Many telephone calls and several more licensee submittals were necessary before the staff received useful answers. In a slightly different vein, the licensee proposed to use revised operating procedures and additional training to minimize the possibility of overloading the EDGs. Despite oral reminders to the licensee's representatives in November 1984, and a written reminder on December 11, 1984, a team of NRC reviewers found on January 16 - 17, 1985, that the procedural revisions were not complete and were, in some cases, inadequate. Furthermore, the team found that the training department had not been directed to develop a training plan for EDGs, despite the fact that hearings concerning the adequacy of that training were scheduled to begin on February 5, 1985.

The licensee's management and staff have demonstrated a satisfactory understanding of technical issues. The licensee initiated and provided major support to the TDI owner's group effort to resolve questions raised as to the adequacy of TDI diesel engines for nuclear service. In its presentation of its justification for

exemption from GDC-17, the licensee presented good technical justification. For these issues, the licensee's response to staff comments has generally been technically sound and presented in a thorough manner in extensive reports and meetings, as supported by test results. The licensee's proposal to do its own offsite emergency planning has been especially complete and thorough, notwithstanding certain legal problems associated with the plan.

In several other areas, such as implementation of Regulatory Guide 1.97 and the development of acceptable protection system setpoint methodology, the licensee's technical response could have been significantly improved by the submission of more detailed design information and a better technical justification for deviations. Additionally, the staff feels that the licensee should have tested the TDI EDGs at the engines' normal rated capacity of 3500 KW, instead of as-tested rating of 3300 KW, to establish a qualified load value of the engines. The licensee has taken credit for operational capability above 3300 KW; however, this issue is currently before the ASLB.

Because of Shoreham's stage of construction, relatively few NRC-initiated licensing issues were resolved during this rating period. The licensee's responsiveness to these few issues which arose varied widely. In general, issues which were required to be resolved prior to licensing, such as fire protection, TDI EDGs, process control program revisions, operator requalification, and equipment qualification, were addressed expeditiously. Issues which did not impact the issuance of a license, such as the operability of certain isolation valves, the development of a protection system setpoint methodology, and implementation of Regulatory Guide 1.97, dragged considerably. Other issues, such as the remote shutdown panel, thermal hydraulic code modifications, and the control of heavy loads, fell somewhere in between.

Conclusion:

Rating: Category 2
Trend: Consistent

Recommendations:

Licensee: Devote more attention to items not on the critical path for licensing. Lessen burden on plant staff with respect to hearings, where it conflicts with normal responsibilities. Also, as requested by NRR staff on several occasions, a detailed FSAR design description of the Colt diesel generator project, including codes and standards to be applied to its construction, is needed if these engines are to be relied upon for plant operation.

NRC: None

5.0 SUPPORTING DATA AND SUMMARIES

5.1 Investigations and Allegations

Three items were referred to the Region I Office of Investigations during January and February 1985. These items are currently under evaluation.

Three allegations received during the previous SALP period were found to be unsubstantiated and closed, as were the 40 allegations from a former steamfitter employed at Shoreham. The three allegations involved design and installation of cable trays and conduit, weld QA data, and the adequacy of BISCo pressure seals for piping penetrations. The 40 allegations from the steamfitter involved a variety of concerns associated with the construction, design and testing of the facility.

Allegations were received from three separate sources during the present SALP period and are still under evaluation. These involve concerns raised by a former Shoreham QC inspector and a former employee of two subcontractors at Shoreham. The other allegation involves a licensed reactor operator's qualifications.

5.2 Escalated Enforcement Actions

Civil Penalties: None.

Orders

The three Atomic Safety and Licensing Boards (ASLBs) presiding over the Shoreham OL Proceeding, the Appeal Board (ASLAB), and the Commissioners issued Memoranda and Orders as needed to support the ongoing hearings.

Confirmatory Action Letters

One Confirmatory Action Letter (CAL 84-25) was issued on December 7, 1984, concerning compliance with Criterion 3, Fire Protection, of 10 CFR 50, Appendix A, General Design Criteria for Nuclear Power Plants.

Enforcement Conferences: None.

5.3 Management Conferences Held During the Assessment Period

On November 16, 1984, NRR met with the licensee at the plant site for a review of the licensee's readiness for a low power license, which was issued on December 7, 1984.

Other NRR site visits during the period included four regarding the TDI Emergency Diesel Generators and three General Design Criterion 17 exemption reviews.

A management meeting was conducted March 1, 1985, at Region I to discuss candidate performance during the February 18, 1985 cold license examinations at Shoreham. In addition, the LILCo Vice President - Nuclear met with Regional management to discuss corrective actions regarding the cold license exams on March 20, 1985.

Visits to the Shoreham site were made by NRC Commissioners Zech, Bernthal, and Asselstine.

