UNITED STATES NUCLEAR REGULATORY COMMISSION

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

NOTICE OF ISSUANCE OF FINAL DIRECTOR'S DECISION

Notice is hereby given that the Director, Office of Nuclear Reactor Regulation, has issued a final decision concerning a request filed pursuant to 10 CFR 2.206 by the Honorable William B. Golden which requested that the Pilgrim Nuclear Power Station remain shut down or have its license suspended because of (1) deficiencies in the licensee management, (2) inadequacies in the emergency radiological plan, and (3) inherent deficiencies in the containment structure.

The Director of the Office of Nuclear Reactor Regulation issued an Interim Director's Decision on the Petition dated August 21, 1987. The Interim Decision concluded that the Petition with the exception of the licensee management issue, should be denied. The reasons for the Decision were explained in the "Interim Director's Decision Under 10 CFR 2.206," DD-87-14, which is available for public inspection in the Commission's Public Document Room, Gelman Building, Lower-Level, 2120 L Street, N.W., Washington, DC 20555 and at the Local Public Document Room at the Plymouth Public Library, 11 North Street, Plymouth, Massachusetts 02360.

The Director of the Office of Nuclear Reactor Regulation has determined that the remaining issue, deficiencies in the licensee management, should be denied. The reasons for this decision are explained in the "Final Director's Decision Under 10 CFR 2.206," DD-88-16, which is available for public inspection in the Commission's Public Document Room, in the Gelman Building, Lower-Level, 2120 L St., N.W. Washington, DC 20555 and at the Local Public Document Room at the Plymouth Public Library, 11 North Street, Plymouth, Massachusetts 02360.

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A copy of the Decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in this regulation, the Decision will constitute the final action of the Commission twenty-five (25) days after issuance, unless the Commission, on its own motion, institutes review of the Decision within that time period.

Dated at Rockville, Maryland, this 6th day of October 1988.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard H. Wessman, Director
Project Directorate I-3
Division of Reactor Projects I/II

D McDonald
NRR
1401

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

JUL 27 1988

Docket No. 50-293

Boston Edison Company
ATTN: Mr. Ralph G. Bird
Senior Vice President - Nuclear
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, Massachusetts 02360

Gentlemen:

Subject: Systematic Assessment of Licensee Performance (SALP)
Board Report No. 50-293/87-99

Enclosed for your review, prior to our scheduled meeting of August 25, 1988, is the SALP Board Report for Pilgrim Nuclear Power Station covering the period February 1, 1987 through May 15, 1988.

In accordance with NRC policy, I have reviewed the SALP Board Report and concur with the assigned ratings. Highlights of the report are set forth below:

1. Category 1 performance rating was assigned to Engineering and Technical Support which continued strong performance through the assessment period.

2. Category 2 ratings were given in the functional areas of Surveillance, Fire Protection, Security and Safeguards and Assurance of Quality acknowledging Boston Edison Company's extensive efforts to upgrade performance from the previously assigned Category 3 ratings.

3. Category 3 Improving rating was assigned to the Radiological Controls functional area.

The assignment of the Category 3 improving rating indicates that improvement in the organization, programs and performance were noted in the Radiological Controls functional area. However, in our view the results of these initiatives were coming to fruition at the close of the assessment period, and had not yet demonstrated the ability to sustain improved performance.

Additionally, on July 8, 1988, Region I advised you that Pilgrim remains categorized by NRC Senior Management as a plant that requires continued close monitoring and demonstration of programs which establish and implement performance improvements. This was done in conjuction with a letter from the NRC's Executive Director for Operations to your Chief Executive Officer. We recognize the progress demonstrated to date as a result of your extensive efforts, however, continued vigilance on your part is necessary to achieve and sustain overall results. NRC will also continue its increased attention to your facility. In this regard, we will conduct an assessment team inspection to further measure the effectiveness and readiness of your management controls, programs and personnel to support safe restart of the facility. Further, I plan to shorten the current SALP assessment period to permit an additional opportunity to measure the results of your programs.

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At the SALP management meeting, please be prepared to discuss your evaluation of our assessment and the status of your performance improvement programs. Additionally, we solicit written comments within 30 days after the meeting to enable us to thoroughly evaluate your response and to provide you with our conclusions relative to them. Specifically, you are requested to respond addressing actions planned to continue to improve performance in the Radiological Controls area.

Your cooperation with us is appreciated. Should you have any questions concerning the SALP report, we would be pleased to discuss them with you.

Sincerely,

W T Russell

William T. Russell
Regional Administrator

Enclosure:
As stated

cc w/encl:
K. Highfill, Station Director
R. Anderson, Plant Manager
J. Keyes, Licensing Division Manager
E. Robinson, Nuclear Information Manager
R. Swanson, Nuclear Engineering Department Manager
The Honorable Edward J. Markey
The Honorable Edward P. Kirby
The Honorable Peter V. Forman
B. McIntyre, Chairman, Department of Public Utilities
Chairman, Plymouth Board of Selectmen
Chairman, Duxbury Board of Selectmen
Plymouth Civil Defense Director
P. Agnes, Assistant Secretary of Public Safety, Commonwealth of Massachusetts
S. Pollard, Massachusetts Secretary of Energy Resources
R. Shimshak, MASSPIRG
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Massachusetts (2)
Chairman Zech
Commissioner Roberts
Commissioner Carr
Commissioner Rogers
K. Abraham, RI (18 copies)

bcc w/encl:
Region I Docket Room (with concurrences)
M. Perkins, RI (w/o encl)
W. Russell, RI
J. Allan, RI
D. Holody, RI
W. Kane, RI
S. Collins, RI
J. Wiggins, RI
R. Blough, RI
L. Doerflein, RI
M. Kohl, RI
W. Johnston, RI
J. Durr, RI
R. Gallo RI
W. Oliveira, RI
S. Ebneter, RI
G. Sjoblom, RI
R. Bellamy, RI
R. Bores, RI
J. Taylor, DEDO
B. Boger, NRR
R. Wessman, NRR
D. McDonald, NRR
F. Akstulewicz, NRR
Board Members

ENCLOSURE

SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT 50-293/87-99

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

ASSESSMENT PERIOD: FEBRUARY 1, 1987 - MAY 15, 1988

BOARD MEETING DATE: JULY 5 and 6, 1988

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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 observations and data on a periodic basis and to evaluate licensee performance. The SALP process is supplemental to the normal regulatory processes used to ensure compliance to NRC rules and regulations. It is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to licensee management in order to improve the quality and safety of plant operations.

An NRC SALP Board, composed of the Staff members listed in Section 1.2 below, met on July 5 and 6, 1988 to review the collection of performance observations and data in order to assess the Boston Edison Company's (BECo) performance at the Pilgrim Nuclear Power Station. This assessment was conducted 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 2.0 of this report.

This report is the SALP Board's assessment of the licensee's safety performance at the Pilgrim Nuclear Power Station for the period February 1, 1987 - May 15, 1988 . The summary findings and totals reflect a 15 month assessment period.

1.2 SALP Board Members

Chairman

S. J. Collins, Deputy Director, Division of Reactor Projects (DRP)

Members

- W. F. Kane, Director, DRP
- J. T. Wiggins, Chief, Reactor Projects Branch 3, DRP
- A. R. Blough, Chief, Reactor Projects Section 3B, DRP
- J. P. Durr, Chief, Engineering Branch, Division of Reactor Safety (DRS)
- G. L. Sjoblom, Acting Director, Division of Radiation Safety and Safeguards (DRSS)
- R. R. Bellamy, Chief, Facilities Radiological Safety and Safeguards Branch, DRSS
- D. H. Wessman, Director, Project Directorate I-3, Office of Nuclear Reactor Regulation (NRR)
- D. G. McDonald, Licensing Project Manager, NRR
- C. C. Warren, Senior Resident Inspector, Pilgrim Nuclear Power Station (PNPS), DRP

Other Attendees

J. J. Lyash, Resident Inspector, Pilgrim NPS, DRP
T. K. Kim, Resident Inspector, Pilgrim NPS, DRP
T. F. Dragoun, Senior Radiation Specialist, DRSS
G. C. Smith, Safeguards Specialist, DRSS
R. M. Gallo, Chief, Operations Branch, DRS
A. G. Krasopoulis, Reactor Engineer, DRS
T. Koshy, Reactor Engineer, DRS

1.3 Background

A. Licensee Activities

The plant has been shut down since April 12, 1986 for maintenance and to make program improvements and remained shut down throughout this assessment period. The reactor was defueled on February 13, 1987, to facilitate extensive maintenance and modification of plant equipment. The licensee completed fuel reload on October 14, 1987. The reactor vessel hydrostatic test and the containment integrated leak rate test were also completed successfully.

Since the end of the last SALP period there have continued to be extensive management changes at Boston Edison that affect Pilgrim. The licensee has aggressively recruited experienced personnel from outside sources. A new Senior Vice President assumed responsibility for the nuclear organization at the beginning of the period. The licensee's organizational structure was also significantly altered several times. Recent changes have more clearly defined the permanent onsite organizational structure. Essentially all key management positions had been filled with permanent employees by the close of the period.

The licensee developed several integrated action and testing plans to evaluate the readiness of plant management, staff and hardware to support restart. These include the Restart Plan, Material Condition Improvement Action Plan, Radiological Action Plan and Power Ascension Test Program. In addition, the licensee performed a self assessment near the end of the SALP period to identify plant issues and evaluate the effectiveness of implemented improvement actions.

During the assessment period the licensee completed extensive plant hardware and procedure modifications. The licensee's Safety Enhancement Program included addition of a third emergency diesel generator, containment spray header nozzle changes, installation of a backup nitrogen supply system, and additional protection features for anticipated transient without scram. Steps were also taken toward installation of a direct torus vent system and installation of a diesel driven fire pump tied to the residual heat removal system. License exemptions and modifications to the fire protection program and equipment to bring the plant into full compliance with 10 CFR 50 Appendix R, and to improve reactor level instrumentation were completed. The facility Emergency Operating Procedures were also upgraded to incorporate Revision 4 of the Boiling Water Reactor Owners Group Emergency Procedures Guidelines.

On March 31, 1987, the station experienced a loss of offsite power during a storm when a static line broke and fell onto the conductors at a location several miles from the site. Offsite power was restored within 45 minutes. A second loss of offsite power event occurred on November 12, 1987 due to excessive ice and snow accumulation on the transmission system during a severe winter storm. This event was complicated by a lockout of the plant startup transformer, the removal of one of the emergency diesel generators from service due to maintenance concerns and the limited availability of instrument air. A source of offsite power was reestablished about 21 hours after the initial loss. An NRC Augmented Inspection Team was dispatched to the site in response to this event.

On November 9, 1987, the licensee as a conservative measure halted ongoing maintenance and modification work at the station after determining that several incidents which occurred during the weekend of November 7 and 8, 1987, raised concerns regarding the control of ongoing work activities. The licensee's Senior Vice President-Nuclear directed that ongoing maintenance and modification work onsite be suspended, and contractor craft personnel were instructed to leave the site and were directed not to report for work until November 12, 1987. The licensee subsequently formed eight teams of engineering and management personnel to perform detailed evaluations of each incident prior to resuming station work activities.

On February 11, 1988, the control room received a report of a fire in a contaminated area of the machine shop. The licensee conservatively declared an Unusual Event. The fire was confined to a small area and was identified as burning insulation from a heat-treating machine which was being used in the machine shop. The fire was extinguished by the plant fire brigade with no plant damage noted, and the Unusual Event was secured.

Operator licensing examinations were conducted on two occasions during the period. A total of two senior reactor operators and 14 reactor operator candidates were examined with all candidates successfully completing the examinations.

In December 1986, the Secretary of Public Safety for the Commonwealth of Massachusetts (Charles V. Barry) submitted a report to Governor Dukakis assessing the status of offsite emergency preparedness for the Pilgrim station. The report identified several problems with the existing response program. FEMA performed a self-initiated review of the Pilgrim emergency response plan and on August 5, 1987, provided its report to the Commonwealth. FEMA identified six deficient areas and withdrew its interim finding that Massachusetts offsite emergency planning and preparedness were adequate to protect the public health and safety in the event of an accident at Pilgrim. The NRC requested the licensee to provide its plans and schedule for working with state and local organizations to resolve the deficiencies. The licensee submitted an action plan to address the deficiencies on September 17, 1987. A progress report issued October 15, 1987 by Charles V. Barry notes that, while substantial progress had been made in some areas, adequate plans for response to an accident at Pilgrim did not exist and substantial work remained to be done. At the close of the assessment period, the licensee was actively working with the Commonwealth and local agencies to address the deficiencies and upgrade the emergency plans.

B. Inspection Activities

Confirmatory Action Letter (CAL) 86-10 was issued in April, 1986 in response to a series of operational events. The CAL initially required that the licensee address these events, and was subsequently extended in August, 1986 to include resolution of programmatic and management concerns. In addition the CAL stated that the NRC Regional Administrator's approval would be required prior to restart. The CAL remained in effect throughout this assessment period.

Considerable inspection resources were expended at Pilgrim during this assessment period. The resident staff has been maintained at three inspectors. During the fifteen month assessment period, over 9698 hours of direct NRC inspection were performed (7758 hours on an annual basis). This represents a 43 percent increase above the previous assessment period, and is significantly in excess of that normally allocated to a single unit site. A detailed breakdown of the total inspection hours into SALP functional areas is included in Table 2.

Senior NRC management involvement was substantial during the period. Early in the assessment period, a Pilgrim Restart Assessment Panel was formed which consists of senior management from the NRC Office of Nuclear Reactor Regulation (NRR) and Region I. The panel generally meets biweekly to coordinate the planning and execution of NRC activities, and to assess the results of these activities to provide an independent judgement of the plants readiness for operation. A series of management meetings to discuss the licensee's progress and proposed programs were also held. Frequent site tours by NRC Commissioners, the Director of Nuclear Reactor Regulation and the Regional Administrator were conducted. NRC senior management participated in numerous public meetings and interacted extensively with local, state and federal officials. The NRC conducted public meetings in Plymouth to receive public comments on the plan. The staff's assessment of the comments and concerns received on the Restart Plan was presented to the public during a followup public meeting. A chronological listing of management meetings and tours is included as Table 5.

