U. S. NUCLEAR REGULATORY COMMISSION
REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
INSPECTION REPORT 50-293/85-99

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

ASSESSMENT PERIOD: OCTOBER 1, 1984 - OCTOBER 31, 1985

BOARD MEETING DATE: DECEMBER 18, 1985

TABLE OF CONTENTS

I. INTRODUCTION

A. Purpose and Overview

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

An NRC SALP Board, composed of the staff members listed below, met on December 18, 1985, to review the collection of performance observations and data to assess the licensee 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 the licensee's safety performance at Pilgrim Nuclear Power Station for the period October 1, 1984 through October 31, 1985.

B. SALP Board Members

Chairman:

R. Starostecki, Director, Division of Reactor Projects (DRP)

Members:

S. Ebneter, Director, Division of Reactor Safety (DRS)
W. Kane, Deputy Director, DRP
E. Wenzinger, Chief, Projects Branch No. 3, DRP
J. Joyner, Chief, Nuclear Material Safety and Safeguards Branch, Division of Radiation Safety and Safeguards (DRSS) (part time)
R. Bellamy, Chief, Emergency Preparedness and Radiological Protection Branch, DRSS (part time)
L. Tripp, Chief, Reactor Projects Section 3A, DRP
M. McBride, Senior Resident Inspector
W. Minners, Chief, Safety Protection Evaluation Branch, NRR
P. Leech, Project Manager, NRR

Other Attendees

J. Johnson, Chief, Operational Programs Section, DRS
G. Meyer, Project Engineer, DRP
W. Pasciak, Chief, Effluent Radiation Protection Section, DRSS (part time)

D. Sullivan, Performance Appraisal Section, Office of Inspection and Enforcement (OIE)
J. Sharkey, Performance Appraisal Section, OIE
W. Lazarus, Senior Emergency Preparedness Specialist, DRSS (part time)

C. Background

1. Licensee Activities

The SALP assessment period began during a recirculation piping replacement outage. The outage began in December 1983 and ended on December 24, 1984. Fuel was reloaded into the reactor core in November 1984. A hydrostatic pressure test of the reactor coolant system and an integrated leakage test of the primary containment were conducted in December 1984. On December 24, 1984, reactor criticality was established and a slow startup sequence was initiated. The reactor was briefly shut down on December 25, 1984, due to fluctuating reactor water level instruments.

On January 1, 1985, the reactor was shutdown for seven days when loose debris was detected in the standby liquid control system (SLCS). Maintenance on leaking torus to drywell vacuum breakers was also conducted during the shutdown. The reactor was restarted on January 7, 1985 and reached full power on January 30, 1985.

The reactor was subsequently shutdown between February 9 and 15, 1985, to repair bearings in the "A" recirculation pump motor. During the startup on February 15, a primary coolant system leak was detected in a weld in the reactor vessel drain line. The shutdown was continued until February 17, 1985 when repairs were completed on the line.

The reactor scrammed on March 15, 1985 due to a sticking reactor water level instrument manifold valve during a routine surveillance test. While the reactor was shut down, maintenance was conducted on the reactor water sample system (needed for a subsequent hydrogen injection test) and on secondary containment dampers. The plant was restarted on March 20, 1985, and operated until April 4, 1985 when the reactor scrammed due to high main turbine vibration. The plant was returned to service on April 5, 1985.

On June 14, 1985, the reactor scrammed during low power maneuvers due to an inadvertent high reactor water level isolation. The plant was restarted on June 15 and operated until September 1, 1985 when the reactor scrammed following a generator load rejection. The reactor was restarted five days later, following repairs to the "B" recirculation pump seal. The startup was halted and the reactor shutdown on September 5, 1985 for additional repairs to the "B" recirculation pump seal. On September 7, 1985, the reactor was restarted and it operated until the end of the assessment period.

A hydrogen injection experiment was conducted between May 9 and 13, 1985 to test the effect of feedwater hydrogen on plant radiation levels. The annual emergency preparedness exercise was conducted on September 5, 1985. Hurricane Gloria was in the vicinity of the plant on September 27, 1985. Wind speed reached 75 miles per hour onsite. Power was reduced to less than 25% and the generator was taken off line. No storm damage to the station occurred.

2. Inspection Activities

Two NRC resident inspectors were assigned to the Pilgrim Nuclear Power Station between October 1984 and July 1985. One resident inspector was assigned between July and the end of the assessment period. The total NRC inspection effort for the period was 3793 hours, distributed in the appraisal functional areas as shown in Table 3. This represents 3501 hours per twelve month period.

Team inspections were conducted during the assessment period to examine the following areas:

-- Plant readiness for restart from the 1984 recirculation pipe replacement outage,

-- Emergency plan remedial drill,

-- Emergency planning program,

-- Health physics program,

-- Licensee-vendor interactions,

-- Annual emergency plan exercise,

-- Radiochemistry program (using the NRC mobile laboratory), and

-- Refuel bridge damage.

Tabulations of violations and inspector activities are presented in Tables 4 and 6, respectively.

The area of fire protection was not rated this period since there was no overall inspection of the program. Inspection hours in this area were primarily limited to resident inspector observations in the plant. Housekeeping was considered in each of the appropriate functional areas.

II. CRITERIA

Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction, preoperational, or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement and control 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 reportable events
6. Staffing (including management)
7. Training and qualification effectiveness

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

Category 1. 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 so that a high level of performance with respect to operational safety 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 reasonably effective so that satisfactory performance with respect to operational safety 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 appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety is being achieved.

The SALP Board also assessed each functional area to compare the licensee's performance during the last quarter of the assessment period to that during the entire period in order to determine the recent trend for each functional area. The trend categories used by the SALP Board are as follows:

Improving: Licensee performance has generally improved over the last quarter of the current SALP assessment period.

Consistent: Licensee performance has remained essentially constant over the last quarter of the current SALP assessment period.

Declining: Licensee performance has generally declined over the last quarter of the current SALP assessment period.

III. SUMMARY OF RESULTS

A. Facility Performance

	FUNCTIONAL AREA	CATEGORY LAST PERIOD*	CATEGORY THIS PERIOD**	RECENT TREND
1.	Plant Operations	2	3	Consistent
2.	Radiological Controls	3	3	Improving
3.	Maintenance & Modifications	1	2	Consistent
4.	Surveillance	1	2	Consistent
5.	Emergency Preparedness	3	3	Consistent
6.	Security & Safeguards	2	2	Consistent
7.	Refueling/Outage Activities	1	1	No Basis
8.	Licensing Activities	1	1	Consistent

* July 1, 1983 to September 30, 1984
** October 1, 1984 to October 31, 1985

B. Overall Facility Evaluation

Recovery from the recirculation piping replacement outage was conducted in a slow, cautious manner with active involvement of both onsite and corporate management. The outage highlighted the licensee's commitment to upgrade plant hardware. Replacement of the piping also resulted in an extensive plant decontamination program. Similarly, upgrading of plant hardware to satisfy NRC regulations regarding environmental qualification was noteworthy. When considering each of the functional areas assessed, the licensee's commitments to a plant betterment program is evident. Notwithstanding the clear evidence in hardware improvements, there are symptoms which are indicative of problems associated with personnel staffing and supervisory/management oversight. These are discussed below.

One of the significant outcomes noted during the SALP Board deliberations was the recurrent issue of staffing. In the areas of operations, security, maintenance and radiological controls, the adequacy of staffing supervisory, professional and crafts positions was noted to be weak. In a similar vein, the oversight of BECo supervisors of work in progress by either BECo staff or contractors was noted to be insufficient. Whether this is due to a lack of supervisors or lack of a policy to foster such work habits by supervisors is not clear. However, review of the enforcement history (Table 5) clearly highlights a number of recurring problems attributable to either poor procedural

adherence, poor administrative practices or failure on the part of managers and supervisors to ensure proper planning, scheduling and performance of required tests or maintenance. Similarly, a review of plant shutdowns (Table 7) shows that some of the four automatic scrams and five plant shutdowns can be attributed to similar causes.

Another observation relates to the lack of critical self-assessment. During the assessment period, significant NRC interaction was required to identify problems and subsequently to get appropriate corrective action. In some cases, corrective actions tended to be superficial in that they addressed only the symptoms but not the underlying reason for the problem. A complicating factor in this regard is the management attitude toward perceived weaknesses; a defensive posture is frequently taken with respect to NRC as well as licensee self-identified weaknesses. This defensive posture inhibits a thorough and critical evaluation with subsequent delays in resolving the problem(s). Consequently, problems tend to linger for long periods until drastic measures are taken. The radiological improvement program is an example of a drastic corrective measure. In response to an NRC order, BECo is developing a framework for improved performance, but nonetheless, NRC oversight and action are still required to assure proper development and implementation. For example, the licensee repeatedly failed to correct a problem identified by the licensee's independent radiological assessor until the NRC staff took action. Similar problems have been observed in the emergency planning program; the self-critique of the annual exercise was not thorough, the commitment to adequate emergency facilities required NRC action, and lack of personnel continues to hinder program improvements. Another lingering problem is the adequacy of licensed operator staffing.