5.4 Exemptions Granted

The following exemptions to Appendix A, General Design Criteria, of 10 CFR Part 50 have been granted:

GDC-2 - Seismic qualification of certain equipment;
GDC-56 - Redundant containment isolation barriers;
GDC-19 - Remote shutdown capability.

5.5 Construction Deficiency Reports (CDRs)

Three CDRs were submitted by the licensee during this assessment period. The CDRs are described in Table 1. Review of these CDRs identified no causal linkages.

5.6 Licensee Event Reports (LERs)

Eight LERs were submitted during the last quarter of this assessment period. The LERs are characterized by cause in Table 2. No causal linkages were identified.

5.7 Part 21 Reports

Louis Allis submitted a report under 10 CFR Part 21 to NRC Region I on March 6, 1985, concerning seven cracked welds found in coil guard conical baffles installed on the Colt diesel generators at Shoreham. Proposed corrective action included weld repair and an inspection of similar units.

TABLE 1

CONSTRUCTION DEFICIENCY REPORTS

Shoreham Nuclear Power Station
(March 1, 1984 - February 28, 1985)

CDR No.	Deficiency	Cause Code
85-00-01	Emergency Diesel Generator Turbocharger Failure	Design/Fabrication Error
84-00-02	Corrosion of Emergency Service Water Strainers	Design/Fabrication Error
84-00-03	Motor Control Center Room Duct Penetration Not Sealed	Design/Fabrication Error

TABLE 2

LICENSEE EVENT REPORTS BY FUNCTIONAL AREA

Shoreham Nuclear Power Station
(March 1, 1984 - February 28, 1985)

Area	Number/Cause Code	Total
4.1 Construction Activities		-
4.2 Engineering Design		0
4.3 Pre-op and Startup Testing	2/A, 1/B	3
4.4 Maintenance and Surveillance		0
4.5 Plant Operations	1/A	1
4.6 Radiological Controls		0
4.7 Fire Protection and Housekeeping	2/A, 1/D	3
4.8 Emergency Preparedness		0
4.9 Security and Safeguards	1/X	1
4.10 Licensing		-
	Total	8

Cause Codes:

A - Personnel Error
B - Design, Manufacturing, Construction or Installation Error
C - External Cause
D - Defective Procedure
E - Component Failure
X - Other

TABLE 3

ENFORCEMENT SUMMARY

Shoreham Nuclear Power Station
(March 1, 1984 - February 28, 1985)

A. Number and Severity Level of Violations and Deviations

Severity Level	Number
Severity Level I	0
Severity Level II	0
Severity Level III	0
Severity Level IV	2
Severity Level V	5
Deviations	9

B. Violation vs. Functional Area

Functional Area	Severity Level IV	V	Deviation
1. Construction Activities			
2. Engineering and Design			
3. Pre-operational and Startup Testing			1
4. Maintenance and Surveillance	1	1	1
5. Plant Operations		2	
6. Radiological Controls		1	
7. Fire Protection/Housekeeping			7
8. Emergency Preparedness			
9. Security and Safeguards	1	1	
10. Licensing			
Totals	2	5	9

C. Violation Details

Report Number/ Inspection Dates	Severity Level/ Functional Area	Subject
84-31 7/23-26/84	Deviation/ Startup	Certain test conditions and acceptance criteria in HPCI and RCIC startup tests do not conform to FSAR descriptions.
84-46 12/3-7/84	Deviation/ Fire Protection	Improper spacing of fire detectors in Reactor Building.
	Deviation/ Fire Protection	Fire doors degraded because of security modifications.
	Deviation/ Fire Protection	Improper routing of fire pump cables in electric fire pump room.
	Deviation/ Fire Protection	No fire damper in duct between HVAC and Chiller rooms.
	Deviation/ Fire Protection	Inadequate carbon dioxide density in Battery Room and cable tunnel.
	Deviation/ Fire Protection	Fire detectors in computer room located above suspended ceiling.
	Deviation/ Fire Protection	Emergency lighting not available in all areas.
84-50 12/15/84-1/31/85	Level V/ Plant Operations	Improperly approved Operations Administrative Directives in use in the control room.
	Level V/ Plant Operations	Twenty-three LDR dispositions not approved by QA within required time period.
85-04 2/11-15/85	Level V/ (proposed) Radiological Controls	Failure to establish all PASS program elements consistent with low power license requirements.
85-05 1/21/84-1/25/85	Level IV/ Security	Inaccurate inventory of standby lock cores.
	Level V/ Security	Inadequate search of a vehicle entering the protected area.