On July 15, 1986, Massachusetts State Senator William B. Golden and others filed a 10 CFR 2.206 petition regarding Pilgrim. After review by the NRC, the contentions raised in the petition regarding containment deficiencies and inadequacies in the radiological emergency response plan were denied. A decision regarding the management deficiencies was deferred to a subsequent response. This information was transmitted to the petitioners by letter dated August 21, 1987. Three of the petitioners filed an appeal in federal court on October 1, 1987.

On October 15, 1987, Massachusetts Attorney General James M. Shannon filed a 10 CFR 2.206 petition, on behalf of his office and Governor Michael S. Dukakis, requesting an order to show cause why Pilgrim should not remain shutdown until a full adjudicatory hearing resolves the issues raised in the petition. The petition cites evidence of continuing managerial, Mark I containment, and emergency planning deficiencies and requests that the licensee also be required to perform a probabilistic risk assessment (PRA). In a response dated May 27, 1988, the NRC denied the petitioners request that a PRA regarding the Mark I containment be required and deferred decisions regarding emergency planning and management issues.

During the assessment period nine NRC team inspections were conducted:

1. Appendix R Fire Protection Program Review
2. Plant Modification Program Review
3. Plant Effluent and Environmental Monitoring Program Review
4. Augmented Inspection Team (AIT) Review of the loss of off-site power event on November 12, 1987
5. Annual Emergency Plan Exercise Observation
6. Onsite Electrical Distribution Adequacy Review
7. Emergency Operating Procedures Review
8. Maintenance Program Review
9. In-plant Radiological Controls Review

An NRC Order issued in 1984 requiring the licensee to implement a Radiation Improvement Program was closed during the period based on the results of a special inspection and other program inspections which indicated that all terms of the Order had been satisfactorily completed. Two operator licensing examinations were also conducted. An enforcement conference was held on September 9, 1987 to discuss security related matters. Enforcement action on these issues is still pending.

Tabulations of inspection activities and associated enforcement actions are contained in Tables 2 and 3.

2.0 CRITERIA

Licensee performance is assessed in selected functional areas, depending upon whether the facility is in a construction, preoperational, or operating phase. Functional areas normally represent areas significant to nuclear safety and the environment. Some functional areas may not be assessed because of little or no licensee activities, or lack of meaningful observations. Special areas may be added to highlight significant observations.

This report also discusses "Training and Qualification Effectiveness", "Assurance of Quality" and "Engineering and Technical Support" as separate functional areas. Although these topics, in themselves, are assessed in the other functional areas through their use as criteria, the three areas provide a synopsis. For example, assurance of quality effectiveness has been assessed on a day-to-day basis by resident inspectors and is an integral aspect of specialist inspections. Major factors that influence quality, such as involvement of first line supervision, safety committees, quality assurance, and worker attitudes, are discussed in each area.

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 the resolution of technical issues from a safety standpoint

3. Responsiveness to NRC initiatives

4. Enforcement history

5. Operational events (including response to, analyses of, and corrective actions for)

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

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

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

The SALP Board also assesses a 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 SALP trend categories are as follows:

Improving: Licensee performance was determined to be improving near the close of the assessment period.

Declining: Licensee performance was determined to be declining near the close of the assessment period and the licensee had not taken meaningful steps to address this pattern.

A trend is assigned only when, in the opinion of the SALP Board, the trend is significant enough to be considered indicative of a likely change in the performance category in the near future. For example, a classification of "Category 2, Improving" indicates the clear potential for "Category 1" performance in the next SALP period.

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

It should also be noted that the industry continues to be subject to rising performance expectations. For example, NRC expects licensees to actively use industry-wide and plant-specific operating experience to effect performance improvement. Thus, a licensee's safety performance would be expected to show improvement over the years in order to maintain consistent SALP ratings.

3.0 SUMMARY

3.1 Overall Facility Evaluation

The 1985 SALP determined that programmatic and performance weaknesses existed in several functional areas and that improvements were inhibited by the lack of resolution of factors which in turn depended heavily on management attitudes and aggressiveness of followup.

The 1986 SALP acknowledged that, although some improvements were made, the lack of a clear organizational structure, recurring management changes, and chronic staffing vacancies delayed the establishment of a stable licensee management team at the plant and inhibited progress during the period. These problems manifested themselves as Category 3 performance ratings in the Radiological Controls, Surveillance, Fire Protection, Security and Assurance of Quality functional areas.

Throughout this 1987-1988 SALP period the facility was maintained by BECO in an outage condition to make major plant facility modifications and complete a major equipment refurbishment program.

At the beginning of the assessment period the licensee made the most significant of numerous personnel changes when a new Senior Vice President-Nuclear was hired and his presence established on site. Additional personnel and organizational changes continued throughout the assessment period with the most substantial reorganization being completed in February, 1988. Although the organization in its present form did not formally emerge until late in the assessment period, many of the functional reporting chains have been in place for some time and appear to be functioning well. Allocated staffing levels in the new organization are significantly higher than in the past and the licensee has been generally successful in recruiting efforts. As a result of these transitions some individuals are relatively new to their positions and in some cases do not have extensive operating Boiling Water Reactor expertise.

The licensee has been aggressive in addressing most areas of known program weakness. However, implementation of certain program and organizational improvements was delayed due to the high priority placed on proceeding with outage work. Surveillance program responsibilities have been consolidated in the Systems Engineering Group and program weaknesses have been addressed. Hardware issues in both the fire protection and security areas have been corrected and performance in these areas has improved. Health Physics program problems identified in the previous SALP report continued to exist during the first half of this assessment period, however recent significant management attention and resource commitment to this area led to improved performance over the last part of the assessment period. Maintenance program improvements were implemented only recently and their effectiveness remains under review. Licensee development of the Material Condition Improvement Action Plan, Restart Plan and performance of an extensive self assessment in response to the NRC August 1986 Confirmatory Action letter are evidence of the licensee's ability to self-identify and understand facility performance and material condition. The action plans to implement these necessary improvements and management's ability to effect lasting performance change remained under review at the close of the assessment period.

In summary, licensee efforts have been extensive including corporate and site reorganizations and a new management team which has undertaken numerous projects and programs to improve plant material condition and enhance programmatic performance. Management initiatives have been generally successful in correcting staffing, organization and material deficiencies. Programmatic performance improvements have been evident in areas of previously identified significant weakness and the licensee's self assessment process has identified areas where further management attention is warranted. In light of the past inability to implement lasting programs which result in long term improvements, a continued licensee management commitment is needed to confirm that past weakness have been identified and sustain the overall improving trend in performance.

3.2 Facility Performance

Functional Area		Category Last Period*	Category This Period**	Recent Trend
1.	Plant Operations	2	2	
2.	Radiological Controls	3	3	Improving
3.	Maintenance and Modifications	2	2	
4.	Surveillance	3	2	
5.	Fire Protection	3	2	
6.	Emergency Preparedness	2	2	Improving
7.	Security and Safeguards	3	2	
8.	Engineering and Technical Support	1	1	
9.	Licensing Activities	2	2	
10.	Training and Qualification Effectiveness	2	2	
11.	Assurance of Quality	3	2	
	Outage Management and Modifications Activities	1	***	

* November 1, 1985 to January 31, 1987
** February 1, 1987 to May 15, 1988
*** Not evaluated as a separate functional area; findings relative to outage activities are integrated into "Engineering and Technical Support", "Maintenance and Modifications", and other functional areas as appropriate

4.0 PERFORMANCE ANALYSIS

4.1 Plant Operations (2178 hours/22 percent)

(1) Analysis

This functional area is intended to assess the licensee's performance of plant operations. Throughout this assessment period the plant was in an extended maintenance and refueling outage. NRC observations of licensee performance during major plant activities included reactor core defuel and reload, the reactor vessel hydrostatic test, and the primary containment integrated leak rate test.

During the previous SALP period plant operations was assessed as a Category 2. Weaknesses identified included a shortage of licensed reactor operators and lack of professional support for the Operations Department. Although the licensee had taken actions to recruit new operators and improve the licensed operator training program, the shortage of licensed reactor operators (ROs) remained a significant problem. The effectiveness in professional staff support for the Operations Department was also not demonstrated due to delays in transferring personnel into the department, and their continuing collateral duties outside the department.

During the current assessment period, the licensee's planning and evaluation of their readiness for refueling, the reactor vessel hydrostatic test, and the primary containment integrated leak rate test were well managed. Strong Operations Department involvement was evident. Plant management and the Operations Review Committee (ORC) exhibited a conservative, safety conscious approach to these milestones. ORC review of refueling readiness was conducted in a thorough and deliberate manner including line item verification of the reload checklist. One exception was the licensee's use of Appendix G to the Final Safety Analysis Report to justify conditional operability of equipment needed for refueling. In this case plant management proposed to begin fuel movement with a Standby Gas Treatment System design deficiency uncorrected, by preparing an analysis supporting operability of the system under restricted conditions. Licensee management however, reconsidered this practice when concerns were raised by the NRC. Licensee senior management support for ORC decisions was visible throughout these major activities. Senior management's presence and direct involvement in activities also demonstrated their commitment to safety and expectations of high standards to the plant staff.

The licensee has taken aggressive actions to resolve the shortage of licensed operators. Improvements in recruiting and operator training programs have resulted in a significant increase in the size of the operations staff. The number of licensed reactor operators (ROs) increased by 14 during the period to the present total of 23. This contributed to a reduction in routine operator overtime, which had been a chronic past problem. The addition of new licenses to the operations staff is positive. However, additional operating experience will be required before these newly licensed personnel are fully qualified. The high RO attrition rate was a major factor in the RO shortage during the last assessment period. Increased management attention, reduced overtime, and higher morale have contributed to maintaining a stable operations organization during this period. The licensee currently maintains a staff of 20 equipment operators and eight of the 20 are scheduled to enter a reactor operator license training class later this year. Continued management support in maintaining a sound and aggressive recruiting and training program is required to prevent the recurrence of the operator shortage.

Despite the improvements in the staffing level, weaknesses continued to exist in attention to detail and in communications. Several procedural and personnel errors occurred during the refueling, the reactor vessel hydrostatic test, and the containment integrated leak rate test. Immediate actions taken by the operations staff in response to incidents were not always conservative. For example, operators continued refueling without stopping to assess a pendant light which was inadvertently dropped onto the reactor core. Problems in the operations area that contributed to the licensee's work stoppage on November 9, 1987 included inadequate system turnover, valve lineup problems, and poor radwaste system operation practices. Some weakness in coordination and communications between the operations staff and other groups was noted during the loss of offsite power (LOOP) event on November 11, 1987. The lack of clear management directions both in and out of the control room, a somewhat fragmented recovery effort, and poor communications may have delayed the full recovery from the LOOP and resulted in inadvertent manual shutdown of one of the emergency diesel generators. As a further example, operator communication during a dry run of the remote shutdown test was also informal and not completely effective.

During previous assessments, informality and poor attitude had been identified as a weakness among the control room staff. The discovery by the licensee of non-job related reading material and a card playing machine in the control room in October, 1987 was a further example of the lack of professionalism and implied inattentiveness to duty. As a result of management attention to this issue, positive trends in the control room atmosphere and conduct were noted during the last quarter of the assessment period. The significant increase in the size of the operations staff, strict control of operator overtime, and intensive communication training also aided licensee management's successful effort to improve operator professionalism. As an example, effective use of the simulator for training and implementation of control room hardware improvements have enhanced the control room atmosphere.

Significant effort has been made by the licensee to provide adequate support staff in the Operations Department. The department was reorganized and the Operations Support Group was created to strengthen effectiveness in identifying and resolving technical issues affecting Operations. The Operations Support Group consists of three staff engineers and six shift technical advisor (STA) positions. The licensee has filled the group manager and senior staff engineer positions and is actively recruiting to fill the other staff engineer positions. Three additional STAs were hired and trained during this period which increased the total number of qualified STAs to six. This represents an increase of six in the allocated operations support staff with four of the positions filled. The reorganization allowed the Chief Operating Engineer added opportunity to directly oversee operator performance. Operations staff involvement in developing and implementing the Emergency Operating Procedures was strong. The licensee's ongoing effort to develop a jumper and lifted lead log and a limiting condition of operation log are additional indications of improving staff support in the Operations Department.

The licensee's approach to problem investigation and root cause analysis improved significantly during the latter portion of the period. Event critiques led by the Operations Section Manager and root cause analyses performed by the onsite Systems Engineering Group were thorough and aggressive. The critique process also instilled a leadership role for the Operations Department and promoted better communication among interdepartmental groups.

The operator training program continued to improve during this assessment period. NRC operator license examinations on May 25, 1987 and December 7, 1987 had a 100 percent pass rate. Utilization of the plant specific simulator in requalification training and the new Emergency Operating Procedure training significantly enhanced the effectiveness of the training program. The licensee's effort to develop and implement the new Emergency Operating Procedures demonstrated high levels of senior management attention.

Reportable events were generally handled acceptably by the control room staff. The levels of detail, technical accuracy, and the overall quality of licensee event reports have improved during the period.

Monitoring and maintenance of plant chemistry is the responsibility of the Operations Department. The licensee's chemistry department is responsible for plant chemistry, radiochemistry, and the facility radiological effluents control program. The chemistry organization was clearly defined, adequately staffed, and appeared to interface well with other plant groups including the radwaste organization. Chemistry representatives are included in shiftly turnovers with the control room staff. Importent plant chemistry parameters are discussed with station management daily at a morning planning meeting. Surveillance requirements were clearly established and performed on schedule. The licensee is meeting Technical Specification requirements for radiological effleunt sampling and analysis. Effluent control instrumentation was maintained and calibrations performed in accordance with regulatory requirements. All release records were complete and well maintained. QA audits of this area were comprehensive and technically thorough.