In summary, there has been an improvement in plant hardware over the last several years. However, the SALP results indicate that further improvements are not readily achievable until the staffing/personnel situation is resolved. This, in our view, can be accomplished by a more aggressive posture and followup by management to ensure better training, procedural adherence, planning and supervision of work.

Training

There are no training programs at Pilgrim that have been accredited by INPO during the appraisal period. Over the year, there has been a continuing improvement in the number of senior reactor operators but this has resulted in shortage of reactor operators which now is becoming acute. There were two NRC-administered exams during the appraisal period. In December 1984, 4 of 7 SRO candidates were licensed, 2 of 3 RO candidates were licensed. The 3 SRO and 1 RO failures were retested in May 1985 with satisfactory results. This experience indicates that (1) the number of RO candidates taking the exam is very low and (2) the SRO training program was deficient as evidenced by the failure rate. The licensee has managed to overcome SRO shortages; unfortunately, this was at the expense of ROs. The licensee's screening and/or training program for ROs is not effective in resolving this long standing problem. Consequently, operator overtime has been relied on to continue

operations and there is less flexibility to place experienced staff in support organizations. During the next appraisal period, NRC audit of the licensed operators' requalification program will provide further insights into training effectiveness. Training of the non-licensed staff has not been specifically inspected; INPO accreditation should assure that programs are in place. Subsequent NRC inspections will focus on effectiveness as evidenced by operator/worker practices in the plant. Based on the performance results noted in this SALP, there may be a need for additional training for first line supervisors to properly manage and oversee activities. Such efforts are an effective means of assuring adherence to procedures, minimizing personnel errors, and identifying design weaknesses.

Quality Assurance

The assurance of quality is a responsibility of every individual at the plant. One of the mechanisms available to managers is the use of a quality assurance/control program to monitor work in progress and to audit programs. QA/QC personnel were actively involved in reviewing plant operations during the assessment period. However, there was a lack of timeliness of plant managers and staff to correct problems identified in the QA/QC findings. This lack of responsiveness indicates that management is not taking full advantage of the QA/QC program. It is not obvious whether this is a result of poor attitudes or insufficient resources; however, it does require senior management attention to resolve the problem.

IV. PERFORMANCE ANALYSIS

A. Plant Operations (1100 hours, 29%)

1. Analysis

During the previous assessment period, problems were identified in the areas of safety system valve position monitoring, independent verification of safety system conditions, uncorrected Quality Assurance (QA) findings, and licensed operator staffing.

No subsequent valve position concerns were identified during the current assessment period, indicating that licensee corrective actions were adequate. Additional NRC effort was required to obtain an acceptable corrective action for the uncorrected QA findings (termed by the licensee "Operational Surveillance" findings). Additional NRC effort was also required to resolve the independent verification concern. The operator staffing problem became more acute during the current assessment period and is discussed below.

The operators conducted routine power reductions largely without incident, demonstrating their ability to handle the plant in a professional manner. Control room atmosphere was generally quiet with nonessential business diverted to an administrative annex. Approaches to safety issues were conservative and no significant problems were identified. Weaknesses were identified in the areas of licensed operator staffing, corrective actions, and occasional lapses in operator attention to detail.

A chronic shortage of licensed reactor operators grew worse during the assessment period due to promotions, job transfers, and the death of one individual. At the end of the assessment period, only nine reactor operators and one senior operator (functioning as a reactor operator) were staffing five operating shifts. To compensate for the shortage, operators routinely exceeded the overtime guidelines in NRC Generic Letter 82-12. Senior licensee management did not become aware of the full extent of operator overtime until after one individual's time card indicated that he worked 97 hours in a seven day period. A continuing weakness in the overtime approval process caused operators to repeatedly (thirty-five instances) exceed overtime guidelines without station management's prior knowledge or approval. NRC concern about the implementation of the overtime guidelines was discussed with the licensee in early 1985. The need for additional NRC action in this area demonstrates inadequate long range planning and staffing, weaknesses in policy implementation, and lack of effective corrective action for a recurring problem.

The lack of a sufficient number of licensed operators has been a repeated NRC concern over the past four years. This concern was discussed in the 1983 SALP report and highlighted in the 1984 SALP

report. Despite these concerns, senior licensee management did not act to ensure that an adequate number of individuals with appropriate backgrounds/capabilities entered the reactor operator training program pipeline. Finally, in the latter part of this assessment period, the licensee recognized that the operator shortage problems would require a substantial manpower commitment to resolve. As a result, ten new staff positions for licensed reactor operators were added to the Operations Department. Unfortunately, the effect of this staffing increase will not be realized until the licensing process is complete in 1987. If additional attrition takes place or if the current candidates do not pass the next scheduled NRC license examination in May 1986, the operator shortage could continue into 1987 or beyond. Continued management attention to recruiting, training, and retaining licensed reactor operators is imperative to prevent the current operator shortage from becoming more acute.

The licensee instituted six shifts of senior reactor operators during the assessment period, demonstrating improvement in this area. However, the licensed operator shortage may require the diversion of some SRO's to operator positions, decreasing the SRO shifts to five.

Improvement in the operations program such as reorganizing valve lineup procedures, valve tagging, and the development of operations-oriented system drawings were planned by the licensee, but not implemented during the assessment period due to support staff limitations. While the licensee previously increased clerical assistance in the Operations Department to help with routine activities, professional-level support remains minimal. The lack of professional support coupled with the shortage of licensed personnel (available for collateral duties) has severely hampered operational program initiatives.

The quality of the licensee's operator training program was judged acceptable, with seven senior reactor operators and three reactor operators licensed during the assessment period. Three of the senior operators and one operator failed portions of their initial written examinations, but successfully passed subsequent makeup exams. The material sent to Region I for preparation of the original and makeup operator examinations was of poor quality and did not identify all current plant modifications or procedure changes. New operator and senior operator training lesson plans are being developed in accordance with INPO performance elements. The new lesson plans should improve training program effectiveness. The licensee should expedite this development and finalize the lesson plans prior to the next scheduled examination in May 1986. Construction of a simulator is continuing and should be completed by late 1986 or early 1987.

Lapses in operator attention to detail involved the use of nuclear instrumentation during refueling operations (bypassing one SRM and not continuously monitoring another SRM), the assessment of drifting reactor protection system instrumentation (main steam line radiation monitors), and an inadvertent reactor scram from low power due to inadequate reactor water level control. Additional operator attention could have prevented the loss of secondary containment integrity while the plant was at power. Circumstantial evidence indicates that increased operator attention might have prevented refueling equipment from being damaged during fuel movement at the end of the assessment period.

While the licensee's response to NRC initiatives was generally adequate, considerable NRC effort was required to resolve control room manning issues and to ensure that adequate corrective actions were taken following the discovery of refueling equipment damage. The response to these issues, which involved handling of personnel, contrasted to the licensee's usual approach to safety issues involving hardware. Hardware issues were typically approached in a manner which stressed safety. For example, the licensee set the main steam line high radiation monitor trip points to conservative values between test runs during hydrogen injection experiments, beyond technical specification requirements. Licensee management actions on personnel related issues as well as the failure to anticipate the shortage in licensed reactor operators indicates inadequate management sensitivity to the effect of personnel decisions on plant operations.

A detailed evaluation of LER quality using a sample of 10 LERs issued during the assessment period was made using a refinement of the basic methodology presented in NUREG/CR-4178. In general, they found these LERs to be of acceptable quality based on the requirements contained in 10 CFR 50.73. There were nine LERs submitted for this functional area; they were for a variety of causes. There were no adverse trends noted. A generally conservative approach is taken in reporting under 10 CFR 50.73.

The 1984 SALP report expressed a concern about the large amount of time spend by licensee managers in safety committee duties. The licensee has taken steps to reduce the impact of the onsite Operations Review Committee (ORC) by changing ORC membership and reducing the review workload. The plant manager no longer chairs ORC meetings, but continues to review and approve ORC recommendations. ORC workload will be decreased by identifying station procedures that do not need ORC approval. These efforts are important and should continue.

Licensee QA audit activities associated with operations were generally adequate during the assessment period, demonstrating a continuing commitment in this area. QA staffing was maintained with few

vacancies. However, licensee management was sometimes slow in responding to QA surveillance and audit findings. This lack of responsiveness indicates that management is not taking full advantage of the quality assurance program. Senior licensee management has not ensured that management support for the QA process is evident and that plant personnel have the appropriate attitudes and resources to effectively respond to QA findings, maximizing the usefulness of the QA program.

In summary, lack of effective management action on licensed operator staffing has permitted the number of licensed operators to drop to minimally acceptable levels. If the shortage worsens, plant operations may be disrupted. The staffing problems combined with a lack of alternative operational program support has delayed action on several operational improvement items. These items could improve operator efficiency and reduce the chance of safety-significant operator errors. Lack of operational support may have weakened the plant staff's attitude towards the QA program, also slowing the resolution of QA findings. Although plant performance during the assessment period was acceptable, the board believes that these problems are significant and that future plant performance and safety may be degraded without senior management action to strengthen this functional area. No significant weaknesses were identified in the licensed operator training program.