C. Violation Details (Cont'd.)

Report Number/ Inspection Dates	Severity Level/ Functional Area	Subject
85-08 1/28/85-2/1/85	Deviation/ Surveillance	QC inspectors lacked proper eye test certification.
	Level IV/ Surveillance	Failure to fully establish procedures for the Leakage Reduction Control Program in accordance with Technical Specifications.
85-12 2/19-22/85	Level V/ Maintenance	Failure to meet procedural requirements for scheduling of I&C preventative maintenance.

TABLE 4

INSPECTION ACTIVITIES

Shoreham Nuclear Power Station
(March 1, 1984 - February 28, 1985)

Report No.	Inspectors/ Hours	Areas Inspected
84-07	Specialist/ 56 hours	Pre-operational Procedure and Test Results Review and TDI diesel engine repairs.
84-08	Specialist/ 34 hours	Radiation Environmental and Meteorological Monitoring Programs.
84-09	Specialist/ 28 hours	TDI Diesel Generator Test Recovery Program.
84-10	Four Residents/ 435 hours	Resolution of eight previous open items, 11 NUREG-0737 items, IE Bulletin 79-08 and Circular 79-24; Review of April 14, 1984 Loss of Power, TDI Diesel Overhaul, and Potential for Maintenance-Induced Reactor Building Flooding.
84-11	Specialist/ 88 hours	TDI Diesel Generator Test Recovery Qualification and Revalidation Program.
84-13	Three Specialists/ 84 hours	Chemistry Program and Effluents Radiation Monitoring.
84-14	11 Specialists/ (Team) 440 hours	Resolution of 57 previous Open Inspection Items; Review of Operational Staffing and Plant Operating Procedures.
84-16	Specialist/ 61 hours	Pre-operational Test Procedure Review and Results Evaluation; Integrated Electrical Test Witness.
84-17	Specialist/ 14 hours	Review of Radiological Outstanding Items; IE Bulletin 80-10; IE Circulars 77-14, 80-14, and 81-09; Control Room and RBSVS HVAC Testing.
84-18	Two Specilists/ 317 hours	Resolution of 14 previous open inspection items, observation of TDI diesel testing, and follow-up of Radwaste Building flooding.
84-19	Two Specialists/ 68 hours	Security Program Implementation.

Table 4 (Cont'd.)

Report No.	Inspectors/ Hours	Areas Inspected
84-20	Specialist/ 39 hours	Startup Test Program Administrative Controls and Personnel Training; IE Bulletin 80-17, CRD-SDV Modifications.
84-21	Specialist/ 30 hours	Follow-up of Outstanding Items concerning Radiography; IE Bulletins 80-08 and 13, 82-01 and 03, and 83-02.
84-22	Two Specialists/ 58 hours	Fuel Load and Initial Startup Test Program Planning.
84-23	Three Residents/ 213 hours	Colt Diesel Project, Resolution of Open Items, IE Bulletin 80-06 (ESF Reset), Allegation on BISCo Seals, and NUREG-0737 Item II.B.4 (Training for Mitigating Core Damage), and Follow-up on Security Incident.
84-24	Specialist/ 31 hours	Construction of Colt Emergency Diesel Generator Building - Civil/Structural Activities and Settlement Monitoring.
84-25	Specialist/ 20 hours	Outstanding Items, Circulars, Bulletins.
84-26	Two Specialists/ 46 hours	Evaluation of Pre-operational Test Exceptions; NUREG-0737 Item I.D.2 - SPDS; Witness of Backup Emergency Electrical Power (EMDs and Gas Turbine) Testing.
84-27	Three Specialists/ 89 hours	Fuel Load and Initial Startup Test Program Procedures; Bulletin and CDR Follow-up.
84-29	Two Residents/ 281 hours	Routine Resident Inspection of Open Items, Allegations, TDI Engine and Integrated Electrical Testing.
84-30	Specialist/ 12 hours	TDI Diesel Outstanding Items.
84-31	Specialist 31 hours	Startup Test Procedure Review.
84-32	Two Residents/ 235 hours	Resolution of Open Items, Plant Modification Controls, Equipment Trending, Colt Building Construction and EMD Testing.