The results comparison of NRC radioactivity standards submitted to the licensee for analyses indicated excellent performance by the licensee with all results in agreement. During the analysis of the NRC radioactivity standards, the licensee's chemistry staff demonstrated a clear understanding of the technical issues. In addition, the licensee was responsive to NRC suggested practices for program improvements. The licensee's chemical measurement capability was also evaluated twice during the assessment period. The results of the NRC chemical standards indicated good performance with only four of 54 measurements in disagreement. The licensee was responsive to NRC suggestions for program improvements in this area and also in the area of post accident sample analyses. Licensee management appears committed to providing adequate capital resources to the

Chemistry Department. The licensee possesses state of the art chemical and radiochemical laboratory instrumentation, and also maintains a state of the art chemistry computer data base for maintaining and trending laboratory data. The licensee's chemistry training program was also reviewed this assessment period. Both the training and retraining programs appear to be adequate as indicated by the results of the NRC standards analyses.

In summary, the licensee's aggressive recruiting and training program has resulted in a significant increase in the size and effectiveness of the Operations Department staff, the staffing improvement, strict control of operator overtime, appropriate management attention, and intensive communications training all have contributed to a recent trend in positive attitude and professional atmosphere in the control room. However, some weakness in attention to detail and procedural compliance were noted and require continued attention. The licensee's approach to problem investigation and root cause analyses has improved, and is generally prompt and positive. Overall performance in this functional area has improved, particularly during the last quarter of the assessment period.

(2) Conclusion

Rating: 2

Trend: None Assigned

4.2 Radiological Controls (1064 hours/12 percent)

(1) Analysis

The radiological controls functional area is an assessment of licensee performance in implementing the occupational radiation safety, chemistry, radiological environmental monitoring and transportation programs. In November 1984, the NRC issued a confirmatory order requiring broad scope improvements in the licensee's Radiological Controls Program. During the previous assessment period this area was rated Category 3. The NRC review found that some improvement had been made in the radiation safety program. However, significant weaknesses were identified which inhibited further performance improvement. These weaknesses included poor communications, antagonistic working relationships, lack of personnel accountability, poor ALARA performance, ineffective corrective actions, and vacancies in key radiological safety supervisory and management positions. As a result of these weaknesses the NRC confirmatory order was not closed out. Weaknesses were also identified in implementation of Radiological Effluent Technical Specification surveillance requirements and the licensee's environmental TLD program. During the previous assessment period, the licensee's transportation program exhibited a decline in performance with three violations being identified.

During the current assessment period there were nine inspections in this area of the occupational radiation safety program. The inspections focused on oversight of outage work, establishment of effective management controls for this area and efforts to close out the NRC Confirmatory Order and associated Radiological Improvement Plan (RIP). In addition, three inspections were performed in the chemistry, transportation, and radwaste systems areas.

Radiation Protection

The weaknesses noted during the previous assessment period persisted through the first half of this assessment period. However, in November, 1987 an inspection found that performance had improved to the point that the November 1984 NRC Confirmatory Order was closed out but, at the same time, acknowledged that additional improvements and continued management attention to these areas were needed. Actions that are planned by the licensee to continue to improve performance such as improved radiological awareness and increased staffing are documented in the licensee's Radiological Action Plan (RAP).

Toward the end of this period, the Radiation Protection program organization and staffing levels, a weakness during most of the assessment, improved. The organization, staffing levels, responsibilities, accountabilities, and interfaces are now well defined. Station management attention to the areas of communications, accountability, morale and the corrective action process over the last half of the period has improved working relationships and communications between other departments and radiation protection.

The recently revised Radiation Protection organization is approximately 90% filled by permanent personnel. Although the organization and staffing are adequate to support the program, the position of Chief Radiological Engineer (Radiation Protection Manager) was recently restaffed with a contractor, several managers have limited commercial nuclear power experience, and many personnel are new to their positions. Performance of this new organization will continue to be assessed in the future.

A well defined training and qualification program has been established. The program contributes to an adequate understanding of program requirements with few personnel errors. Training resources are adequate. The radiation protection training program is INPO certified. New training initiatives are in progress to sensitize management, workers and radiation protection personnel to assure they are aware of the need to minimize all occupational radiation exposure. Examples include training of management on ALARA for plant design changes and providing radiation awareness training to maintenance and operations personnel.

Licensee audits and assessments of program implementation and adequacy have improved. The audits and assessments, augmented by supervisory and management tours, have been generally adequate in following program implementation and identifying weaknesses, particularly toward the end of the period. Technical specialists are used to augment the QA audit teams. Additional QC surveillance of problem areas (e.g., High Radiation Area key control) has been implemented. However the scope of licensee audits have been principally compliance oriented. There is little external review of program adequacy and performance relative to the industry.

In the area of Internal Exposure Controls, no significant individual exposure of personnel during the period was identified. Also, during the major plant decontamination operation, exposure of workers to airborne radioactive material was well controlled. Approximately 90% of the station is now accessible in street clothes. Licensee quantification of radionuclides contained in the NRC whole body counting phantom was good. The use of sensitive whole body counting equipment combined with a capability to analyze the data reflects an adequate bioassay capability. Although performance in the area of Internal

Exposure Controls has improved, NRC review identified instances where about 1000 individuals had terminated from the site during the period without receiving confirmatory whole body counts. These termination body counts are not required by the NRC but are a normal good practice at most reactor sites and are recommended by Pilgrim site procedures. When brought to the licensee's attention they were unaware of the magnitude of these exceptions to the recommended practice, reflecting some weaknesses in oversight of this area.

During the assessment period three violations occurred which involved improper control of High Radiation Areas. Although no unplanned exposures resulted, when examined individually, these violations clearly reflect one or more of the previous assessment period concerns. In response, the licensee made certain short term corrective actions and established a task force to review the concerns and develop long term corrective actions. The licensee corrective actions for the most recent High Radiation Area access control concerns were appropriate, however, these corrective actions were prescribed by memorandum. The NRC has previously expressed concern regarding implementation of regulatory requirements by memoranda rather than by the use of formal, approved plant procedures. At the end of the assessment period, procedures were not yet revised to include these corrective actions. An additional weakness involved licensee attempts to resolve a concern with exposure reports in that, early in the period, NRC identified that the licensee had not sent a number of termination reports to individuals. The licensee instituted a corrective action program, but this matter is still under NRC review.

During the latter part of the assessment period, control, oversight and coordination of in-plant activities by the radiation protection department had significantly improved. The number of licensee technicians and first line supervisors was increased. Coincident with this staffing increase, licensee management selectively reduced contractor work force, keeping the most competent performers. The augmentation of first line supervisors combined with the elimination of a large number of contract technicians resulted in improved management control and accountability within the department.

In the area of radiation exposure, Pilgrim Station collective worker doses, calculated as 5 year rolling averages, have historically been among the highest in the nation. Some improvement was noted in the previous assessment period after a well documented ALARA program was instituted accompanied by a high visibility exposure goals program. Licensee activities during this period resulted in a collective worker dose (1580 person-rem) which was the highest of all domestic power reactors in

1987. Analysis by station management attributes the exposures to an expanded work scope during the prolonged outage with about 20% due to unplanned rework, poor contamination controls, and poor planning. Also, the large number of workers (about 2000) on site during the outage coupled with the high radiation source terms and poor work habits in the plant contributed to the high annual dose. During the initial part of this assessment period, NRC concerns included lack of understanding of day-to-day work activities due to poor maintenance planning and inaccurate description of work provided to radiation protection personnel which is incorporated into RWPs. Also, RWPs continued to be requested for work that was not performed. Improvements in this area were noted during the latter half of this assessment period.

Management efforts instituted to control exposure included hiring a large contractor staff to implement ALARA on the job, assigning six HP/ALARA coordinators to work groups, and implementation of dose saving techniques recommended by the ALARA Committee. The effectiveness of the six coordinators was particularly evident in the areas of maintenance and operations. For example, the use of glove bags to contain contamination during maintenance has been expanded. Contamination "spill drills" are routinely conducted to prepare operations personnel for dealing with future incidents so that the spread of contamination can be minimized.

NRC review of the selected ALARA goals indicated that they appeared to not be challenging and there was no formal mechanism to incorporate ALARA principles during the design of plant modifications. For example, during the outage the licensee was noted to have rebuilt a number of large valves (e.g., RHR System) without considering the need to reduce stellite, a major source of cobalt. During the latter part of the assessment period, the licensee was attempting to formalize a program to conduct ALARA reviews of plant design modifications during the conceptual design phase. A goal of 600 person-rem was initially planned for 1988 even though most of the outage work ended in February and a lower goal appeared achievable based upon anticipated radiological work. In addition, there was no long range planning evident to reduce the high general area dose rates at the station.

Radiological Environmental Monitoring Program

Midway through this assessment period an inspection of the licensee's radiological environmental monitoring program (REMP) was conducted. The REMP is administered by the corporate Radiological Engineering Group. The licensee's REMP conforms to Technical Specification requirements. The licensee has made plans for improvement of the annual REMP reports, and improvements to the meteorological monitoring program even though the licensee's Technical Specifications contain no requirements in this area. In response to a program weaknesses identified by the NRC during the last assessment period, the licensee has eliminated the environmental thermoluminescent dosimeters TLD system which was in use during the previous assessment period and is now using TLDs supplied by the Yankee Atomic Environmental Laboratory. Planned personnel expansion in this area is indicative of the licensee's commitment to continued improvement of the REMP.

Transportation

One inspection of the licensee's transportation program was conducted midway through this assessment period. Two Severity Level IV violations were identified. Both violations related to shipments made during the previous assessment period. These violations suggested inattention to technical detail and quality control in the preparation of radioactive shipment records. However, during this assessment period the licensee increased quality control involvement in processing, preparation, packaging and shipping of solid radioactive waste. This indicated the licensee's clear understanding of issues relating to causes of the problems and, in addition, the implementation of corrective action. The licensee is meeting all commitments to the NRC with regard to training in this area. The licensee has implemented procedures which clearly define the roles of the departments involved in solid radwaste and transportation. Procedures for processing, preparation, packaging, and shipping solid radwaste were adequate.

Summary

In summary, there was an overall improvement in licensee Radiation Protection Program adequacy and performance, particularly during the last quarter of the assessment period. However management attention is still required to exceed minimum regulatory requirements in the in-plant radiation protection program. Communications and working relationships have improved. Facilities and equipment have been upgraded. Limited success in 1) upgrading the ALARA Program performance, 2) staff qualifications and stability, and 3) aggressive long term corrective actions for High Radiation Area access control were noted.

In contrast, licensee performance in the areas of REMP and transportation reflects substantial improvement. These areas, if rated separately, would receive the highest performance rating category. Previous weaknesses regarding radiological effluent technical specification surveillance and the environmental TLD program have been corrected and plans made for additional program improvements. The station has substantially upgraded quality control activities in the transportation area.

(2) Conclusion

Rating: 3.

Trend: Improving.

(3) Recommendations

Licensee: 1. Continue strong senior management involvement in the in-plant radiation protection program.

2. Strengthen the ALARA program and complete training on program implementation.

NRC: 1. Conduct a management meeting with the licensee to review radiological program status and ALARA program progress.

4.3 Maintenance and Modifications (2347 Hours/24 percent)

(1) Analysis

This functional area is intended to assess the licensee's performance in planning and implementing the station maintenance program, and in implementing and testing plant modifications. The adequacy of modification design is evaluated under the Engineering and Technical Support functional area. This SALP period includes the results of the April 25 - May 5, 1988 NRC Maintenance Team Inspection. It does not include evaluation of the licensee's Restart Readiness Self Assessment, nor does it evaluate the licensee's response to the Maintenance Team Inspection findings.

During the previous SALP period, plant maintenance performance was assessed as a Category 2 . Maintenance staffing was weak due to first line supervisory vacancies and lack of direct professional support, hampering programmatic improvements The scheduling of "A" priority maintenance was good, however lower priority maintenance scheduling was weak as demonstrated by the large maintenance backlog. This was particularly evident in the areas of fire protection and security, resulting in equipment unavailability. The maintenance planning group was effective in validating maintenance requests (MR), but was only marginally effective in planning daily maintenance activities. Maintenance program procedures were considered weak and contained only minimal information. No administrative guidance for the newly formed planning and procurement groups was in place, hampering their integration into the process.

During the current SALP period maintenance and modification activities were routinely monitored. Also seven special inspections were conducted to evaluate the licensee's maintenance and modification control programs. An Augmented Inspection Team and a special electrical system team inspection also evaluated aspects of maintenance program effectiveness. Near the close of the SALP period a special maintenance team inspection evaluated the licensee's effectiveness in implementing the program.

Licensee efforts to improve facility material condition during this assessment period have been highly evident. Overhauls of major plant equipment such as the Residual Heat Removal pumps, High Pressure Coolant Injection pump, and feedwater pumps were successfully completed. Commitment by senior licensee management to perform these and numerous other equipment overhauls is a positive indication that material improvement has been a licensee priority.

The maintenance section also provided strong support during the November, 1987, extended loss of offsite power recovery effort. The Maintenance Section Manager held meetings to ensure directed and coordinated efforts of the work force and developed plans for an organized approach. Inspector observation of maintenance task performance in the field indicates that workers are adequately trained in that they are generally knowledgeable of assigned activities and their impact on the plant.

Senior licensee management has acted to increase allocated maintenance staffing, however staffing levels remained a weakness during much of the period. The significant burden of outage activity combined with this weakness continued to delay the progress of program enhancements. Early in the period, first line supervisory vacancies resulted in a reduction in oversight of field activities. Qualified licensee personnel did not apply for the positions. The licensee aggressively recruited individuals from outside the organization and filled the vacancies. Three maintenance staff engineer positions were created and filled in an effort to provide maintenance department technical support.

These individuals concentrated largely on completion of outage tasks and therefore were not available to develop longer range maintenance program improvements. Late in the period the Maintenance Section Manager and both the Electrical and Mechanical Division Manager positions became vacant. The licensee filled these three vacancies immediately after the close of the SALP period. Turnover and difficulty in recruitment of in-house personnel continues to be a significant problem at the maintenance supervisor level. The licensee compensated for two of these vacancies by using contractors. These continuing supervisory staffing vacancies combined with maintenance management turnover resulted in a lack of stability and consistent direction in the maintenance organization.