2. Conclusion

Rating: Category 3.

Trend: Consistent.

The performance rating in this category is not intended to imply concern about individual operator performance. The rating is primarily a reflection of inadequate senior management response to personnel related matters such as licensed operator staffing, operations department support, and control room manning.

3. Board Recommendation:

Licensee:

-- Develop contingency and long term staffing plans for licensed operators.

-- Assess the adequacy of Operations Department staffing and support including: licensed personnel, support staff, and training staff.

-- Assess the adequacy of management information systems for mid-level managers that could preclude problems such as unauthorized operator overtime.

NRC:

-- Closely monitor status of licensed operator training program.

-- Arrange for a corporate management meeting which includes senior licensee corporate management, upper Region I management, and representatives of the NRC program offices to discuss operations staffing problems.

B. Radiological Controls (513 hours, 14%)

1. Analysis

During the previous assessment period, weaknesses were noted in the evaluation of radiological incidents, ALARA program, description of personnel authorities and responsibilities, technician retraining program, alpha radioactivity monitoring program, and radioactive waste transportation program. A Category 3 rating was assigned. Improvements have been noted in these areas during the current assessment period due to an extensive Radiological Improvement Program (RIP) instituted in 1985.

There were seven inspections conducted by radiation specialists this assessment period and periodic coverage by the resident inspectors. Areas examined included: radiation protection; radioactive waste management and transportation; effluent controls and monitoring; chemistry; and radiochemistry. There were three special inspections: two to review circumstances, licensee evaluation and corrective actions for unplanned personnel exposures; and an inspection of the licensee's implementation of NUREG-0737 post-accident sampling, analysis, and monitoring requirements. An Order Modifying License was issued in November 1984 for correction of problems associated with an August 1984 unplanned personnel exposure during control rod drive work. An Enforcement Conference was held in January 1985 to discuss problems associated with a December 1984 unplanned personnel exposure during sludge lancing.

2. Radiation Protection

The licensee continued to experience problems in the area of self identification of problems and initiation of prompt, comprehensive corrective actions to resolve identified problems and prevent recurrence. The deficiencies appear to be associated primarily with the licensee's oversight of contractor activities. Examples are:

-- In December 1984, a contractor employee made an unauthorized entry to a tank to perform sludge lancing. The licensee's oversight of this high radiation area work was less than adequate in that: established high radiation area controls were not implemented, appropriate additional procedures were not established, nor was supervisory oversight of this activity effective. A Health Physics supervisor eliminated established high radiation area controls and failed to revise a radiation work permit accordingly. This problem existed for several days prior to NRC identification. Effective licensee corrective actions were implemented in response to this incident after NRC concerns were identified.

-- A second example involved the licensee's oversight of spent fuel pool work. NRC review of contractor cutting of highly radioactive components (e.g. control rod blades) found that: unapproved contractor procedures were being used for the activity; discrepancies existed between unapproved contractor and licensee approved procedures for the work; and personnel were not trained or qualified in all appropriate procedures. Similar problems were identified during licensee and NRC review of two unplanned personnel exposures sustained by contractors during control rod drive work last assessment period. The licensee's corrective actions for fuel pool work were "job specific" and not comprehensive. As a result, additional NRC effort was needed to obtain an acceptable resolution of problems associated with this work.

-- A third example involved failure to correct high radiation area surveillance deficiencies. The problem involved failure to clearly specify the Technical Specification required high radiation area surveillance frequency on radiation work permits. This problem was brought to the licensee's attention on a number of occasions. The licensee's final corrective actions have not yet been received and reviewed by NRC.

Due to the number and nature of problems identified in the radiological controls area last assessment period, an Order Modifying License was issued. This Order required that a comprehensive review of the radiological controls program be performed by the licensee and that the findings of this review be addressed by a Radiological Improvement Program (RIP). NRC monitoring of Order implementation found that the licensee performed an indepth review of the radiological controls and established a RIP to address deficiencies. The RIP, as established, addresses fourteen major areas of the radiological controls program and includes in excess of 200 committed primary action items. Although licensee senior management is closely monitoring status and progress of the action items, implementation and effectiveness are not closely monitored. Although no major problems were identified by the NRC in licensee implementation of the Order, problems were noted with the RIP failure to address high radiation area access key controls and some failures to generate acceptable procedures to meet RIP commitments. Work is still ongoing with the most corrective actions scheduled to be implemented by December 1985. The licensee has considerable work yet to do in the area of ALARA Program establishment; procedures; management oversight; and corrective action system. The actions taken to date are indicative of senior management's effort to improve the radiological controls program at Pilgrim.

At the end of the assessment period, the licensee was actively recruiting to fill a number of vacancies. These included a chief radiological supervisor and the chief chemical engineer. The lic-

ensee was using a large number (about one licensee to four contractors) of contractor radiation protection technicians to implement radiological controls. Some problems were identified with contractor technician efforts involving inadequate oversight of radiological work on a monitor tank.

Findings of radiological occurrence reports (ROR) were not always handled in a timely, comprehensive manner. Corrective actions for ROR findings were sometimes late and superficial. These problems were apparent in the areas of radiation protection procedure adherence and high radiation area key control. Repeat problems continue to be identified by the licensee's Radiological Assessors. In one case, NRC action was required to ensure that recurring problems identified by the Radiological Assessor were corrected. The lack of timely corrective action indicates that mid-level management is either not prioritizing work effectively or does not have sufficient resources to respond to problems. The licensee is currently revising the radiological occurrence report procedure to address these problems and ensure action is taken to prevent recurrence. The licensee has implemented temporary measures to address this problem pending procedure revisions.

Occupational radiation exposures at Pilgrim continue high, 4,082 person-rem in 1984, due partly to a high radioactive source term in the plant. No major problems with the ALARA program were identified during the assessment period, but the high levels of radiation in the plant makes ALARA practices particularly important at Pilgram.

During the current assessment period, the licensee conducted an extensive decontamination program for large areas of the process buildings. This cleanup effort significantly improved the access to safety equipment and should continue. However, recontamination of the clean areas is an ongoing problem. The licensee was developing a long term program to address the recontamination problem at the end of the assessment period. More containments of water leaks are being used than in the past, but uncontained leaks of potentially radioactive water are still noted in the quadrant rooms of the reactor building. Continued management attention will be required to develop a program that will prevent plant conditions from degrading (as a minimum) and to continue to reduce area contamination levels. As long as ALARA practices are employed during decontamination activities, the benefits of better access to plant equipment should outweigh the radiation exposure costs of decontamination.

The radiation protection technician training program has been significantly upgraded, in response to RIP commitments. Training for radiation protection supervisors and contractor technicians has also been upgraded. These program now contain defined objectives and

training outlines and appear effective. The retraining program for technicians is not well developed. General employee training is aggressive.

3. Radioactive Waste Management and Transportation

In response to the previously discussed Order Modifying License, the licensee performed a comprehensive review of the radioactive waste management and transportation areas. Minor deficiencies identified have been included in the licensee's Radiological Improvement Program. NRC review found that program improvements have been implemented on schedule. Improvements have been made in the areas of establishment of Program Policies; consolidation of radioactive waste storage areas; designation of approved storage location; and shielding and isolation of waste. In an effort to upgrade the quality of the radioactive waste shipping procedures, the licensee is currently reviewing and revising them. These actions by the licensee should enhance the quality of his radioactive Waste Management and Transportation Program.

Overall, no significant problems were identified in this area. The licensee has been implementing a generally effective radioactive waste management and transportation program.

4. Chemistry/Radiochemistry and Effluent Monitoring and Controls

The licensee was found to have an effective chemistry/radiochemistry and effluent monitoring and control program. As part of the reorganization initiated as a result of the Radiological Improvement Program, the licensee has reorganized the chemistry group and has created and filled additional positions. Staffing was found to be adequate. Technician knowledge and understanding of procedures was apparent.

As part of the routine inspection program the licensee was requested to analyze split samples and pre-prepared samples (both radioactive and non-radioactive). Licensee technicians performed acceptable analysis of samples provided thereby demonstrating licensee capability to perform satisfactory analysis of effluents.

The licensee experienced a number of unplanned releases this assessment period. Two involved releases of liquid and gaseous effluents from a machine shop. A portion of a normally "clean" machine shop was converted to a hot machine shop without the benefit of an adequate review of the potential for unmonitored, uncontrolled release from the hot shop. In one event, liquid radioactive material was introduced into normally clean station sewage. In another event, the normal ventilation system in the shop released unmonitored contaminated air to the environment. Although the situation was licensee identified, the licensee failed to perform adequate

reviews of normally uncontaminated systems in accordance with IE Bulletin 80-10. Such reviews were to be performed to prevent and readily detect situations similar to the one which occurred. The third release involved malfunction of sewage pumping equipment which led to an inadvertent overflow of sewage to storm drains. It was quickly repaired by the licensee. No apparent release in excess of allowable limits occurred during the three releases.