Report No.	Inspectors/ Hours	Areas Inspected
84-33	Three Specialists/ 63 hours	NUREG-0737 Items II.E.4.1 and 2, Dedicated Hydrogen Penetrations and Isolation Valve Dependability.
84-34	Specialist/ 36 hours.	Security Program Implementation and Review of Open Items.
84-35	Specialist/ 35 hours	Outstanding Items and Related Electrical Discipline Bulletins; Colt Diesel Building Construction.
84-36	Four Specialists/ 128 hours	Colt Diesel Building Construction; HVAC Electrical and Vendor Installation.
84-37	Specialist/ 26 hours	Completion of the Pre-operational Test Program.
84-38	Three Specialists/ 96 hours	Fire Protection/Prevention Program Administration, Organization and Controls.
84-39	Resident/ 120 hours	Review of previous Open Items; TDI Diesel Testing; Equipment Storage; LPCI MG-Set Field Inspection; Administration of Security Guard Examinations.
84-41	Specialist/ 23 hours	Settlement monitoring of structures; Colt Diesel Program QC Documentation.
84-42	Specialist/ 21 hours	Status of, and training for, Fuel Load and Startup Test Program.
84-43	Specialist/ 19 hours	Radiological Controls Program Organization and Staffing; Related Outstanding Items, Bulletins and Circulars, and IE Notice 84-59.
84-44	Specialist/ 23 hours	Colt Diesel Piping and Supports; IE Bulletins 83-06 and 07 (Tubeline and Ray Miller).
84-45	Resident/ 70 hours	Resolution of Seven Previous Outstanding Items and CDR 84-02 (Service Water Strainer Corrosion); Bahnson HVAC Weld Deficiencies; Follow-up of Drywell Floor Spills - Valve Lineup Controls and Fuel Support Piece Misalignment; Witness of TDI Diesel Fatigue Cycle Testing and Handling of Neutron Sources; NRR Operational Readiness Inspection Tour (November 15 and 16).

Report No.	Inspectors/ Hours	Areas Inspected
84-46	Four Specialists/ (Team) 236 hours	Fire Protection and Safe Shutdown Capability.
84-47	Two Specialists/ 38 hours	Fuel Load and Initial Startup Test Procedures; Drywell Vacuum Breaker Surveillance.
84-48	Two Specialists/ 38 hours	Review of pre-fuel load activities and witness of neutron source loading; procedures for Tech Spec Surveillances during refueling; IE Notice 84-76, Loss of All AC Power, applicability to STP-31 at Shoreham.
84-49	Three Specialists/ 169 hours	Witness of initial fuel loading and control rod friction and shutdown margin testing, including independent verification of SRM data, rod timing and accumulator pressures; RBSVS isolation valve stroke testing.
84-50	Resident/ 199 hours	Control of Plant Operations; ISEG Activities; Shift Turnover and Log Reviews; QA Deficiency Follow-up.
84-145	Examiner/ 10 hours	Shift Advisor Program.
85-01	Two Specialists/ 108 hours	Witness of fuel load activities, including final core verification of fuel bundle location; Re-installation of vessel internals and head; IRM/SRM Surveillance Testing; GETARS Calibrations.
85-02	Specialist/ 32 hours	HVAC installation and Bahnson equipment deficiencies (IE Notice 84-30).
85-04	Six Specialists/ (Team) 208 hours	NUREG-0737 Items II.B.3, PASS; II.F.1.1, Noble Gas Effluent Monitoring; II.F.1.2, Plant Effluent Sampling; II.F.1.3, Containment High Range Monitors; and III. D.3.3, In-plant Iodine Monitoring.
85-05	Two Specialists/ 75 hours	Security.
85-06	Specialist/ 108 hours	Follow-up of four Emergency Preparedness Appraisal Previous Open Items.

Report No.	Inspectors/ Hours	Areas Inspected
85-07	Three Examiners/ 144 hours	Operator Licensing Exams.
85-08	Specialist/ 38 hours	NUREG-0737 Item III.D.1.1, Leakage Reduction Program, Administrative and Surveillance Procedures.
85-09	Three Specialists/ 262 hours	Witness and review of Initial Criticality and Startup Test Results; Surveillance Test Program Review.
85-10	Project Engineer/ 24 hours	Eight allegations made by former QC inspector.
85-11	Resident/ 188 hours	QA Department Staffing and Personnel Qualifications; NED Administrative Controls; Follow-up of Open Items
85-12	Two Specialists/ 47 hours	I&C Preventative and Corrective Maintenance Programs.
85-19	Three Examiners/ 120 hours	Operator Requalification Exams.

TABLE 5

INSPECTION HOURS SUMMARY

Shoreham Nuclear Power Station
(March 1, 1984 - February 28, 1985)

	Functional Area	Hours	% of Time
1.	Construction Activities	872	17
2.	Engineering and Design	465	9
3.	Pre-operational and Startup Testing	1,664	32
4.	Maintenance and Surveillance	328	6
5.	Plant Operations	742	14
6.	Radiological Controls	379	7
7.	Fire Protection/Housekeeping	372	7
8.	Emergency Preparedness	132	3
9.	Security and Safeguards	247	5
10.	Licensing	*	*
	Total	5,201**	100

*Hours expended in facility licensing activities and Operator Licensing activities are not included with direct inspection effort statistics.

**Excluding a total of 274 hours expended on Operator Licensing examinations during the assessment period.