Communications between the maintenance department and other organizational entities has improved significantly. Early in the SALP period poor communication between the maintenance, radiation protection and operations departments resulted in a large number of radiation work permits requested but not utilized, and processing of equipment isolations for maintenance activities which were subsequently delayed. Maintenance priorities were not always consistent with operational needs. To address these issues, licensee management assigned two experienced radiation protection technicians to maintenance to assist in job planning and to improve maintenance personnel appreciation of radiological considerations. Two senior reactor operators were assigned to provide direct input to the planning process, and to act as liason between operations and maintenance.

These actions resulted in substantial communications improvement, and more efficient processing of maintenance and modifications tasks during the latter part of the assessment period.

During the period the licensee continued to devote resources to the improvement of the planning and scheduling function. Staffing of the maintenance planning group was augmented by the addition of significant contractor support. At the close of the SALP period all maintenance planning staff positions had been filled, with five positions filled by contractor personnel. This group actively collected existing MRs and verified spare parts availability but was not effective in developing integrated maintenance schedules or ensuring consistent high technical quality in maintenance packages. Licensee management also created the temporary Planning and Restart Group to assist in establishing outage scope and schedules. The functions of this group were later incorporated into the permanent line organization under the Planning and Outage Manager. The Planning and Outage Group appeared to be increasingly involved in developing and tracking longer term work schedules by the close of the SALP period. Continued attention to developing and implementing effective maintenance schedules, and to improving the detail and quality of maintenance work packages is needed.

In the previous SALP period, a large backlog of low priority maintenance had resulted in inoperable fire protection and security equipment, and reductions in operational flexibility due to equipment unavailability. During this assessment period, the licensee has effectively focused attention on defining and processing this large backlog of work. Recent completion of the major outage activities allowed further reductions. Late in the period the licensee directed increased effort at improving general equipment condition. Management frequently toured the station, evaluating the effectiveness of these efforts. However, because of a lack of sensitivity caused in part by concentration on backlog reduction, less significant maintenance deficiencies and poor maintenance practices were not always promptly addressed. An example of this is the poor condition of station batteries identified during a NRC team inspection.

Several routine inspections and a maintenance team inspection near the end of the SALP period found that maintenance program procedures and work instructions continued to be a significant weakness. Work control and implementation practices were not clearly delineated in approved procedures or other directives as evidenced by the excessive delay in issuing the Maintenance Manual. Maintenance requests contained little detail of the as-found condition, repairs effected and post-maintenance testing performed. This hindered subsequent root cause evaluations and reviews. Instructions provided to maintenance technicians often were not sufficiently detailed to ensure proper performance of the task, and to document activities such as placement of jumpers or lifted leads. For example, a series of engineered safety feature (ESF) actuations were caused by lack of adequate instructions and planning of electrical relay replacements. There was also no effective process for management review of completed maintenance packages. A number of improvements had been implemented such as maintenance package checklists, worker prejob briefings and use of a temporary procedure to document lifted leads, but appropriate maintenance process procedures were not revised to reflect the changes. For much of the SALP period, actions taken in response to NRC concerns were directed at correcting problem symptoms and were not sufficiently comprehensive in nature. The licensee deferred the formal addressing of program weaknesses in this area and the application of interim improvements has been inconsistent and not wholly effective. Shortly after the assessment period, licensee attention to this areas intensified and major program improvements were initiated.

The licensee's post-maintenance test program was not clearly defined. No clear guidance for establishment of post-maintenance testing requirements existed. In one case MRs for extensive repair and retermination of electrical cables were designated as not requiring retest, even though the repairs disturbed numerous circuits upon which logic testing had previously been completed. Late in the period the licensee took action to strengthen the post-maintenance testing process and to create a matrix of testing requirements.

The licensee implemented several aggressive maintenance initiatives directed at improvement of component performance. Preventive maintenance on all safety-related motor operated valves (MOV) and AC circuit breakers was completed. However MOV procedures were found to be weak in some areas. Circuit breaker maintenance was not extended to include any safety-related DC circuit breakers until prompted by the NRC, even though none had been performed during the life of the plant. While management commitment is evident, follow through on initiatives was occasionally incomplete. The increasing involvement of the Systems Engineer Group has had a positive impact on maintenance performance, particularly the quality and promptness of maintenance problem root cause analysis. The licensee also significantly increased staffing, training and management direction of the Station Services Group resulting in improvements in the station decontamination and housekeeping programs.

The licensee has implemented a Material Condition Improvement Action Plan (MCIAP) which identifies many of the weaknesses described above. An independent monitoring group was established by the licensee to monitor its effectiveness. This plan is intended to result in significant maintenance program improvements over the long term. The hardware aspects of the MCIAP were effectively addressed, however, program and procedural enhancements were deferred. The licensee also implemented a maintenance performance indicators program. This program has assisted licensee maintenance management in better focusing on adverse trends and department performa....

As a result of good working relationships between the Site Engineer Group and the Modification Management Group, licensee control of modification implementation and turnover was strong. A large number of complex modifications were completed during the period without significant problems. The program for controlling post-modification testing was generally effective. However, technical review of post-modification test procedures was occasionally inadequate. Examples of this included the failure of testing to identify the incorrect installation of reactor water level instruments, and the approval of several tests which either caused or would have caused unanticipated ESF actuations.

In summary, the licensee continues to give high priority to improvement of plant material condition, although program weaknesses in several areas were evident. The licensee implemented informal process enhancements which resulted in more rapid improvement during the last months of the SALP period. A long range plan, the MCIAP, has been established to promote program improvements in the areas of identified weakness. Licensee senior management attention to full and timely implementation of this plan is necessary to assure that permanent improvements are achieved. Staffing problems and management turnover however, need to be resolved so that these problems do not continue to hamper licensee efforts.

(2) Conclusion

Rating: 2

Trend: Not Assigned

(3) Recommendations

Licensee:

- Complete implementation of program improvements and continue staffing efforts.

- Provide for staff continuity and development.

NRC: None.

4.4 Surveillance (1386 hours/14 percent)

(1) Analysis

The surveillance functional area is intended to assess the effectiveness of licensee management in assuring the development and implementation of a comprehensive surveillance testing program.

During the previous SALP period, surveillance was assessed as a Category 3. Testing was generally conducted in a careful, safety conscious manner, however no centralized management of the surveillance test program existed. Responsibility for program management was not clearly established. The system for control of surveillance scheduling was weak, principally because the key individual involved with this activity was not a technical staff member. The technical adequacy of surveillance procedures and the control of measuring and test equipment (M&TE) were also found to be inadequate. The licensee's surveillance test program had not received adequate management attention.

During this SALP period surveillance testing was routinely observed and procedure technical adequacy was evaluated. One management meeting and several inspections were conducted to assess licensee efforts to correct the previously identified problems. An Augmented Inspection Team dispatched in response to a loss of offsite power also evaluated aspects of surveillance program effectiveness.

During the previous assessment period, the absence of strong centralized control and responsibility for surveillance program oversight contributed to continuing weaknesses. Early in this SALP period the licensee assigned responsibility for program maintenance and upgrade to the Technical Section Manager. The Systems Engineering Group within the Technical Section has become increasingly involved with development of program improvements. A Surveillance Coordinator position was established and staffed by a senior systems engineer to help provide needed focus. In addition, a coordinator was assigned in each department responsible for surveillance test performance. Allocation of these resources has resulted in acceleration of program improvements and is an indication of management commitment.

The licensee has taken action to improve the technical adequacy of surveillance test procedures. Technically inadequate test procedures were a recurring problem identified during previous SALP periods, requiring repeated NRC initiatives to obtain licensee corrective action. During the current assessment period however, the licensee implemented an extensive effort to evaluate and upgrade surveillance procedures. A team composed of licensee Nuclear Engineering Department, Technical Section and Maintenance Section representatives was formed to address the problem. Initially the effort was intended to assure compliance with technical specifications. Licensee management expanded the upgrades however, to include testing of additional system design features beyond technical specification requirements. This is an indication of the licensee's desire to establish a more comprehensive program that goes beyond regulatory requirements. Implementation of the improved testing allowed the licensee to identify and correct several system performance problems. Another example of the licensee's intent to thoroughly test major systems was the use of a temporary boiler to perform extensive testing of the High Pressure Coolant Injection and Reactor Core Isolation Cooling systems with non-nuclear steam. While substantial progress has been made, and existing procedures have been upgraded sufficiently to assure compliance with the Technical Specifications, some procedural weaknesses continue to be noted. For example, the inoperability of an emergency diesel generator during a loss of offsite power could have been prevented if surveillance procedures had recorded and evaluated more than the required minimum instrument readings. Additionally, inadequate test procedures have caused unnecessary engineered safety features actuations.

The licensee began development of a new computer-based Master Surveillance Tracking Program (MSTP) in an attempt to resolve previously identified scheduling problems. Considerable licensee effort was expended on development of the new program. However, late in the SALP period the licensee concluded that it was not viable due to problems with vendor-supplied computer software. The licensee's Systems Engineering Group has initiated an interim manual tracking system, and is revising the previously used MSTP to compensate for the identified weaknesses. Substantial time was expended in the unsuccessful attempt to implement the new MSTP, and therefore final resolution of the scheduling problems has not been reached. However, it is evident that licensee management is committed to improving the system, responsibility for implementation has been established and progress is being made.

The licensee's program for control of Measuring and Test Equipment (M&TE) has improved significantly. The licensee dedicated four full-time individuals to the upgrade of the M&TE control program. Instruments were collected, assigned unique identification numbers and data was input to a computer-based tracking system. Control and implementation of the local leak rate test program have also improved since the last assessment period. The significant improvement in these areas is a clear result of management involvement.

Licensee personnel generally conducted testing in a careful, safety conscious manner. Major testing evolutions such as the reactor vessel hydrostatic test and the containment integrated leak rate test were well coordinated and executed. Occasional personel performance lapses in the quality of testing were noted, however. For example, instrument and controls technicians failed to enable equipment sump level switches after calibration, causing sump overflow in the high pressure coolant injection pump room. During a similar drain system overflow incident operators did not perform required shiftly plant tours. As a result contaminated water was allowed to accumulate. These instances may indicate some weakness in personnel training.

The inservice inspection (ISI) program was effectively implemented. The licensee's ISI staff demonstrated a good understanding of technical issues. Management support of the ISI program is evident. For example, prompt action was taken to evaluate piping errosion and drywell liner corrosion in response to industry events.

In summary, the licensee has established appropriate responsibilities for management of the surveillance program. Sufficient senior management and technical resources have been allocated to affect the needed program improvements. Program responsibilities have been defined and assigned to the System Engineering Group. Test procedure technical adequacy and control of M&TE were substantially improved in response to recurring NRC concerns. While strengthening of surveillance scheduling has been slowed due to computer program problems, progress is currently being made. Continued licensee management attention is necessary to assure implementation of ongoing improvements, aggressive evaluation and correction of remaining weaknesses and reinforcement of newly established work standards.

(2) Conclusion

Rating: 2

Trend: None Assigned

(3) Recommendations

Licensee: Continue positive initiatives to upgrade surveillance procedures and impliment improved surveillance tracking programs.

4.5 Fire Protection (493 hours/5 percent)

(1) Analysis

This functional area is intended to assess the effectiveness of the licensee's station fire protection program, and the adequacy of modifications and procedures established to ensure compliance with 10 CFR 50 Appendix R. During the last period this area was rated as a Category 3. The fire protection program suffered from a chronic lack of management attention. The licensee was not aggressive in maintaining the operability of station fire protection equipment, resulting in heavy reliance on compensatory measures. Fire barrier surveillance procedures were unclear and incomplete. Personnel performing fire watches and serving on the fire brigade were poorly trained. Licensee senior management had taken steps at the end of the period to strengthen the program.

During this assessment period routine inspections monitored the progress of licensee improvement efforts, additionally two inspections were conducted to assess the status of the station fire protection program. In addition, a team inspection was performed to evaluate licensee compliance with 10 CFR 50, Appendix R. A management meeting was also held to discuss fire protection and Appendix R concerns.

The licensee demonstrated a high level of management involvement in ensuring fire protection and Appendix R program improvements. A fire protection group was established near the end of the last SALP period. During this period, staffing for the group was increased from one fire protection engineer to six permanent fire protection specialists. Frequent meetings with the fire protection group leader, and periodic status reports assisted senior licensee management in monitoring the group's progress. In the area of Appendix R the licensee established a temporary project management organization. A senior project engineer was dedicated to provide focused oversight and support. The Appendix R project organization and the fire protection group worked closely together to coordinate activities.

The licensee has been successful in reducing the backlog of fire protection equipment maintenance, which had contributed to a heavy reliance on compensatory measures. Fire protection group and maintenance managers worked effectively together to reduce the outstanding maintenance backlog, and to maintain it at a manageable level. Total outstanding fire protection maintenance was reduced from over 300 items to less than 50 items, and is currently tracked by licensee management as a performance indicator.

The control and quality of fire brigade training have improved. The fire protection group, with the assistance of the training department, developed and implemented a more comprehensive training program. A state certified instructor was hired to conduct the brigade training. The number of fire brigade drills conducted has substantially increased, and it appears that their effectiveness has improved. Through these actions the licensee has succeeded in developing a large core of trained personnel to serve as fire brigade members. Effective interaction and coordination between the fire brigade, the operations staff and local fire fighting companies was evident during several minor fire incidents occuring during the period, including a fire in the machine shop which prompted declaration of an Unusual Event.

The licensee initiated, and the NRC has approved several fire protection licensing actions during the assessment period. In response to past instances of problems with fire barrier adequacy, the licensee's Appendix R project organization implemented a well conceived program to identify, inspect and repair plant fire barriers. These inspections resulted in the identification of a significant number of deficient barrier seals. Licensee management exhibited a conservative philosophy, establishing compensatory fire watches for all plant barriers pending completion of inspections.