A special inspection of the licensee's post accident sampling, analysis, and monitoring capabilities relative to NUREG-0737 requirements found that the licensee met the requirements specified in the NUREG with few exceptions. This reflected good coordination between the engineering groups and the site. Some procedural deficiencies and a deviation involving a failure to install protective conduit on the drywell high range monitor detector cables were identified. Training of technicians on the operation of the post accident primary coolant and containment atmosphere sampling system was commendable as evidenced by demonstrated performance capabilities.

5. Summary

In summary, the licensee continues to experience problems in the area of oversight of radiological work and self identification and resolution of problems to prevent their recurrence. Despite ongoing program improvements under the RIP, these problems indicate that weaknesses were still present in the radiation protection program. Weaknesses in the identification and correction of problems indicates that upper management initiatives in this area are not fully understood by mid-level managers or that human resources may not be sufficient. Program improvements being made to satisfy RIP commitments should considerably improve the overall quality of the program.

6. Conclusion

Rating: Category 3.

Trend: Improving.

7. Board Recommendations

Licensee:

-- Upgrade the process used to self identify radiological problems to ensure timely resolution and prevent their recurrence. Maintain independent reviews of the radiation protection program.

-- Continue to vigorously implement initiatives and/or recommendation contained in the Radiological Improvement Program.

-- Fill identified vacancies and minimize reliance on contractor personnel providing oversight of radiological work.

NRC:

Maintain increased inspection effort in this area. Hold a management meeting with the licensee to review the status and effectiveness of the Radiological Improvement Program.

C. Maintenance and Modificatic s (820 hours, 22%)

1. Analysis

During the last assessment period, a lack of procedural guidance for electrical bus transfers was identified as a weakness. The licensee plans to address this concern prior to the next refueling outage. This action is considered timely. The SALP board also recommended that the licensee continue initiatives in maintenance trending and tracking. While no significant additional actions have been taken in this area, no recurring maintenance problems were identified that indicate weakness in the licensee's trending program.

During the current SALP period, specialist inspections reviewed previous inspection findings and water hammer events that occurred in the high pressure coolant injection (HPCI) system. No significant problems were identified during these reviews or during routine resident inspections of this functional area.

Licensee approaches to maintenance and modifications were generally thorough and continued to emphasize the identification of root causes to problems. Despite weaknesses in the areas of vendor interactions and preventive maintenance, the overall performance in this functional area was considered strong.

Good control was demonstrated over extensive online plant modifications which have been conducted with the reactor at power. With the exception of one security problem (See section G), significant plant modifications have been installed without incident during the current operating cycle.

A review of the licensee vendor interface program identified several weaknesses. The licensee program did not systematically address correspondence from vendors other than General Electric. Additional problems involving the scope of reviews of vendor information, the timeliness of the reviews, and the documentation of the reviews were identified. However, no significant equipment deficiencies were identified resulting from these program weaknesses.

Licensee corrective actions for maintenance findings were typically comprehensive and timely. Licensee actions to correct recurring problems appeared generally effective. Two isolated instances of untimely corrective action were identified during this period. In one case, the licensee did not plan to complete corrective action to prevent the defeat of safety systems during component isolations until 1995. Additional NRC effort was required to obtain timely action in this case. The licensee has also been slow to repair the backup 125V and 250V station battery chargers. These chargers have been out of service since the 1984 outage. This could be a problem if battery charger reliability degrades. The backup chargers are

not required to be operable by the technical specifications. The licensee occasionally has been slow to repair equipment that was not required to be operable by the technical specifications, e.g., post accident monitoring equipment. The lack of timely response to out of service safety equipment (not covered by technical specifications) may indicate a weakness in scheduling second and third priority maintenance.

Corporate management was actively involved in site activities. A site representative of the corporate engineering department helped coordinate engineering input to the site and minimized interface problems. One interface problem between the corporate staff and the site was identified. Contractors reporting to offsite licensee engineers improperly installed a test instrument on the high pressure coolant injection (HPCI) system, which made the system inoperable. The improper installation was found after the HPCI system failed a subsequent routine surveillance test. The licensee took prompt corrective action after the problem was identified.

Corporate management was actively involved in the assessment of HPCI water hammer events. The engineering approaches used to evaluate and correct the water hammer problem were judged to be conservative and effective. In contrast, previous licensee responses to water hammers in the HPCI steam exhaust line were limited in scope and were not consistent with documented vendor recommendations.

At the end of the assessment period, the licensee brought maintenance and modification groups together under a newly created management position the Maintenance Section Head. This action should help coordinate station activities and provide additional management oversight for the groups. The Chief Maintenance Engineer was appointed to the Section Head position, creating a significant vacancy in the maintenance department.

The licensee also strengthened the maintenance program by adding three maintenance planner staff positions. These individuals are responsible for planning maintenance activities and coordinating maintenance logistics in the plant. First line maintenance supervisors will be freed of these duties and should be able to spend more time in the plant directly supervising work.

The backlog of outstanding maintenance requests has been reduced since the end of the last outage demonstrating licensee initiative. Maintenance management tracks the open maintenance requests and actively seeks to reduce the second and third priority maintenance items. However, ongoing environmental qualification modifications to plant equipment have impacted Maintenance Department priorities, hampering efforts to reduce the backlog. The licensee has recognized a staffing weakness and is considering enlarging the maintenance staff, in part due to additional plant modifications scheduled during the coming years. This demonstrates licensee initiative in anticipating future maintenance staffing needs.

The licensee's commitment to establishing a comprehensive preventive maintenance program was evident, although plant modification work has prevented the completion of some routine maintenance. Minor administrative weaknesses in the preventive maintenance program were identified during the assessment period. Preventive maintenance scheduled for the next refueling outage for valve motor operators has not been proceduralized. Also, preventive maintenance for the emergency diesel generators which is currently supervised by a contractor had not been proceduralized. The licensee plans to formalize both programs during 1986. A weakness in the computer-based scheduling system for preventive maintenance was identified at the end of the assessment period. Continued licensee efforts are needed to ensure that the preventive maintenance program is adequately documented and implemented.

Maintenance worker training appeared adequate to support station activities with few errors. The maintenance training program is being formalized in preparation for INPO accreditation, with program submittal expected by the beginning of 1986. Special training courses for maintenance staff included valve and motor operator training, fundamentals of pressure and temperature, and environmental qualification training.

2. Conclusion

Rating: Category 2.

Trend: Consistent.

3. Recommendations

None.

D. Surveillance (646 hours, 17%)

1. Analysis

The previous assessment period did not identify major deficiencies in the surveillance program However, few surveillance tests were observed because a major outage coincided with the assessment period.

During the current assessment period, three specialist inspections were conducted in the areas of containment leak rate testing and startup physics testing. Post modification testing was reviewed during a special team inspection prior to startup from the 1984 outage. Routine resident reviews of surveillance testing were also conducted.

Procedures for containment leakage testing were clearly written and technically accurate. All phases of test activities, especially access to the reactor building, were well controlled by the Test Coordinator. Initiation of leak searches during temperature stabilization were prudent and timely. Water leakage discovered during the test was well controlled. QA/QC coverage of containment leakage testing activities was appropriately planned, technically useful, comprehensive, and well documented.

During power operation, performance was mixed. Strength was demonstrated by the successful completion of an unusually large number of compensatory surveillance tests required by ongoing environmental qualification modifications to plant safety equipment. The licensee's approach to surveillance testing demonstrated a consistent concern for safety, particularly in the area of secondary containment damper testing. However, weaknesses in the areas of startup test scheduling, test adequacy, compliance with procedural requirements, and response to abnormal test results were also observed.

The licensee conducted a slow startup from the 1984 pipe replacement outage to provide time for extensive startup testing. While the startup test program demonstrated an organized approach to the startup, eight surveillance tests required by the technical specifications were not conducted in a timely manner. The tests were missed due to scheduling omissions and procedural deficiencies. The scheduling omissions indicate a weakness in the licensee's computer scheduling system, the Master Surveillance Tracking Program (MSTP). While normally adequate to ensure that surveillance tests are conducted in a timely manner, the MSTP was not able to adequately schedule tests during a prolonged startup.

The procedural deficiencies involved the failure to completely test some safety system components. Deficiencies were identified in testing neutron instrumentation and certain other reactor protection system instrumentation. An additional example of an incomplete

surveillance test procedure was reported in LER No. 85-26. The licensee's staff had difficulty in some cases determining which one of several overlapping test procedures fulfilled regulatory requirements. These problems indicate that additional effort should be made to verify the technical adequacy of surveillance test procedures.

Another problem with the startup tests involved the timeliness of followup to quality assurance (QA) audit findings. A QA finding identified two surveillance tests that did not meet technical specification requirements two months prior to the startup from the 1984 outage. The licensee did not resolve the finding until after the startup, which was within QA program timeliness guidelines but which demonstrated a lack of sensitivity to the finding. Subsequent NRC action could have been avoided if the finding was resolved prior to startup. Additional licensee attention should be given to ensuring that QA findings that involve regulatory concerns are resolved in a timely manner.