The licensee's approach to maintaining safe shutdown capability was found to assure redundant safe shutdown system train separation, and to provide sufficient operational flexibility. To assure adequate separation the licensee performed a well documented and thorough analysis, although procedures for use of the safe shutdown equipment, and operator training in this area were found to be weak. The licensee has taken action to resolve these weaknesses and has committed to demonstrate safe shutdown capability by performing a test during the power ascension program.

In summary, licensee management has taken strong action to establish and staff an effective station fire protection organization. Significant improvement in fire protection equipment material condition and fire brigade training has resulted. Licensee response during this SALP period to Appendix R issues, particularly fire barrier seal problems, was prompt and effective. Continued management attention is needed to assure prompt completion of fire barrier seal repairs, to achieve further reduction of outstanding compensatory fire watches and to provide a stable effective fire protection program.

(2) Conclusion

Rating: 2

Trend: None Assigned

4.6 Emergency Preparedness (176 hours/2 percent)

(1) Analysis

During the previous assessment period, licensee performance in this area was rated Category 2. This was based upon a renewed commitment by management for emergency preparedness and a significant improvement in performance.

During the current assessment period, one partial participation exercise was observed, two routine safety inspections were conducted, one special safety inspection specifically related to emergency classification was conducted, and changes to emergency plans and implementing procedures were reviewed.

Two routine safety inspections were conducted in November, 1987 and January, 1988. These inspections examined all major areas within the licensee's emergency preparedness program. During the November, 1987 inspection, significant changes were examined regarding the normal emergency preparedness organization. These changes resulted in essentially a completely new organization with the Emergency Preparedness Manager reporting to the Senior Vice President. Functional responsibilities are divided into on-site and off-site areas with coordinators for each. The licensee has filled the managerial positions, as well as other working positions, with personnel experienced in emergency preparedness. In addition, the licensee has contracted with several consultants to help the permanent staff.

During the January, 1988 inspection significant changes were examined regarding the Emergency Response Organization (ERO) and Emergency Action Levels (EAL's). The licensee has committed to a complete restructuring of the ERO with a three-team duty rotation. Additionally, the licensee is revising the EAL's to be symptomatic, address uman factors, and has integrated them with the Emergency Operating Procedures. Significant facility changes made include the addition of a Computerized Automated Notification System to notify the ERO.

A partial participation exercise was conducted on December 9, 1987. The licensee demonstrated a satisfactory emergency response capability. Actions by plant operators were prompt and effective. Event classification, and subsequent Protective Action Recommendations, were accurate and timely. Personnel were generally well trained and qualified for their positions. No significant deficiencies were identified. Several minor weaknesses were noted including insufficient depth in some positions to support prolonged operations, dose projection discrepancies, delays in fielding onsite repair teams, and weak initial notification forms.

During the response to a loss of offsite power event in November, 1987, some weakness in coordination and communication between licensee groups was noted. While not required by the site emergency plan, the licensee eventually chose to partially activate the Technical Support Center (TSC) to aid in recovery efforts. The difficulties experienced by the licensee during the initial response and subsequent efforts to utilize the TSC indicate that licensee attention to preplanning response options to non-emergency events, such as discretionary activation of the TSC, may be appropriate.

During the February, 1988 inspection the licensee's actions in response to a declaration of an Unusual Event were examined. The licensee's classification was conservative and prompt. Mitigation activities were effective. The licensee identified several problems associated with their actions including: failure to completely follow procedures; untimely notification of event termination; and control room distractions due to the large volume of outside communications. The licensee promptly identified these issues and instituted appropriate short-term and long-term actions to prevent their recurrence.

The licensee is continuing to work closely with local and Commonwealth of Massachusetts officials to upgrade off-site emergency preparedness. The licensee has a large organization working on plan and procedure development, in conjunction with the appropriate local and Commonwealth agencies.

During this period, the licensee was granted exemptions for the 1987 full participation exercise and a deferral of the submittal of public information. These were based on the Commonwealth of Massachusetts requests to complete the local and Commonwealth emergency plans, implementing procedures and associated training prior to issuance of public information or demonstration of capabilities.

In summary, the licensee has demonstrated a commitment to emergency preparedness. Management involvement is evidenced by the major on- site program changes being supported, commitment to the offsite level of emergency preparedness, and by timely recognition of problems and subsequent corrective actions. The licensee has been responsive to NRC concerns and is continuing to make progress in these areas.

(2) Conclusion

Rating: 2

Trend: Improving

4.7 Security and Safeguards (641 hours/7 percent)

(1) Analysis

This functional area was rated as a Category 3 during the previous assessment period. NRC identified serious concerns regarding the implementation and management support of the security program. The licensee's proprietary security staff consisted of one full time and one part time member, resulting in weak oversight of the contractor. In addition, inoperable equipment contributed to a heavy reliance on long term compensatory measures. Contractor security force overtime was also poorly controlled. Toward the end of the assessment period, the licensee initiated actions to correct the problems. However, at the conclusion of the rating period the hardware upgrades were not complete and the expanded proprietary security staff organization had not been in place for an adequate time for NRC to evaluate its effectiveness.

Four routine, unannounced security inspections, one special security inspection, and one routine unannounced material control and accounting inspection were performed during this assessment period by region-based inspectors. Routine observations were also conducted throughout the assessment period.

During this assessment period, the licensee aggressively pursued a planned and comprehensive course of action to identify and correct the root causes of the previously identified programmatic weaknesses in the area of physical security. To improve the overall performance of the security organization and the security program the licensee implemented several significant actions, including a commitment by senior management to support and implement an effective security program; establishment of a licensee security management organization on-site to direct and oversee program implementation; upgrading unreliable systems and equipment to eliminate the previous heavy reliance on compensatory measures that were manpower intensive; and revising the Security, Contingency and Training and Qualifications plans, and their respective implementing procedures, to make them current and clearer.

The licensee's security management organization is now headed by a section manager who reports to the Plant Support Manager, under the Station Director. Assisting the Security Section Manager are five supervisors with specific functional areas of responsibility (operations, administration, technical, compliance and access authorization) and a staff assistant. Additionally, there are seven licensee shift supervisors who are responsible to monitor the performance of the contract security force around-the-clock. This represents an overall increase of seven supervisors over those which were in place at the end of the last assessment period, and thirteen over that which was in place when the plant was shut down in April, 1986. (At that time there was one supervisor who reported to a group leader with other, concurrent duties.) The licensee also established a full-time corporate security position onsite. The incumbent is responsible to audit the security program on a continual basis and to provide another perspective on its implementation. In addition, the licensee established, as supervisory personnel, the alarm station operators employed by the security force contractor, and significantly improved the supervisor-to-guard ratio. This expansion of the licensee's security organization represents a significant allocation in terms of resources and provides evidence of senior management's commitment to the program.

In addition to the organizational expansion, considerable capital resources were expended throughout the assessment period to upgrade, by modification or replacement, security systems and equipment. The entire protected area barrier, assessment system, intrusion detection system and protected area lighting were significantly improved. These improvements began early in the assessment period and were, for the most part, complete at the end of the period with only minor fine tuning of the new systems and equipment still required. Additional upgrades in access control equipment and the security computer are scheduled. The improvements have already resulted in a sizable reduction in the number of compensatory posts and, therefore, a reduction in the contract guard force. The above mentioned upgrades permitted the guard force to go on a 40 hour work week rather than the 60 hour work week required during the major portion of the assessment period. In addition to the improved systems and equipment, the licensee has taken action to strengthen the security equipment corrective maintenance program and has initiated action to establish a preventive maintenance program to further ensure the continued reliability of security systems and equipment. Open maintenance requests for security equipment are also now tracked as a performance indicator by plant management. These actions and initiatives are further evidence of senior management's commitment to the program.

During the assessment period, the licensee submitted six changes to the Security Plan under the provisions of 10 CFR 50.54(p). One of these changes was a complete revision to upgrade the Security Plan and to revise the format to be consistent with NUREG 0908. In conjunction with the Security Plan upgrade, the licensee also submitted revisions to the Safeguards Contingency Plan and the Security Force Training and Qualification Plan (complete revisions of these plans were submitted during March, 1988). The complete plan revisions were comprehensive, more consistent with current NRC regulations, and provided clearer documents from which to develop and modify implementing procedures. The plan changes were adequately summarized and appropriately marked to facilitate review. Further, the licensee, prior to submitting the changes, communicated with the NRC by telephone and requested meetings in Region I and onsite to ensure that the changes were appropriate, clearly understood, and in compliance with NRC regulations.

Audits of the Security program conducted by Corporate Security personnel and the onsite QA group during the assessment period were found to be very comprehensive and corrective actions were found to be prompt and generally effective, indicating a much improved understanding of program objectives. Because of the security program weaknesses identified toward the end of the previous SALP period, the licensee assigned to the site, on a full-time basis, a member of the corporate security staff with responsibility for conducting continued surveillance and audit of the program. That initiative was reviewed and found to be a very effective management tool to provide an independent assessment of the day-to-day implementation of the security program and another input to the overall security program upgrade project.

The security force training program appears to be adequate to address the activities of the security organization. The licensee has taken actions to assure the training program remains current and reflects the changes and upgrades to the security program. For example, to ensure more comprehensive management oversight by licensee security shift supervisors, each received plant operational technical training in addition to security program and other training. This training enables these supervisors to be more effective in interfacing with other plant technical functions.

There were three apparent violations identified by the NRC during this assessment period. All of the violations were the result of degraded vital area barriers. The licensee was notified of the apparent violations and an enforcement conference and a subsequent management meeting were held. These apparent violations resulted from weak communications between the security and maintenance organizations, and a poor appreciation by maintenance personnel of security requirements. Corrective actions were implemented by the licensee and they appear to be effective.

A total of six security event reports required by 10 CFR 73.71(c) were submitted to the NRC during this assessment period. Three event reports were necessitated by the licensee's findings of degraded vital area barriers. Similar degradations were also reported in the previous assessment period. Two of the degradations reported during this period were the result of maintenance work being performed on plant systems that penetrated the barriers. The other resulted from a degraded vital area door. Another event report was necessitated by the reclassification of an area of the plant as vital. The need for reclassification was identified as a result of the licensee's Vital Area Analysis and Barrier study. Another event report involved a guard leaving his weapon unattended The sixth event report involved the loss of a set of security keys by a member of the guard force. With the exception of the vital barrier degradations earlier in the assessment period, no adverse trend was indicated by the events which occurred during this assessment period. The licensee eventually implemented appropriate measures to prevent recurrence of the vital area barrier degradation problems. The quality of the event reports was significantly improved over the previous assessment period indicating a better understanding of program objectives and more care in their preparation. They were clear, concise and contained sufficient information to permit NRC evaluations without the need for additional information.

The licensee's program and procedures for the control and accounting of special nuclear material were also reviewed during this assessment period and were found to be adequate and generally well implemented.

In summary, the licensee has demonstrated a commitment to implement an effective security program that goes beyond minimum compliance with NRC requirements. As a result of this commitment, the licensee security organization has been expanded, significant capital resources have been expended to upgrade security hardware, and equipment and program plans have been improved. Continued senior management support and involvement in the security program is necessary to ensure that the momentum demonstrated during this assessment period is continued.

(2) Conclusion

Rating: 2

Trend: None Assigned

4.8 Engineering and Technical Support (1215 Hours/13 percent)

(1) Analysis

This functional area is intended to assess the adequacy of the licensee's technical and engineering support in the areas of plant design changes, routine operations and maintenance activities. Engineering and Technical Support was assessed as a Category 1 during the previous SALP period. Good engineering support to the site was noted in the Environmental Qualification program and the design of several significant plant hardware modifications. Technical evaluations were typically thorough and demonstrated an adequate regard for safety. The engineering approach to the Safety Enhancement Program (SEP) demonstrated an excellent appreciation for underlying safety issues. A weakness in the lack of detailed design basis documents for plant equipment was also noted during the last period.

During this assessment period, five special inspections including an Augmented Inspection Team focusing on a loss of offsite power event, an electrical system team inspection, and a maintenance team inspection were conducted and, in part, evaluated the licensee's performance in this area. The effectiveness of the onsite Systems Engineering Group, and the Nuclear Engineering Department's (NED) interactions with the site organization were routinely monitored.

Significant plant modifications were installed during this assessment period, including the reactor water level instrumentation modification, a hydrogen water chemistry system, an analog trip system, and a new plant process computer. Few problems were identified with these projects, demonstrating the strength of the engineering work. Safety evaluations required by 10 CFR 50.59 for design changes and modifications were generally thorough and conservative. Safety evaluations for SEP modifications demonstrated sufficient analysis and supporting facts to conclude that there were no unreviewed safety questions. Highly qualified engineering staff and NED management focus on safety have contributed to the licensee's performance in this area.

Offsite technical and engineering support was generally good as indicated by the successful design and implementation of significant plant hardware modifications. Continued effective use of the Design Review Board was evident during this SALP period.

This was demonstrated by high quality initial design reviews, and routine evaluations of completed modifications for synergystic effects. The expanded Field Engineering Section, the design implementation oversight arm of NED, played a vital role in coordinating activities between the site organization and the NED. Engineering management was actively involved in implementation of modifications and addressing problems. The Safety Enhancement Program, including extensive Mark I containment and station blackout modifications, were planned and implemented during this period. The engineering approach to the Mark I issues went considerably beyond NRC requirements and demonstrated a good appreciation of containment reliability issues. The NED's involvement in the development of the new Emergency Operating Procedures (EOP) demonstrated significant management attention in this area. The licensee's communications with the NRC regarding the planning and implementation of the SEP and EOP projects were generally good. In addition to these modifications, the licensee is preparing an extensive Individual Plant Evaluation (IPE) as part of the (SEP) using probabilistic and deterministic analyses. In support of these efforts, the licensee effectively managed contract engineering expertise to produce quality design changes and analyses. Throughout the development and implementation of the SEP senior management's involvement and commitment to safety was apparent.

A team inspection was conducted during this assessment period to review the licensee's implementation of a fire protection program to meet the requirements of 10 CFR 50 Appendix R. The licensee's approach to maintaining safe shutdown capability was found to assure adequate redundant safe shutdown system train separation, and to provide sufficient operational flexibility. The licensee's analyses were found to be well documented and thorough. NED's Appendix R project organization and the onsite fire protection group worked closely together to coordinate activities.