Licensee personnel generally conducted surveillance tests in a complete and timely manner. However, deficiencies were identified during the assessment period which involved a lack of attention to detail. In one case, operators failed to correct known deficiencies in a station battery surveillance test procedure, which subsequently caused a technical specification surveillance test to be missed. Lack of attention to detail was also evident in the inadvertent return to service of an uncalibrated local power range neutron monitor during surveillance tests. Arithmetic errors were noted in several salt service water system surveillance tests and a computer program error was identified which falsely lowered vacuum breaker leak rate results by a factor of sixty. Licensee corrective actions were prompt in each case, and no problems of this type were identified during the latter portion of the assessment period.

The licensee did not always react promptly to abnormal surveillance test findings. The lack of action was usually related to delays in reporting abnormal results to the control room via the licensee's Failure and Malfunction Reporting system (F&MR). Delays in submitting F&MR's to the control room caused secondary containment integrity to be lost for a day while the reactor was at power and caused a delay in conducting compensatory surveillance tests for an inoperable emergency diesel generator. A delay in submitting an F&MR on abnormal inservice inspection results for safety system pipe hangers delayed the licensee's response to those test results. Technical evaluations of abnormal surveillance test results were generally thorough and demonstrated an adequate regard to safety. Concern for safety was particularly evident when the licensee increased the frequency of secondary containment damper inspections after finding failed dampers during routine surveillance. However, in one case, considerable NRC effort was needed to resolve abnormal

surveillance test results. In this case, the safety implications of drifting main steam line radiation monitors were not recognized by the licensee. In addition, the licensee was slow to correct a potential weakness in the surveillance test program involving the uncontrolled removal of safety related instruments from service for calibration and testing.

The inservice test (IST) program was not fully implemented during the assessment period. The deviations from the program submitted to the NRC were minor, but indicated a need for additional attention to the program.

A new halon fire suppression system for the cable spreading room had not been declared operational at the end of the assessment period because of the lack of a surveillance test for several months. Continued management effort should be directed to placing this system in operation.

In summary, performance in this functional area was mixed, with strength noted in the conduct of compensatory surveillance testing for inoperable equipment and in the conduct of the 1984 primary containment integrated leakage test. However, weaknesses were noted in the response to abnormal surveillance test results, in surveillance test procedural adequacy, and in startup test scheduling. Responses to NRC and QA findings in this area were sometimes slow. Personnel performance errors contributed to most of these weaknesses. Additional emphasis on attention to detail would improve test timeliness and help minimize problems in this functional area.

2. Conclusion

Rating: Category 2.

Trend: Consistent.

3. Board Recommendation

Licensee:

-- Develop better control of startup surveillance testing to ensure better timeliness and adequacy.

-- Assure that measures exist to provide for prompt evaluation of abnormal test results and followup actions (if necessary).

NRC

None.

E. Emergency Preparedness (310 hours, 8%)

1. Analysis

During the previous assessment period the licensee was rated as Category 3 in Emergency Preparedness, due principally to observations made during the August 1984 exercise. Weaknesses were identified in the preparation and planning for the exercise and in command and control in the Emergency Operations Facility (EOF). Based on the performance during this exercise, a remedial drill was held in October 1984, to reassess the licensee's dose assessment capabilities and decision making process.

During this assessment interval, the remedial drill was observed, a routine EP follow-up inspection was performed, and the September 1985 exercise was observed. The remedial drill demonstrated improvements in the areas of dose assessment and decision making, which had been identified as weaknesses during the August 1984 exercise.

During the December routine inspection, two problems were identified concerning implementation of provisions of the Emergency Plan. (Failure to mail information brochures to the general public and failure to perform an annual update to the Emergency Plan and procedures). During the review of the scenario package submitted for the 1985 exercise, it became apparent that the scenario package did not contain sufficient detail. It was recommended the the exercise be postponed in order to take time to clarify and complete the exercise scenario. The licensee agreed to delay the exercise from August 1 to September 5, 1985 to make the necessary improvements to the scenario package.

During the exercise, two significant areas of concern were identified by the NRC. The first involved a lack of evaluation or control of radiation exposure for re-entry teams sent into the plant for various tasks. Serious overexposures would very likely have resulted from the actions taken if this had been an actual situation. The second concern involved the fact that there were no procedures in effect for relocation of the EOF to the alternate location, in spite of the fact that the trailers which presently function as the EOF are positioned near the stack with no shielding or ventilation filtering. Improvements were evident over the 1984 exercise, however, a remedial drill was required to demonstrate the ability to evaluate and control radiation exposures of re-entry team personnel. The licensee has indicated that plans for construction of an off-site EOF are nearing completion, which will help solve some of the concerns relating to the facility.

In summary, some improvements in emergency facilities and in the annual emergency exercise were noted during the assessment period. However, performance was only minimally acceptable in this func-

tional area for the second year in a row. Portions of the annual exercise were unsatisfactory and had to be demonstrated in a supplementary drill. The lack of thorough exercise critique was a recurring problem. Personnel errors were evident during the exercise and may reflect weaknesses in program staffing and training.

2. Conclusion

Rating: Category 3.

Trend: Consistent.

3. Board Recommendation

Licensee:

-- Promptly implement plans for construction of off-site EOF.

-- Assess staff resource commitments for this area to assure that it receives adequate attention between exercises and drills.

F. Security and Safeguards (100 hours, 3%)

1. Analysis

During the previous assessment period, weaknesses in the licensee's oversight of the contractor security force were noted. No further problems in this area were identified during the current period, indicating that licensee supervision of the contractor guard force has improved. The previous SALP report also identified a weakness in reporting security events to the NRC. Nine security event reports were reported to the NRC during this assessment period demonstrating an improvement in the reporting program.

During the current assessment period, one routine unannounced physical security inspection and one special inspection were performed by region-based inspectors. Routine resident inspections continued throughout the period. One severity level III violation, for which a civil penalty was proposed, was identified as a result of the special inspection.

Licensee corrective actions for reportable events were sometimes weak. For example, six events were reported this year which involved the failure to promptly compensate for security equipment failures. The recurring problem demonstrates both a staffing deficienciy and a lack of effective corrective action. Additional security program weaknesses were apparent during a review of openings in a security vital area barrier. These weaknesses included inadequate control over contractor construction activities adjacent to the barrier, an incomplete licensee evaluation of the barrier, and the use of material to repair a barrier opening that did not meet requirements. Previous licensee evaluations of barrier integrity were conducted in 1982 and were inadequate. Considerable NRC attention, including escalated enforcement action, was required to obtain comprehensive corrective action. In both instances, the licensee failed to establish guidelines to implement security objectives. In the first case, the licensee did not establish criteria for timeliness of compensatory actions. In the second case, no guidelines were established for judging acceptable site openings in security barriers. Licensee management should be more aggressive in establishing guidelines and clarifying security program objectives.

Staffing of the program by the licensee and the security contractor appears adequate with the possible exception of shift manning. Shift manning was increased at the end of the assessment period to ensure that timely compensatory action is taken for security system equipment failures. The security contractor also increased shift supervision by adding a second supervisor to each shift. The second shift supervisor provides the capability for patrolling the site

to assess personnel performance and the general status of security features. The security contractor provided several formal management training seminars to supervisory personnel during the assessment period. The security contractor also engaged a consultant to review its overall training program. These actions have apparently been effective as evidenced by improved morale and a significant reduction in security force personnel errors during this assessment period.

Maintenance of security systems hardware and software received considerable management attention during this assessment period. The licensee has assigned two dedicated instrumentation and calibration technicians to maintaining the system and provided two software and two hardware computer technicians on 24 hour call.

The annual security program audit appeared to be more comprehensive in scope and detail than previous audits. In contrast to previous years, the audit teams included a consultant with nuclear power plant security expertise. Previous audits were largely compliance oriented. Additional program effectiveness could be achieved by reviewing the security plan, procedures, and systems and by focusing on NRC security objectives during the audits. The security program was included in monthly QA surveillances. Monthly backshift inspections were being conducted by the security supervisor and/or a corporate security investigator who was assigned to the site during this period. The corporate security investigator provided management with another perspective on the effectiveness of the program and demonstrated management initiative.

In summary, weak corrective actions and a staffing deficiency were noted in this area. While improvements in contractor training and QA auditing were apparent, additional clarification of security objectives and emphasis on timely corrective action to meet these objectives is needed.

2. Conclusion

Rating: Category 2.

Trend: Consistent.

3. Board Recommendation

Licensee:

Clarify security program objectives and review causes for untimely corrective actions.

G. Refueling and Outage Management (303.5 hours, 8%)

1. Analysis

Strong outage management was evident during the previous assessment period for the conduct of the 1984 pipe replacement outage. Continued good performance was noted during the current assessment period. The pipe replacement outage ended during the first quarter of the assessment period on December 24, 1985. As a result, no last-quarter trend was noted for this functional area. Plant power was increased slowly over a period of several weeks, demonstrating a cautious approach to the startup and a concern for safety.