Some weaknesses in the engineering design change process were noted. In one instance inadequate technical review of a design change by NED resulted in incorrect installation of reactor water level gauges. Additionally, the plant design change document for the Standby Gas Treatment System did not specify adequate post-work testing requirements. Further, as indicated in the previous SALP, the lack of detailed design basis documents was a continuing problem this assessment period. Examples included lack of seismic qualification documents for the reactor building auxiliary bay and for the hydraulic control units. Also, engineering failed to correctly translate containment accident temperature profiles into environmental qualification documents. However, the licensee has taken initiatives to further understand the design bases of the plant electrical distribution system as evidenced by the use of a new computer code to analyse electrical distribution equipment performance.

At times, corporate engineering support for plant maintenance activities was limited. The NRC special electrical system inspection identified that the DC battery and electrical breaker maintenance activities were not supported by NED. The licensee's initial response to the NRC's concern regarding the surveillance testing of the DC breakers was limited in scope and lacked engineering justifications on the sample size and the acceptance criteria.

The increasing involvement of the onsite Systems Engineering Group (SEG) has had a positive impact on the quality of operations event analysis, the surveillance test program, and on maintenance performance, particularly the quality of maintenance problem root cause analysis. At the beginning of the assessment period the licensee established the SEG under the Technical Section within the Nuclear Operations Department. The SEG was staffed largely with experienced contractors, but the licensee gradually expanded the group and replaced the contractors with permanent Boston Edison employees. At the end of this period, the SEG had a total technical staff of 26 including 15 senior systems engineers. The increasing involvement by the SEG has promoted better intergroup interactions as the operations and maintenance departments have begun to value and rely on the SEG's contributions.

In summary, overall strong engineering support continued throughout this period. Major plant modifications were completed with only a few minor problems, demonstrating the quality of engineering work. The increasing involvement of the SEG has contributed significantly to the quality of root cause analyses and in maintenance performance. However, overall performance in the areas of corporate engineering responsiveness and support to site maintenance initiatives appears to need further licensee evaluation and improvement. Additional management attention is needed in developing long-term programs to provide better operational and maintenance support to the site.

(2) Conclusion

Rating: 1

Trend: None Assigned

4.9 Licensing Activities

(1) Analysis

The licensing functional area is intended to assess the licensee's effectiveness in assuring a technically accurate and up-to-date licensing basis, and the licensee's responsiveness to NRC and industry concerns. During the previous assessment period licensing was evaluated as a Category 2.

During this period, the basis for this appraisal was the licensee's performance in support of licensing actions that were either completed or had a significant level of activity. These actions consisted of amendment requests, exemption requests, responses to generic letters, TMI items, and other actions.

The licensee has exhibited a high level of management involvement in major licensing initiatives; however more routine licensing actions did not always receive substantive management action. An example of a high level of management involvement and initiative is the licensee's actions to improve the Mark I containment and implement other plant safety improvements intended to cope with severe accidents as part of its Safety Enhancement Program (SEP). This program includes improvements to emergency operating procedures, modifications to containment spray nozzles, enhancements to water supplies that would be available in the event of a severe accident, the installation of a direct torus vent and the installation of a third emergency diesel generator. A number of the SEP modifications, such as the Station Blackout Diesel Generator are also useful in dealing with less significant transients and events as opposed to severe accidents.

The licensee is in the forefront of the industry in the effort to deal with severe accidents and has expended substantial resources on the SEP. The licensee has been very active in industry owner's groups involved in severe accident initiatives. Although much of the SEP effort did not involve direct licensing actions, the staff did assess the safety significance of the licensee's modifications and inspected portions of the modifications. The licensee is commended for its leadership on the SEP program. It should be noted that the staff is still continuing its assessment of some of the details of the SEP modifications.

The technical quality of more routine licensing actions (such as some Technical Specification amendments and exemption requests) has been sporadic. Several fire protection licensing actions have required numerous submittals and frequent interchanges with the staff. For example, the licensee revised its technical position twice in the determination of the appropriate basis for an exemption request involving the lack of 3-hour fire proofing for structural steel in the Reactor Building Torus Compartment. Several submittals were required, and the staff had to request detailed calculations to support the licensee's basis. In a technical specification change involving 10 CFR 50 Appendix J requirements (Amendment 113), the licensee had to make numerous submittals in response to staff concerns and was required to correct errors in previous submittals identified by both the staff and BECo. The staff identified inconsistencies in proposed changes to the technical specifications for the Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Amendment 112) and revised submittals by the licensee were required. The extensive activities and resources required to correct problems identified in Confirmatory Action Letter 86-10 and subsequent management meetings has apparently impacted the licensee's overall performance in the licensing area. These problems suggest a weakness in corporate management at the level that establishes priorities and coordinates engineering and licensing activities for the utility.

The licensee has, however, submitted, and the staff has approved, a number of technical specification changes or exemption requests that demonstrated a high level of technical quality and management involvement. Examples include the schedular exemption for conduct of the emergency preparedness exercise, Core Reload (Amendment 105), Control Rod Block Actuation (Amendment 110), and LPCI Subsystem Surveillance (Amendment 111). Where NRC staff requests for additional information were made, the licensee responses have been prompt and comprehensive.

The licensee has usually been responsive to NRC initiatives. The licensee has been responsive to staff requests to track and control actions of mutual interest between NRR and the utility. For example, the licensee has developed a tracking system to assist in the management of licensing actions and has provided extensive resources to support NRC effort in updating the Safety Information Management System (SIMS) data base. Particularly noteworthy was the high quality of technical support provided for the staff's review of Emergency Operating Procedures.

There was evidence of improvement during the latter portion of the SALP period in the approach to the resolution of technical issues and responsiveness to NRC initiatives in the licensing area. This is in part due to recent organizational changes which have resulted in a closer relationship of the licensing and engineering groups. The overall staffing to support licensing activities is adequate and its effectiveness should be improved by the recent organizational changes. Recently a reduction has been evident in the number of cases of technical errors, lack of clarity, and incomplete information.

In summary, the licensee has exhibited strong management involvement in several major licensing actions, but attention to more routine licensing actions has been inconsistent. The licensee has shown some improvement in the licensing area during the latter portion of the SALP period. The involvement of management in routine, as well as major licensing activities, is necessary. The continued strengthening of mid-level management and increased technical capability of licensing staff are necessary.

(2) Conclusion

Rating: 2

Trend: None Assigned

4.10 Training and Qualification Effectiveness

(1) Analysis

Technical training and qualification effectiveness is being considered as a separate functional area. The various aspects of this functional area were discussed and used as one evaluation criterion within the other functional areas. The respective inspection hours have been included in each one. Consequently, this discussion is a synopsis of those assessments. Training effectiveness has been measured primarily by the observed performance of licensee personnel and, to a lesser degree, as a review of program adequacy.

This area was rated as a Category 2 during the previous assessment period. The licensed operator training and requalification programs were found to be significantly improved. Assignment of knowledgeable staff had resulted in higher quality training materials, and more plant-oriented operator training. Maintenance, contractor and radiation protection personnel training were also adequate. Fire brigade and fire watch training had been significantly weak and contributed to poor personnel performance in the plant. Four of ten licensee training programs had received accreditation from the Institute of Nuclear Power Operations (INPO).

During this assessment period, inspectors routinely reviewed ongoing training activities and their effectiveness in assuring quality personnel performance. Two sets of reactor operator and senior reactor operator license examinations were administered. An inspection to evaluate the adequacy of the nonlicensed personnel training program was also completed. Various other inspections reviewed training provided in the areas of emergency preparedness, radiation protection, security, maintenance, fire protection and modifications.

Licensed operator training effectiveness continued to improve throughout the period. Two sets of licensed operator examinations were administered to a total of two senior reactor operators and fourteen reactor operators, with all candidates successfully completing the licensing process. Newly licensed operator familiarity with plant equipment and procedures was considered a strength. Challenges facing licensee management include completion of training for the large number of new, relatively inexperienced operators. Site management is intent on assuring that time spent by newly licensed operators in the control room during startup and initial operations, is used as effectively as possible to provide the maximum training benefit.

The material developed for operator training and submitted for NRC review was generally good. However, for the first examination early in the assessment period, it was noted that some materials provided to the NRC did not reflect recent station modifications. This was because the modifications had recently been completed and previous training had focused on the original systems. It was also noted during exams and by direct discussions with licensed operators, that training conducted on recently implemented modifications, such as on the reactor water level and automatic depressurization systems, had not been fully effective. Operators were unfamiliar with the modifications, primarily because only on-watch training had been performed and because the training had been conducted prior to completion of the modifications. Licensee management took prompt action to restructure the modifications training and committed to repeat the training prior to plant restart.

The licensee completed installation of a plant specific simulator during this assessment period, and used it extensively to enhance operator training, particularly in the area of emergency operating procedures (EOP). The licensee implemented a comprehensive EOP training program including a combination of simulator and classroom instruction. Licensee management assured the effectiveness of this training by performing post-training evaluation of the operating crews on the simulator. The development of special criteria by which acceptable performance is judged was a strong point of the EOP training program. Operator performance weaknesses were identified by the licensee, and supplemental training was performed to resolve the problems. Licensee management also initiated a communications training program for operations personnel. This communications training was implemented along with the EOP training and appeared to substantially improve operator performance.

Licensed operator performance during plant events such as a loss of offsite power, and an Unusual Event due to a fire in the machine shop generally demonstrated a good command of plant equipment and procedures. However, some apparent weaknesses in operator training were evident. For example, several operational errors were made during reactor refueling despite independent verification requirements. On several occasions operators failed to properly perform routine surveillances.

The nonlicensed and contractor personnel training program appeared effective. The training staff dedicated to this function has been supplemented by the addition of contractors. The licensee initiated maintenance and radiological technician apprentice programs to assist in development of qualified lower level personnel. New training initiatives are in progress to sensitize management, workers and radiation protection personnel to the need to minimize all occupational exposure. For example, management training in ALARA for plant design changes and radiation awareness training for operations and maintenance personnel have been initiated. In addition, a Training Program Evaluation Committee was established to assure plant management involvement in ongoing development of nonlicensed training.

The licensee's program for fire brigade and fire watch training has been significantly improved. The station fire protection group and the licensee's training department have coordinated to expand the scope and enhance the quality of brigade training. A large core of qualified fire brigade members has been established.

Security force, emergency response and maintenance training appeared to be effective. No performance deficiencies directly attributable to training were identified in these areas during the period. INPO accredidation of all remaining training programs was received during the current assessment period.

In summary, licensee management has been active in improving the overall quality of the training program and has been responsive to NRC concerns. Licensed and nonlicensed training programs are effectively implemented. Of particular value is the use of the simulator, and other initiatives such as formal communications training and establishment of an apprentice program. Efforts should be continued to strengthen operator training in the area of modifications and to ensure effective completion of training for newly licensed personnel.

(2) Conclusion

Rating: 2

Trend: None Assigned

4.11 Assurance of Quality

(1) Analysis

During this assessment period, Assurance of Quality is being considered as a separate functional area. Management involvement in assuring quality continues to be discussed and assessed as an evaluation criterion in each of the other SALP functional areas. The respective inspection hours are included in each one. Consequently, this discussion is a synopsis of the assessments relating to assurance of quality in other areas. Since this is an evaluation of management's overall performance it conveys a broader scope than simply Quality Assurance (QA) department performance.

During the previous assessment period this functional area was evaluated as a category 3. Licensee management had not been effective in addressing recurring SALP concerns. Organization and staffing were considered weak. Licensee management corrective actions in response to Quality Assurance (QA) findings and NRC issues had not been timely or comprehensive. QA department performance and engineering initiatives were considered a strength.

Quality Assurance effectiveness has been assessed on a day-to-day basis. Three inspections focusing on the Quality Assurance and Quality Control (QC) programs were conducted during this period. In addition, the large number of management meetings held during the period provided an opportunity for NRC management to assess licensee management's approach to resolution of issues.

During much of the period licensee senior management continued to assess and correct organizational weaknesses through restructuring and recruitment of experienced personnel, many from outside sources. A new Senior Vice President assumed responsibility for the nuclear organization at the beginning of the period. In June, 1987 the Vice President-Nuclear Operations resigned. That position remained vacant until January, 1988 when the Site Director position was created and filled. Station management was reorganized several times, and significant personnel changes were made. Four individuals served as plant manager during the fifteen month assessment period. In addition to modifying the line organization a temporary Planning and Restart Group was created, working in parallel with the permanent plant staff to provide outage planning oversight. This group was subsequently disbanded, incorporating its functions into the permanent organization. The licensee also replaced several mid-level managers during this assessment period including the Operations Section Manager, Maintenance Section

Manager, Radiological Section Manager and the Security Group Leader. In addition to changes in the line organization several staff assistant positions reporting to the Senior Vice President were established to enhance senior management oversight of organization progress. Although actions in this area were implemented slowly, it was evident that senior licensee management took a careful and deliberate approach to establishing the permanent organization and staff. Licensee management displayed the intent to fill open positions in the organization with the most highly qualified individuals available. This approach may have delayed staffing efforts and initially slowed licensee progress in areas such as maintenance and radiological controls.

Management policies and performance standards were strengthened and are clearly understood through mid-level management. However, the new standards were not concurrently communicated or adopted at the working level in some cases. As a result extensive management involvement in routine activities is still required to assure acceptable performance.

A high level of management involvement and commitment was effective in promoting improvement in several SALP functional areas which had previously been identified as significantly weak. This is particularly evident in the areas of fire protection and security where management acted to establish, staff and support expanded oversight groups. This strong commitment is also evidenced by the organization-wide increases in permanent staff, and the general reduction in reliance on contractors for augmentation of line functions. One exception to this is in the area of maintenance where vacancies and reliance on contractors continues.