A team inspection at the start of the assessment period reviewed the readiness of the licensee for startup from the outage. No major program deficiencies were identified during the inspection. Strengths were noted in updating operator training, drawings, procedures, and technical specifications to reflect plant modifications. Weaknesses in the turnover of modifications from the construction to the preoperational test groups, verification of system configuration following preoperational testing, control over nonconforming material, and the lack of a station drawing for the air start system on the emergency diesel generators were noted. Licensee response to the inspection results was prompt and acceptable.

Numerous last minute changes were made to valve lineups for safety systems just prior to startup, in part due to the simultaneous close-out of many maintenance work packages. The last minute valve lineup verifications and changes were a significant burden on the plant management. No actual lineup problems were identified after these verifications indicating that, although rushed, they were successful. Additional planning in this area would minimize the impact of maintenance close-out reviews on the plant staff, contributing to more thorough reviews.

The startup test program in December 1984 was well controlled and well doucmented. Startup test procedures, including physics testing procedures were technically sound. The reactor engineering staff was judged knowledgeable and responded readily to NRC suggestions for improvements in the testing program. The QA staff conducted a post fuel load core verification and agreed to participate in startup physics tests.

A significant lack of housekeeping control was indicated by the presence of articles of protective clothing and masking tape in the main and test tanks of the standby liquid control system (SLCS) early in the assessment period. The debris likely fell into the tanks during the 1984 outage. A reactor shutdown in January 1985 was required while the SLCS system was flushed and the debris removed. The presence of loose items on the floor of the reactor

building (protective clothing, trash, and loose tools) is a continuing intermittent problem at the station. Management should increase the emphasis on housekeeping to help prevent SLCS type problems from recurring.

2. Conclusion

Rating: Category 1.

Trend: No basis.

3. Board Recommendations

None

H. Licensing Activities

1. Analysis

During the previous assessment period, the need to resolve inaccurate and inappropriate technical specifications was noted. Specification changes were subsequently submitted to NRR regarding plant organization, a reactor water level trip setting, and primary containment inerting makeup requirements. These changes demonstrate responsiveness to NRC concerns. However, continuing efforts are needed to clarify and correct the technical specifications. Licensee responses to concerns about technical specification clarity were slow during the current assessment period and are discussed below.

Throughout the rating period the utility's management has demonstrated a high level of interest in licensing matters by active participation in the important issues. An example of this was the participation by the Senior Vice President and other management in a briefing of NRR on BECo's efforts to environmentally qualify electrical equipment and the need for a schedular extension beyond March 31, 1985 for completion of this work. A senior executive signs all letters to the NRC, thus ensuring management involvement in licensing activities. The Senior Vice President-Nuclear frequently visits both the engineering offices and the plant site and the utility now has a vice-president in charge at each of these locations.

The licensee's submittals during this period have been more complete technically than some in the past, which reflected the additional attention being given to them by review committees and licensing personnel.

The licensee's management and staff have demonstrated a clear understanding of technical issues involving licensing actions. Submittals normally exhibited conservatism from a safety standpoint. On occasions when the licensee took the position that a modification would be of marginal benefit compared to its cost, it has provided a sound technical approach accompanied by credible analysis to support its position. This was the case with implementation of automatic switchover of RCIC suction to the suppression pool whenever the condensate storage tank level is low, as called for by NUREG-0737 Item II.K.3.22.

In order to develop acceptable resolutions to important technical issues, the licensee has frequently consulted the staff and this approach has proven beneficial to both parties. For example, in meetings with the staff concerning masonry walls, fire protection, environmental qualification of electrical equipment, and hydrogen addition to reactor coolant, the licensee provided clear presentations of proposed solutions to these issues.

BECo has had a Long Term Plan (integrated schedule) in effect since July 1984 which includes target dates for plant modifications required by NRC rules or orders (Schedule A) and other plant modifications, procedure revisions, or changes to staffing requirements (Schedule B) for which BECo has committed to implementation dates. With the exception of minor changes in several Schedule B items that were agreed to by NRR, BECo has met all such requirements and commitments during this assessment period, demonstrating management initiative in this area. However, meeting the December 31, 1986 date for completion of control room design modifications is in doubt since the licensee is overdue in establishing a date for submittal of a supplement to its Detailed Control Room Design Review Summary Report.

The licensee was prompt in responding to NRC requests for information or gave logical reasons for delay and establishes a new date. During this rating period, the licensee provided appropriate information which enabled NRR to conclude its review of several important issues. Among these were Radiological Environmental Technical Specifications, the Mark I Containment Program, Environmental Qualification of Electrical Equipment, the B-41 Appendix R Fire Protection Exemptions, Control of Heavy Loads over the Spent Fuel Pool, and Post Accident Sampling System (PASS) modifications. However, the submittals for several other issues (notably hydrogen recombiner capability and IST), which are in review, were very slow in forthcoming. The resolutions proposed have generally been acceptable, but several have required considerable NRC effort to resolve.

An area where responsiveness could be improved concerns clarifications and corrections of technical specifications. These could be proposed and handled more quickly if BECo's decision process were modified to simplify its review of administrative changes. Currently, even minor changes in technical specification wording require several months to prepare and submit to NRR. Current technical specification problems include vaguely worded action statements and incomplete definitions. In some cases, the licensee uses standard technical specification requirements to interpret vaguely worded station specifications. Also, the licensee could have shown more initiative in requesting changes regarding surveillance technical specifications that require additional testing (as compared to Standard Technical Specifications) when components are made inoperable. This change could have resulted in less equipment testing and wear when components were made inoperable during on-line EQ modification work.

The licensee maintained a large licensing staff to deal with NRC and other agency requirements. During this rating period, members of the licensing staff participated in simulator training, the Reactor Safety Course at MIT, and a course in licensing procedures.

In summary, there was consistent evidence of prior planning, management involvement, and thorough audits. Design work is generally timely and complete records are usually available. The licensee has generally proposed technically sound and conservative resolutions of the issues and these resolutions have been timely in most cases. Acceptable resolutions to NRC initiatives are generally proposed, but some responses have been slow in coming. Nevertheless, only a few long standing issues remain to be completed. The completion of a long term plan reflects good planning and a responsiveness to NRC initiatives in this area.

2. Conclusion

Rating: Category 1.

Trend: Consistent.

3. Board Recommendation

None.

V. SUPPORTING DATA AND SUMMARIES

A. Investigation and Allegation Review

No investigations were conducted during the assessment period.

Three allegations were received and reviewed. One was unsubstantiated. A second involved lack of control of core drilling in the reactor building floor. A citation was issued in connection with this concern. A third allegation involved health physics records. Documentation was subsequently modified to resolve this concern.

B. Escalated Enforcement Actions

1. Civil Penalties

A fifty thousand dollar civil penalty was proposed during the assessment period in connection with unidentified openings in a security vital area barrier. A special inspection by a regional specialist inspector identified weaknesses in control of contractor personnel, inspections of the barrier, and corrective actions.

2. Orders

An Order Modifying License was issued on November 29, 1984 in connection with recurring weaknesses in the radiation protection program. The order confirmed implementation of an extensive Radiological Improvement Program (RIP).

3. Confirmatory Action Letters

A Confirmatory Action Letter was issued on October 26, 1984 in connection with recurring radiation protection program weaknesses. The letter outlined licensee plans for evaluating and correcting these weaknesses.

C. Management Conferences

Enforcement conferences were held on November 20, 1984, January 31, 1985, and August 27, 1985 in the Region I office. Weaknesses in the control and monitoring of neutron instrumentation during refueling were discussed during the first conference. An unplanned occupational radiation exposure was discussed at the second conference. The licensee's response to abnormal surveillance findings and a degraded vital area barrier were discussed during the third conference. Management meetings with Region I personnel were also held at the licensee's request to discuss various program improvements.

One management meeting with NRR was held on March 26, 1985 regarding the licensee's request for schedular extension to November 30, 1985 for completion of environmental qualification of electrical equipment important to safety.

D. Licensee Event Reports

1. Tabular Listing

Type of Events:

A.	Personnel Errors	4
B.	Design/Man./Const./Install	10
C.	External Cause	0
D.	Defective Procedure	1
E.	Management/Quality Assurance Deficiency	0
X.	Other	20
	Total	35

LERs Reviewed

LER No. 84-13 to 85-27

2. Causual Analysis

Two sets of common mode events were identified:

a. LERs 84-14, 84-15, 84-17, 85-06, 85-15, and 85-17 reported inadvertent safety system actuations caused by maintenance or surveillance activities.

b. LERs 85-02, 85-05, 85-16, 85-20 and 85-24 involved missed surveillance tests.

E. Operating Reactor Licensing Actions

1. Schedular Extensions Granted

March 28, 1985 - extension until November 30, 1985 for completion of electrical equipment environmental qualification

2. Reliefs Granted

August 8, 1985 - relief from implementation of automatic switchover of RCIC suction per NUREG-0737 Item II.K.3.22

3. Exemptions Granted

December 18, 1984 - exemption from certain requirements of Appendix R, Section III.G.