Licensee response to new NRC concerns raised during the period was sometimes narrowly focused, and did not target resolution of root causes. For example, a high level of NRC management involvement was required to assure development of a comprehensive Power Ascension Test Program, and to resolve overtime control deficiencies. Needed programmatic improvements in the area of maintenance were only implemented after prompting by the NRC. This may reflect that available licensee resources were focused on areas of previously identified weak performance and on outage completion schedules. In some instances the licensee's written replies to NRC concerns have been vague, incomplete, and did not reflect the full extent of actions which had been taken at the acility.

The licensee initiated several programs designed to upgrade personnel and plant performance. The plant Emergency Operating Procedures (EOP) were upgraded, and extensive EOP and communication training was conducted to enhance operator response capabilities during abnormal and emergency conditions. A fitness-for-duty program was also instituted and applied to all licensee and contractor personnel. In addition, implementation of the Safety Enhancement Program and the station decontamination program improved the plant physical design and condition. The decontamination effort was particularly successful, resulting in increased accessability to plant areas and a general positive impact on personnel morale.

Licensee management took an active role in establishing long term plans to address identified weaknesses. The Restart Plan, the Material Condition Improvement Action Plan (MCIAP), and the Radiological Action Plan (RAP) are examples. In the case of the MCIAP a team of contractors was created to provide ongoing independent assessment of the plan's effectiveness in improving plant material condition and maintenance practices. In the area of radiological improvements the licensee reinstituted the Independent Radiological Oversight Committee to provide senior management with feedback on RAP effectiveness. The licensee also implemented a self assessment process near the close of the period. This self assessment was intended to provide a structured method by which licensee management could evaluate the progress made, and identify remaining weaknesses.

The licensee's Quality Assurance (QA) and Quality Control (QC) department continued to become more involved in station activities. The onsite QA surveillance group was increased in size, and appeared to be actively involved in evaluating field activities. QA audit methodology was revised to enhance its effectiveness, and an aggressive audit schedule was established. The licensee made good use of technical experts during audits to supplement available departmental resources. QA department management took prompt action to focus attention on significant concerns. For example, a stop work order was issued in response to adverse trends and findings in the area of maintenance on environmentally qualified equipment. Corporate and site management response to QA findings has also improved. Both the program controls and their application were strengthened to ensure timely response to QA identified deficiencies. Overdue response to these QA deficiencies are currently tracked as a performance indicator.

Throughout most of the assessment period, the licensee's corrective action process was not always effective. A large number of problem reporting devices exist, each with a unique origination, review and disposition process. This makes use of the corrective action system cumbersome, and weakens accountability for followup and closeout. Lack of clear problem descriptions, and delays between origination and followup, hampers establishment of root cause and implementation of corrective actions. The licensee has reviewed the process and recommendations to facilitate improvements have been made. However, the recommendations were not imolemented during this period.

In summary, licensee senior management has taken strong action to develop and staff a viable station organization. High quality personnel have been recruited to fill key management positions. The reorganization and staffing process was not completed until late in the SALP period. As a result, progress in some functional areas, and in forcing management philosopy changes down to the worker and first line supervisor level has been hampered. The continuing need for a high level of management participation in routine activities occasionally prevents managers from focusing on other needed program improvements. Overall, the licensee has been successfull in effecting significant performance improvements in many areas. A high level of management involvement is required to ensure that the initiated improvements continue and are sustained.

(2) Conclusion

Rating: 2

Trend: None Assigned

5.0 SUPPORTING DATA AND SUMMARIES

5.1 Investigation and Allegations Review

Twenty allegations were received during this SALP period. Eleven of the allegations were investigated and found either to be unsubstantiated or to be substantiated but of no safety significance. Five allegations were investigated and substantiated, however the licensee had either already instituted appropriate corrective actions or such actions were promptly initiated in each case. Four allegations are currently under review. One of these four concerns the licensee's program for control of overtime which is the subject of ongoing reviews.

One investigation was initiated during the assessment period as a result of an allegation regarding a plant security vital area barrier. This investigation is continuing.

5.2 Escalated Enforcement Action

Confirmatory Action Letter (CAL 86-10) was issued in response to a series of operational events in April, 1986. CAL 86-10 requested submittal of technical evaluations of these events and stated that NRC Regional Administrator approval would be required prior to restart. The technical issues identified in CAL 86-10 have been resolved. The CAL however was extended in August, 1986 and remains open pending resolution of broader management concerns identified in the previous SALPs and subsequent inspection reports.

Three violations were identified during the period for failure of the licensee to ensure the integrity of security vital area barriers. These three violations have yet to be characterized by severity level, and are currently being considered for escalated enforcement action. This action is pending conclusion of the OI investigation described in Section 5.1 above.

An NRC Order issued in 1984 requiring the licensee to implement a Radiation Improvement Program was closed during the period based on the results of a special inspection and other program inspections which indicated that all terms of the Order had been satisfactorily completed.

Request for Action Under 10 CFR 2.206

On August 21, 1987, the Director of the NRC Office of Nuclear Reactor Regulation signed an Interim Director's Decision in response to the July 15, 1986, 2.206 petition filed by Massachusetts State Senator William B. Golden and others. The contentions raised in the petition regarding containment deficiencies and inadequacies in the radiological emergency response plan were denied. A decision regarding the management deficiencies was deferred to a subsequent response. Three of the petitioners filed an appeal in federal court on October 1, 1987.

On October 15, 1987, Massachusetts Attorney General James M. Shannon filed a 2.206 petition, on behalf of his office and Governor Michael S. Dukakis, requested an order to show cause why Pilgrim should not remain shutdown until a full adjudicatory hearing resolves the issues raised in the petition. The petition cites evidence of continuing managerial, Mark I containment, and emergency planning deficiencies. An interim NRC response was issued on May 27, 1988, just after the end of the SALP period.

5.3 Management Conferences

Periodic management conferences and plant tours were conducted throughout the SALP period. NRC Commissioners toured the plant and met with licensee management on six occasions during the period. A total of nine senior management conferences were held onsite or at Region I. In addition to plant tours held in conjunction with onsite management conferences, senior NRC managers performed two plant inspections during the assessment period. NRC management participated in four public meetings in the vicinity of the plant. Two of these public meetings were sponsored by the NRC and two by local communities. Five meetings with state officials and legislative committees were attended by NRC managers. The NRC also testified before the United States Senate Labor and Human Resources Committee regarding Pilgrim at a public hearing held in Plymouth, MA in January, 1988. A chronological list of NRC management meetings and plant tours conducted during the assessment period is contained in Table 5. In addition, a summary of licensing meetings has been included in section 5.4(1).

To coordinate the planning and execution of NRC activities and to assess the results of these activities a special Pilgrim Restart Assessment Panel was formed. The panel is composed of senior members of the Region I and Headquarters staffs. This panel met bimonthly, with alternate meetings on site.

5.4 Licensing Actions

(1) NRR/Licensing Meetings and Site Visits

Date	Subject
May 21, 1987	Licensing Issues, Bethesda, MD
August 4, 1987	Emergency Operating Procedure and Direct Torus Vent
September 24, 1987	Status of Pilgrim Restart/Schedule
August 19-20, 1987	Multi-Plant Action Items
August 24, 1987	Ongoing Fire Protection Reviews
December 10, 1987	Emergency Operating Procedures Upgrade
January 14, 1988	Discussion in Bethesda, MD of the in-service test program development

(2) Commission Briefings

Date	Subject
February 12, 1987	Regional Administrators' Meeting (Pilgrim Included)
December 17, 1987	Briefing on Status of Operating Reactors and fuel facilities (Pilgrim Included)

(3) Schedular Extensions Granted

Subject	Date
Emergency Preparedness (EP) Exercise	12/09/87
Emergency Preparedness (EP) Exercise	05/11/88

(4) Reliefs Granted

Subject	Date
Inservice Inspection Relief	03/26/87

(5) Exemptions Granted

Subject	Date
Duplicate Yard Lighting	10/06/87
10 CFR 50 Appendix R-Operator Action	04/14/88

(6) License Amendments Issued

Amendment No.	Subject	Date
98	New Design-Reactor Control Rod Blades	02/27/87
99	Analog Trip System Surveillance Requirements	03/03/87
100	Maximum Average Planar Linear Heat Generation Rate	04/09/87
101	Control Room Ventilation System	06/23/87
102	Standby Liquid Control System 10 CFR 50.62 Rule	08/05/87
103	Administrative Changes per 10 CFR 50.4	08/05/87
104	Nuclear Safety Review and Audit Committee changes	08/25/87
105	Cycle 8, Core Reload	08/31/87

(6) License Amendments Issued

Amendment No.	Subject	Date
106	Automatic Depressurization System Timer	09/04/87
107	Analog Trip System - Calibration Frequency	10/28/87
108	Undervoltage Relay Requirements	10/29/87
109	High Pressure Coolant Injection and Reactor Core Isolation Cooling Requirements	10/29/87
110	Rod Block and Average Power Range Monitors Trip Functions	11/30/87
111	Low Pressure Coolant Injection Requirements	11/30/87
112	Standby Gas Treatment & Control Room Air Filter Systems	01/20/88
113	Primary Containment Isolation Values 10 CFR 50 Appendix J Requirements	01/21/88
114	Fire Protection - Appendix R to 10 CFR 50 Requirements	03/08/88
115	Security Requirements - 10 CFR 73.55	03/28/88
116	Modification of Reporting Schedule Supplemental Dose Assessment & Meterological Summary	05/10/88

(7) Other Licensing Actions

Action	Date
Containment Leak Rate Monitor	02/19/87
10 CFR 50 Appendix J Review (Penetration X-21)	02/19/87
Generic Letter 83-08, Mark I Drywell Vacuum Breakers	02/27/87
Recirculation Flow Anomaly	02/28/87
Process Control Program (PCP) Review	03/03/88
Inservice Inspection Plan - 1986 Refueling Outage	03/16/87
Control Room Floor-Fire Seals	03/24/88
Smoke Seals - Conduit	03/24/88
Defects Westinghouse DC Circuit Breakers	04/13/88
Steam Binding - Pumps	04/15/88
Pilgrim SALP Activity	05/15/87
10 CFR 50 Appendix R Review	05/15/87
NUREG-0737 Item II.K.3.18 ADS Actuation Study	09/04/87
Offsite Dose Calculation Manual	10/28/87
Correct Performance of Operating Activities	11/16/87
Intergranular Stress Corrosion Cracking Augmented Inspection Program	11/25/87
Refueling Interlocks	12/17/87

5.5 Licensee Event Reports

(1) Overall Evaluation

Licensee Event Reports (LER) submitted during the period adequately described all the major aspects of the event, including all component or system failures that contributed to the event and the significant corrective actions taken or planned to prevent recurrence. The reports were thorough, detailed, generally well written and easy to understand. The narrative sections typically included specific details of the event such as valve identification numbers, model numbers, number of operable redundant systems, the date of completion of repairs, etc., to provide a good understanding of the event. The root cause of the event was clearly identified in most cases. Event information was presented in an organized pattern with separate headings and specific information in each section that led to a clear understanding of the event information. Previous similar occurrences were properly referenced in LERs as applicable.

The licensee updated two LERs during the reporting period. The updated LERs provided new information and the portion of the report that was revised was clearly denoted by a vertical line in the right hand margin, so the new information could be easily determined by the reactor.

However, in the past the licensee's threshold for reporting required monitoring. 4 LERs (87-021, 87-022, 87-023, and 87-024) were submitted only after an audit by Region I. One of these LERs, 87-021, was submitted 10 months after the event.

(2) Causal Analysis

A review of the LERs indicates a number of problems, some recurring. In particular, loss of offsite power has been a continuing problem at Pilgrim. In addition, Pilgrim has experienced repetitive events associated with inadequate procedures; administrative control problems associated with failure to conduct adequate reviews prior to maintenance and required surveillances and inadequate guidance and cautions for technicians.

Examples of unclear procedures included LER-87-015 which describes two events where RHR shutdown cooling was terminated by spurious isolation. One isolation was attributed to a procedure with inadequate instructions and cautions on installing jumpers; the other isolation was due to inadequate procedures which failed to describe the right number of jumpers. LER 87-016 describes an unplanned actuation of primary and secondary containment due to inadequate administrative controls for the planned replacement of a relay coil, specifically lack of appropriate precautions and guidance. Furthermore the event was compounded by supervisory error in researching drawings, wiring arrangements and assigning maintenance priorities.

Similarly, repeat problems can be illustrated by the following two LERs. LER-87-018 described a failed coil in a logic relay which caused a Reactor Water Cleanup System isolation. The licensee conducted a technical evaluation of similar coils, identifying those requiring replacement. LER-88-005 describes an actuation of the Primary Containment Isolation Control System and Reactor Building Isolation Control System due to a failure of a similar coil in another relay.

Our assessment of the 39 events in this reporting period indicates:

- 16 involved either administrative control deficiencies, inadequate instructions, or inadequate procedures.
- 7 involved errors by non-licensed personnel.
- As many as 8 may have involved design defects.
- As many as 19 may have been repeats of earlier or similar events at Pilgrim.

(Note: events may be assigned multiple causes)

In conclusion, the large number of events involving deficiencies in administrative controls, inadequate procedures and repeats of earlier, similar events points to the need for close monitoring of the effectiveness of licensee management in these areas.