4. License Amendments Issued

Amendment No. 81, issued October 9, 1984; deleted License Condition 3.D "Equalizer Valve Restriction"

Amendment No. 82, issued October 10, 1984; revised Technical Specifications relative to RPV thermal and pressurization limits

Amendment No. 83, issued November 7, 1984; revised Technical Specifications for surveillance instrumentation on suppression chamber water temperature, torus water level, containment pressure and high radiation, and vents.

Amendment No. 84, issued November 27, 1984; revised Technical Specifications to apply to Halon fire suppression system which replaced carbon dioxide system in the cable spreading room.

Amendment No. 85, issued December 17, 1984; added License Condition 3.I requiring the installation of a post-accident sampling system and a containment atmospheric monitoring system by June 30, 1985.

Amendment No. 86, issued April 5, 1985; revised Technical Specifications to permit changes in the normal full power background trip level for the main steam line high radiation scram and isolation setpoints to accommodate a short-term test of operation with hydrogen injection into the reactor coolant.

Amendment No. 87, issued April 22, 1985; revised Technical Specifications by reducing the maximum permitted oxygen concentration in the primary containment during plant operation from 5% to 4%.

Amendment No. 88, issued August 14, 1985; revised Technical Specifications to reflect changes in reporting requirements per 10 CFR 50.72 and 50.73 and Generic Letter 83-43 and to recognize changes in title, organization and responsibilities.

Amendment No. 89, issued August 30, 1985; revised radiological effluents sections of the Technical Specifications to meet Appendix I requirements.

Amendment No. 90, issued October 9, 1985; revised Technical Specifications by changing the Reactor Low Water Level (inside shroud) trip requirements.

TABLE 1

TABULAR LISTING OF LERS BY FUNCTIONAL AREA

PILGRIM NUCLEAR POWER STATION

Area	Number/Cause Code	Total
A. Plant Operations	1B, 8X	9
B. Radiological Controls	1X	1
C. Maintenance & Modifications	3A, 6B, 1D, 2X	12
D. Surveillance	1A, 3B, 8X	12
E. Fire Protection/ Housekeeping	1X	1
F. Emergency Protection	None	0
G. Security and Safeguards	None	0
H. Refueling & Outage Management	None	0
I. Licensing Activities	None	0
	Total	35

Cause Codes: A - Personnel Error
B - Design, Manufacturing, Construction or Installation Error
C - External Cause
D - Defective Procedures
E - Management/Quality Assurance Deficiency
X - Other

TABLE 2

LER SYNOPSIS (10/1/84 - 10/31/85)

PILGRIM NUCLEAR POWER STATION

LER Number	Summary Description
84-13	Jet pump instrumentation nozzle indications
84-14	Inadvertent RPS actuation (bus transfer)
84-15	Inadvertent containment spray actuation
84-16	Loss of power to 120 V AC bus Y-4
84-17	Loss of offsite power - unplanned diesel generator start
84-18	Inoperable motor operator for LPCI injection valve MO-1001-28A
84-19	MSIV isolation during startup
84-20	MSIV isolation during startup, LPCI valve not fully seated
85-01	SLCS system inoperable due to debris
85-02	Missed surveillance tests
85-03	Completion of a shutdown
85-04	Reactor vessel drain line leak
85-05	Missed surveillance test
85-06	Reactor scram during surveillance test
85-07	Secondary containment dampers inoperable
85-08	HPCI system inoperable
85-09	Reactor scram on turbine high vibration signal
85-10	Secondary containment dampers inoperable
85-11	Absolute versus gauge containment pressure transmitters
85-12	HPCI system inoperable; 5/18 trip, 5/23 isolation 6/6 trip
85-13	HPCI isolation on false high steam flow signal

LER Number	Summary Description
85-14	Reactor scram due to an inadvertent high water level isolation
85-15	Secondary containment isolation due to personnel error during during a surveillance test
85-16	Missed surveillance - reactor building vent gross radioactivity analysis
85-17	Secondary containment isolation due to personnel error during a surveillance test
85-18	Failure to meet technical specification requirements - inoperable secondary containment damper
85-19	Secondary containment dampers inoperable
85-20	Failure to conduct compensatory surveillance tests for inoperable ±A' diesel generator
85-21	Main steam line monitors "B" and "C" outside technical specification limits
85-22	Hot shop ventilation contamination
85-23	HPCI system inoperable
85-24	Missed surveillance test - station batteries
85-25	Reactor scram after load rejection
85-26	Inadequate surveillance procedure for control rod position indication
85-27	LPCI injection valve inoperable

TABLE 3

INSPECTION HOURS SUMMARY (10/1/84 - 10/31/85)

PILGRIM NUCLEAR POWER STATION

		HOURS	% OF TIME
A.	Plant Operations	1100	29
B.	Radiological Controls	513*	14
C.	Maintenance & Modifications	820	22
D.	Surveillance	646	17
E.	Emergency Preparedness	310	8
F.	Security and Safeguards	100	3
G.	Refueling & Outage Management	303.5	8
H.	Licensing Activities	**	**
	Total	3792.5	100%

* Includes hours for nonradiological chemistry inspection.

**Hours expended in facility license activities not included with direct inspection effort statistics.

TABLE 4

ENFORCEMENT SUMMARY (10/1/84 - 10/31/85)

PILGRIM NUCLEAR POWER STATION

	Severity Levels						
FUNCTIONAL AREAS	I	II	III	IV	V	DEV	Total
A. Plant Operations	-	-	-	4	2	-	6
B. Radiological Controls	-	-	1	1	1	2	5
C. Maintenance & Modifications	-	-	-	1	-	-	1
D. Surveillance	-	-	-	9	2	1	12
E. Emergency Preparedness	-	-	-	2	-	-	2
F. Security & Safeguards	-	-	1	-	-	-	1
G. Refueling & Outage Management	-	-	-	-	-	-	0
H. Licensing Activities	-	-	-	-	-	-	0
Totals by Severity Level	0	0	2	17	5	3	27

TABLE 5

ENFORCEMENT DATA

PILGRIM NUCLEAR POWER STATION

Insp. No.	Insp. Date	Severity Level	Functional Area	Violation
84-36	11/1-11/85	IV	Plant Operations	Failure to conduct an adequate shift turnover for control room personnel during refueling
		IV	Plant Operations	Failure to continuously monitor source range monitors during refueling
84-39	11/21-12/31/84	IV	Surveillance	Failure to promptly identify conditions adverse to quality (i.e. failure to initiate Failure and Malfunction Reports)
84-41	12/10-13/84	IV	Emergency Preparedness	Failure to diseminate emergency planning information
		IV	Emergency Preparedness	Failure to update the emergency plan and procedures
84-44	12/18-19/84	III	Radiological Controls	Failure to follow radiation work permit instructions and failure to establish a procedure for a remote reading teledosimetry system
85-01	1/1-31/85	V	Plant Operations	Failure to maintain control room staffing at levels required by 10 CFR 50.54
		IV	Surveillance	Failure to test the containment cooling subsystem immediately when the low pressure coolant injection system was inoperable
85-03	2/1/85-3/4/85	IV	Surveillance	Failure to conduct surveillance tests for the reactor protection system (six examples)
		IV	Surveillance	Failure to conduct rod block surveillance tests (five examples)

Insp. No.	Insp. Date	Severity Level	Functional Area	Violation
		IV	Plant Operations	Failure to promptly correct conditions adverse to quality (i.e. failure to take timely action on Quality Assurance surveillance findings)
		V	Surveillance	Failure to use the most current revision of a surveillance test procedure
		V	Surveillance	Failure to calibrate test equipment within the calibrated period
85-06	3/5/85-4/1/85	V	Plant Operations	Failure to maintain an uncalibrated local power range monitor in a bypassed state
		IV	Maintenance	Failure to conduct a dioctyl phthalate test of HEPA filters following maintenance on the standby gas treatment system
85-13	5/20-24/85	V	Radiological Controls	Failure to have the Operations Review Committee (ORC) review two radiological procedures and failure to control work in the fuel pool with a maintenance request
		Deviation	Radiological Controls	Failure to conduct an adequate review of systems that could generate an uncontrolled, unmonitored radioactive effluent release, as recommended in IE Bulletin 80-10
85-17	6/13/85-7/15/85	IV	Surveillance	Failure to conduct a surveillance surveillance test of the 250 V battery system required by the technical specification and to follow station procedures for additional battery tests
		IV	Radiological Controls	Failure to specify high radiation area surveillance frequencies on radiation work permits

Insp. No.	Insp. Date	Severity Level	Functional Area	Violation
		Deviation	Surveillance	Failure to conduct inservice tests as specified in an NRC submittal
85-20	7/16/85-8/19/85	IV	Surveillance	Failure to maintain the trip level setting for the "B" and "C" main steam line high radiation monitors within technical specification limits
85-21	7/16/85-7/30/85	IV	Surveillance	Failure to maintain secondary containment
		IV	Surveillance	Failure to test alternate safety system when an emergency diesel generator was found to be inoperable
		IV	Surveillance	Failure to initiate Failure and Malfunction Reports as required by station procedures
85-24	8/6-8/85	III	Security	Failure to maintain an adequate vital area barrier
85-26	8/20/85-9/23/85	IV	Plant Operations	Failure to properly authorize excessive licensed operator overtime as required by station procedures (thirty-five instances)
85-27	9/16/85-9/20/85	Deviation	Radiological Controls	Failure to install a protective conduit

TABLE 6

INSPECTION ACTIVITIES (10/1/84 - 10/31/85)

PILGRIM NUCLEAR POWER STATION

Inspection Report No.	Inspection Hours	Areas Inspected
84-28	259	Plant readiness for restart, team inspection
29, 30, 31, 32	---	Cancelled
33	174.5	Resident inspection, plant operations
34	---	1984 SALP Report
35	88	Emergency preparedness, remedial drill
36	41	Special inspection, source range monitor operation during refueling activities
37	18	Operator license examination
38	64	Containment integrated and local leak rate testing
39	402	Resident inspection, plant startup following a recirculation pipe replacement outage (see also inspection no. 85-01)
40	46	Startup test program
41	75	Emergency preparedness program
42	29	Startup physics testing
43	--	Cancelled
44	13	Special inspection, radiological controls for desludging the "C" monitor tank (see also inspection no. 85-02)
85-01	293	Resident inspection, plant startup following a recirculation pipe replacement outage (see also inspection no. 84-39)
02	58	Special inspection, followup on radiological controls actions (see also inspection no. 84-13)

Inspection Report No.	Inspection Hours	Areas Inspected
03	179	Resident inspection, plant operations
04	38	Physical security programs
05	24	Nonradiological chemistry program
06	195	Resident inspection, plant operations
07	64	Special inspection, followup on radiological controls actions, bulletins and circulars, and high reading TLDs
08	134.5	Resident inspection, plant operations
09	138	Vendor-licensee interface
10	---	Cancelled
11	216	Resident inspection, plant operations
12	27	Plant modifications and operations
13	70	Radiological controls program
14	30	Followup on previous inspection findings, plant operations
15	xx	Operating license examination
16	28	Special inspection, unauthorized maintenance and modification activities on the high pressure coolant injection (HPCI) system
17	98	Resident inspection, plant operations
18	37	Followup to HPCI waterhammer events and pipe snubber inspection program
19	147	Emergency preparedness, annual exercise
20	132.5	Resident inspection, plant operations
21	24	Special inspection, review of licensee response to two abnormal surveillance test results

Inspection Report No.	Inspection Hours	Areas Inspected
22	35	Radiological controls program
23	109	Radiochemistry program, mobile laboratory
24	12	Special inspection, review of licensee response to a degraded vital area barrier
25	6	Enforcement Conference, concerning NRC inspection nos. 85-21 and 85-24
26	86	Resident inspection, plant operations
27	140	Post accident sampling system and related accident monitoring system review
28	148	Resident inspection, plant operations
29	114	Special inspection, refuel bridge damage followup

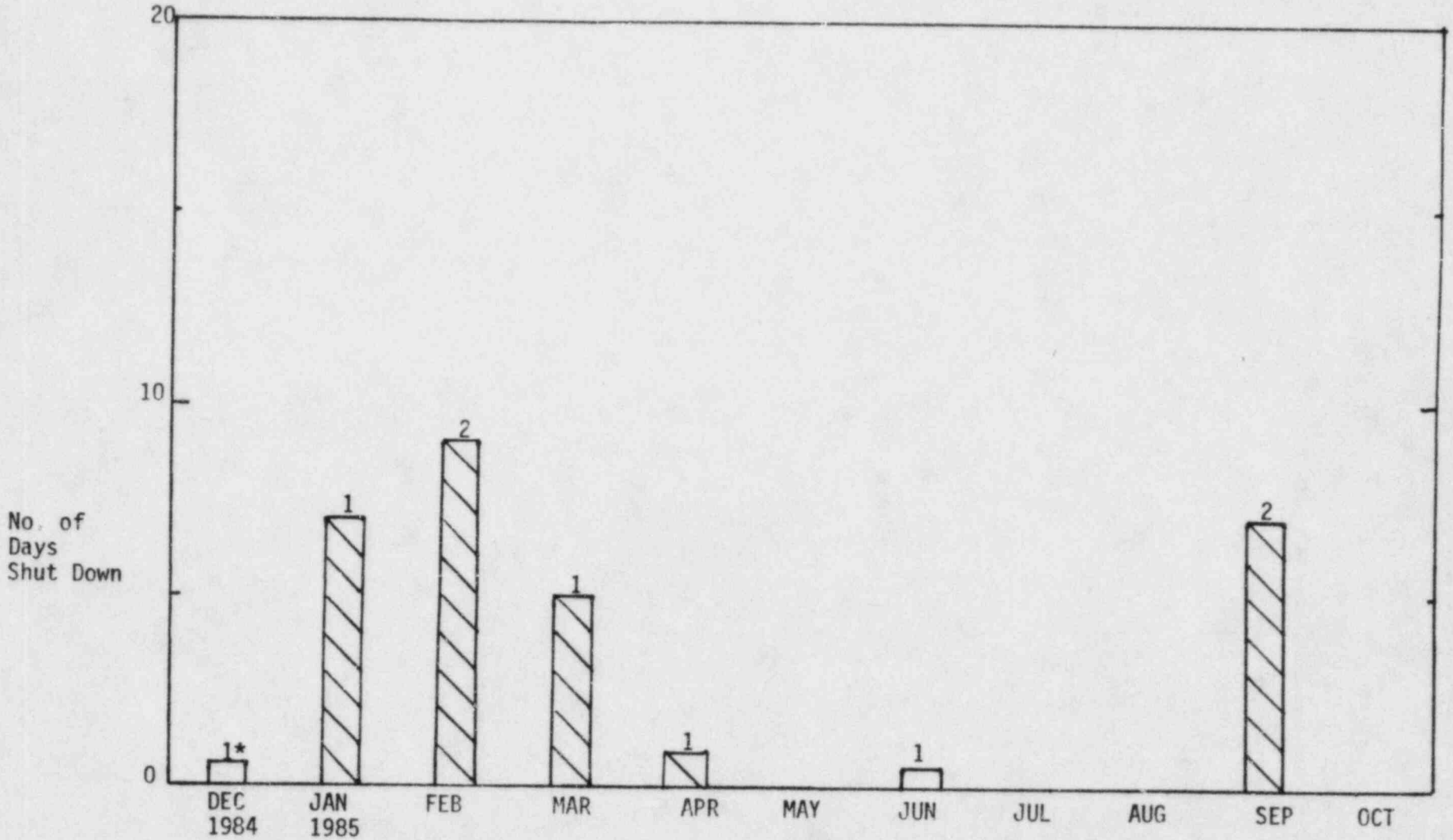
TABLE 7

PLANT SHUTDOWNS

Shutdown Period	Description	Cause
Dec. 11, 1983 to Dec. 24, 1984	Refueling and recirculation pipe replacement outage.	---
Dec. 24, 1984	Startup from the outage.	---
Dec. 25, 1984	Shutdown from low power due to erratic indication of reactor water level instruments during the startup. Trapped air in instrument reference legs is a long standing problem.	Design (trapped air possible in instrument lines) or procedure weakness (venting instrument lines following an extended outage not adequate).
Jan. 1, 1985 to Jan. 7, 1985	Shutdown due to the presence of debris in SLCS and for maintenance on torus to drywell vacuum breakers.	Poor housekeeping (SLCS) and component malfunction (vacuum breakers).
Feb. 9-15, 1985	Shutdown to replace failed recirculation pump bearings. The bearing failure was caused by a loss of pump lubricating oil inventory. The oil loss was caused by a leak in an oil packing gland that surrounds a cooling water line.	Component malfunction and procedure weakness (response to a hi/lo oil level alarm not adequate).
Feb. 15-18, 1985	Shutdown to repair a leaking weld in the reactor vessel drain line.	Component malfunction.
March 15-20, 1985	Scram from 100% power on a false high reactor pressure signal caused by a sticking instrument valve. The shutdown was continued to complete maintenance on the reactor water sample system and secondary containment dampers.	Design weakness (instrument valves prone to stick) or personnel error (valve overtightened).
June 14, 1985	Scram from less than 10% power due to a high reactor water level isolation during low power maneuvers.	Personnel error.
April 4-5, 1985	Scram from 85% power due to a false turbine high vibration signal.	Design weakness (turbine trip logic is <u>one</u> out of n).

Shutdown Period	Description	Cause
Sept. 1-5, 1985	Scram from 32% power due to high reactor pressure following a generator load rejection. The load rejection was caused when a ground fault occurred in the station switchyard during washing activities. The fault was caused by a buildup of ocean salt on switchyard insulators. A leaking recirculation pump seal was replaced while the reactor was shut down.	Design weakness (portions of switchyard must be washed live).
Sept. 5-7, 1985	Shutdown to replace an additional leaking recirculation pump seal.	Design or maintenance weakness.

FIGURE 1. Pilgrim Unplanned Reactor Shut Downs



*Number of shut downs per month. The recirculation pipe replacement outage ended on December 24, 1984.