TABLE 1

TABULAR LISTING OF LERs BY FUNCTIONAL AREA

PILGRIM NUCLEAR POWER STATION

AREA	CAUSE CODE A	B	C	D	E	X	TOTAL
1. Plant Operations	1	-	1	-	-	2	4
2. Radiological Controls	-	-	-	-	-	-	0
3. Maintenance and Modifications	4	-	1	7	6	1	19
4. Surveillance	4	-	-	4	1	1	10
5. Fire Protection	-	-	-	-	-	-	0
6. Emergency Preparedness	-	-	-	-	-	-	0
7. Security and Safeguards	1	-	-	-	-	1	2
8. Engineering and Technical Support	-	4	-	-	-	-	4
9. Licensing Activities	-	-	-	-	-	-	0
10. Training and Qualification Effectiveness	-	-	-	-	-	-	0
11. Assurance of Quality	-	-	-	-	-	-	0
TOTALS	10	4	2	11	7	5	39

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

LERs Reviewed: 87-001-00 to 88-015-00 including 88-008-01 and 87-014-01

TABLE 2

INSPECTION HOURS SUMMARY (02/01/87 - 05/15/88)

PILGRIM NUCLEAR POWER STATION

		Hours	% of Time
1.	Plant Operations	2178	22
2.	Radiological Controls	1262	13
3.	Maintenance and Modifications	2347	24
4.	Surveillance	1386	14
5.	Fire Protection	493	5
6.	Emergency Preparedness	176	2
7.	Security and Safeguards	641	7
8.	Engineering and Technical Support	1215	13
9.	Licensing Activities	*	-
10.	Training and Qualification Effectiveness	**	-
11.	Assurance of Quality	**	-
	Totals	9698	

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

** Hours expended in the areas of Training and Assurance of Quality are included in the other functional areas.

Inspection Reports included: 50-293/87-06 to 50-293/88-22

TABLE 3

ENFORCEMENT SUMMARY (02/01/87 - 05/15/88)

PILGRIM NUCLEAR POWER STATION

A. Number and Severity Level of Violations

Severity Level I	0
Severity Level II	0
Severity Level III	0
Severity Level IV	21
Severity Level V	2
Deviation	0
Total	26*

B. Violations Vs. Function Area

	Functional Areas	Severity Levels I	II	III	IV	V	Dev	Total
1.	Plant Operations	-	-	-	2	-	-	2
2.	Radiological Controls	-	-	-	8	-	-	8
3.	Maintenance and Modification	-	-	-	6	-	-	6
4.	Surveillance	-	-	-	1	-	-	1
5.	Fire Protection	-	-	-	1	-	-	1
6.	Emergency Preparedness	-	-	-	1	-	-	1
7.	Security Safeguards	-	-	-	-	-	-	3*
8.	Engineering and Technical Support	-	-	-	1	-	-	1
9.	Licensing Activities	-	-	-	-	-	-	0
10.	Training and Qualification Effectiveness	-	-	-	-	-	-	0
11.	Assurance of Quality	-	-	-	1	2	-	3
	Totals							26*

*Three security violations are being considered for escalated enforcement action and have not yet been categorized for severity.

TABLE 4

Pilgrim SALP History

Functional Area	Assessment Period							
	1/80-12/80	9/80-8/81	9/81-6/82	7/82-6/83	7/83-9/84	10/84-10/85	11/85-1/87	2/87 5/88
Operations	2	3	3	2	2	3	2	2
Radiological Controls	3	2	2	2	3	3	3	3
Surveillance	2	2	2	1	1	2	3	2
Maintenance	2	3	2	2	1	2	2	2
Emergency Planning	3	1	1	1	3	3	2	2
Fire Protection	2	2	3	1	2	-	3	2
Security	2	2	2	2	2	2	3	2
Engineering and Technical Support	-	-	-	-	-	-	1	1
Licensing	-	-	2	1	1	1	2	2
Training Effectiveness	-	-	-	-	-	-	2	2
Assurance of Quality/QA	3	3	-	-	-	-	3	2
Outage Management	3	2	2	-	1	1	1	-

TABLE 5

MANAGEMENT MEETING AND PLANT TOUR SUMMARY

DATE	SPONSOR	TOPIC
02/02/87	NRC	Management meeting at Plymouth, MA to discuss the status of licensee improvement programs (IR 87-08)
02/03/87	Massachusetts Secretary of Energy	NRC Region I Administrator and other Region I managers met in Boston, MA with several Commonwealth administrators to discuss NRC activities regarding Pilgrim
03/09/87	Massachusetts Legislature	NRC Region I Administrator and other members of the staff appeared in Boston, MA before the Massachusetts Joint Committee on the Investigation and Study of the Pilgrim Station at Plymouth (IR 87-1[illegible])
03/10/87	NRC	NRC Chairman Zech toured Pilgrim accompanied by the Regional Administrator and attended a licensee presentation (IR 87-16)
04/27/87	Massachusetts Legislature	NRC Region I Administrator and other members of the staff appeared in Boston before the Mass-chusetts Joint Committee on the Investigation and Study of the Pilgrim Station in Plymouth (IR 87-18)
05/01/87	NRC	Management meeting at NRC Region I to discuss a surveillance program violation and program weaknesses (IR 87-23)
05/07/87	NRC	1987 SALP management meeting at Plymouth, MA
05/22/87	NRC	NRC Commissioner Carr toured the plant and attended a licensee presentation
05/27/87	Plymouth Board of Selectmen	Four NRC Region I management representatives participated in a public meeting in Plymouth, MA
06/24/87	NRC	NRC Commissioner Asselstine toured the plant and attended a licensee presentation

DATE	SPONSOR	TOPIC
06/29/87	NRC	Management meeting at NRC Region I to discuss the outage status, program improvements and licensee preparations for restart (IR 87-28)
07/23/87	Commonwealth of Mass.	The NRC Section Chief, Licensing Project Manager and Resident Inspectors for Pilgrim met onsite with representatives of the Commonwealth to discuss the NRC inspection process (IR 87-27)
09/09/87	NRC	Enforcement conference at NRC Region I to discuss several security violations (IR 87-30)
09/24/87	NRC	NRC Director of the Office of Nuclear Reactor Regulation, the Region I Administrator and other senior NRC managers met with the licensee in Bethesda, MD to discuss licensee activities and restart readiness (NRR meeting transcript)
09/30/87	NRC	Enforcement conference at NRC Region I to discuss several security violations (IR 87-30)
10/05/87	NRC	NRC Commissioner Bernthal toured the plant and attended a licensee presentation
10/08/87	Commonwealth of Mass.	NRC Region I Administrator and other senior NRC managers met at Region I with representatives of the Commonwealth of Mass. and two private citizens to answer questions regarding the NRC inspection process (IR 87-45)
10/29/87	Duxbury Board of Selectmen	Four NRC Region I and NRR management representatives participated in a public meeting sponsored by the Duxbury Board of Selectmen, Duxbury Emergency Response Plan Committee and the Duxbury Citizens' Committee on Nuclear Matters in Duxbury, MA
12/08/87	NRC	NRC Region I Administrator toured the plant and met briefly with licensee management to discuss tour observations (IR 87-57)

DATE	SPONSOR	TOPIC
01/07/88	United States Senator Kennedy	NRC Director of the Office of Nuclear Reactor Regulation and the Region I Administrator appeared before the Senate Labor and Human Resources Committee regarding Pilgrim. The public hearing was held in Plymouth, Ma.
02/18/88	NRC	NRC Region I and NRR managers conducted a public meeting in Plymouth, MA to solicit public comments on the licensee's Restart Plan
02/24/88	NRC	Management meeting at NRC Region I to discuss the licensee's self assessment process to be used for determining restart readiness (IR 88-10)
03/10/88	NRC	The NRC Director of the Office of NRR and the Region I Administrator toured the plant and interviewed licensee staff regarding the design basis for the direct torus vent modification (IR 88-07)
04/08/88	NRC	Management meeting at NRC Region I to discuss the licensee's proposed power ascension test program (Meeting Minutes 88-43)
04/22/88	NRC	NRC Commissioner Carr toured the plant and attended a licensee presentation (IR 88-12)
05/06/88	NRC	NRC Commissioner Rogers toured the plant and attended a licensee presentation (IR 88-19)
05/11/88	NRC	NRC Region I and NRR managers conducted a public meeting in Plymouth, MA to provide responses to comments and concerns on the licensee's Restart Plan raised during the 2/18/88 public meeting (Meeting transcript)

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

SEP 07 1988

Docket No. 50-293

Boston Edison Company
ATTN: Mr. Ralph G. Bird
Senior Vice President - Nuclear
Pilgrim Nuclear Power Station
RFD #1, Rocky Hill Road
Plymouth, Massachusetts 02360

Gentlemen:

Subject: NRC Region I Inspection Report No. 50-293/88-21, Integrated Assessment Team Inspection

This refers to the Integrated Assessment Team Inspection (IATI) led by Mr. A. Randy Blough of this office on August 8-24, 1988, at the Pilgrim Nuclear Power Station (PNPS), Plymouth, Massachusetts. The results of the inspection are documented in the enclosed inspection report. At the conclusion of the inspection, an exit interview was held with you and members of your staff to discuss the scope and the findings of the inspection.

The purpose of this inspection was to perform an independent, in-depth assessment of the readiness of management controls, programs, and personnel to support safe restart and operation of the facility. The inspection Team performed an integrated evaluation of various functional areas, including operations, maintenance, surveillance, radiation protection, security, training, fire protection, and assurance of quality. Within these areas, the inspection consisted of interviews with personnel, observations of plant activities, and selective examinations of procedures, records, and documents by the inspectors.

Within the scope of its review, the Team concluded with high confidence that Boston Edison Company (BECo) management controls, programs, and personnel are generally ready and performing at a level to support safe startup and operation of the facility. Those technical items requiring resolution or completion prior to restart are being addressed and tracked by BECo. The Team identified a relatively small number of additional items for which actions or evaluations appear appropriate; BECo has made commitments in those areas, as detailed in section 2.4 of the enclosed report. As a result of this inspection, the Team concluded that there are currently no fundamental flaws in BECo's management structure, management performance, programs, or program implementation that would inhibit its ability to assure reactor or public safety during plant operation.

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If your understanding of any item detailed in Section 2.4 of the enclosed report differs from that stated, please contact Mr. Blough or me promptly. The NRC will review the status of these issues prior to any restart of PNPS.

The results of this inspection will be considered during the NRC staff's deliberations as it reaches its decision regarding a PNPS restart recommendation to the NRC Commission.

No written reply to this letter is required. Your cooperation with us is appreciated.

Sincerely,

Samuel J. Collins

Samuel J. Collins, Deputy Director
Division of Reactor Projects

Enclosure: NRC Region I Inspection Report No. 50-293/88-21

cc w/encl:
K. Highfill, Station Director
R. Anderson, Plant Manager
J. Keyes, Licensing Division Manager
E. Robinson, Nuclear Information Manager
R. Swanson, Nuclear Engineering Department Manager
The Honorable Edward J. Markey
The Honorable Edward P. Kirby
The Honorable Peter V. Forman
B. McIntyre, Chairman, Department of Public Utilities
Chairman, Plymouth Board of Selectmen
Chairman, Duxbury Board of Selectmen
Plymouth Civil Defense Director
P. Agnes, Assistant Secretary of Public Safety, Commonwealth of Massachusetts
S. Pollard, Massachusetts Secretary of Energy Resources
R. Shimshak, MASSPIRG
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Massachusetts (2)
P. Chan, Commonwealth of Massachusetts
S. Sholly, MHB Technical Associates

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket No.: 50-293

Report No.: 50-293/88-21

Licensee: Boston Edison Company
Pilgrim Nuclear Power Station
RFD #1, Rocky Hill Road
Plymouth, Massachusetts 02360

Facility: Pilgrim Nuclear Power Station

Location: Plymouth, Massachusetts

Dates of Inspection: August 8-24, 1988

Inspectors: (See Attachment E)

Approved By: Lawrence T. Doerflein for 9/7/88
A. Randy Blough, Chief Date
Reactor Projects Section No. 3B
Division of Reactor Projects

Inspection Summary:

Areas Inspected: Integrated Assessment Team Inspection to assess the degree of readiness of licensee management controls, programs, and personnel to support safe restart and operation of the plant. The scope of the inspection is further detailed in Section 2.2.

Results:

The team concluded that licensee management controls, programs, and personnel are generally ready and performing at a level to support safe startup and operation of the facility. Results are further summarized in Sections 1.0 (Executive Summary) and 2.3 (Summary of Findings).

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ACRONYMS

ALARA	-	As Low As Reasonably Achievable
ANSI	-	American National Standards Institute
ASME	-	American Society for Mechanical Engineers
BECo	-	Boston Edison Company
BEQAM	-	Boston Edison Quality Assurance Manual
CAS	-	Central Alarm Station
CQI	-	Commercial Quality Item
CS	-	Core Spray (System)
CST	-	Condensate Storage Tank
DC	-	Direct Current
DCRDR	-	Detailed Control Room Design Review
DG	-	Diesel Generator
DR	-	Deficiency Reports
EOP	-	Emergency Operating Procedures
EO	-	Equipment Operator
EPRI	-	Electric Power Research Institute
EQ	-	Environmental Qualification
ESF	-	Engineered Safety Feature
ESR	-	Engineering Service Request
F&MR	-	Failure and Malfunction Reports
FYI	-	For Your Information
GET	-	General Employee Training

Acronyms

HP	-	Health Physics
HPES	-	Human Performance Evaluation System
HSA	-	Housekeeping Service Assistance
IATI	-	Integrated Assessment Team Inspection
I&C	-	Instrumentation and Control
ICA	-	Immediate Corrective Actions
INPO	-	Institute of Nuclear Power Operations
IST	-	In-Service Testing
LCO	-	Limiting Condition for Operations
LL/J	-	Lifted Lead/Jumper
LSFT	-	Logic System Functional Test
M&TE	-	Measuring and Test Equipment
MCAR	-	Management Corrective Action Requests
MCIAP	-	Material Condition Improvement Action Plan
MO&AT	-	Management Oversight and Assessment Team
MOP	-	Mission, Organization and Policy Manual
MPC	-	Maximum Permitted Concentration
MR	-	Maintenance Request
MSC	-	Maintenance Summary and Control
MSTP	-	Master Surveillance Tracking Program
MWP	-	Maintenance Work Plan
NCR	-	Nonconformance Report
NED	-	Nuclear Engineering Department
NOP	-	Nuclear Organization Procedures

Acronyms

NRC	-	Nuclear Regulatory Commission
NRR	-	Office of Nuclear Reactor Regulation
NSRAC	-	Nuclear Safety Review and Audit Committee
NWE	-	Nuclear Watch Engineer
OMG	-	Outage Management Group
ORC	-	Operations Review Committee
P&ID	-	Piping and Instrument Diagram
PCAQ	-	Potential Condition Adverse to Quality
PDC	-	Plant Design Change
PI	-	Pressure Indicator
PM	-	Preventive Maintenance
PNPS	-	Pilgrim Nuclear Power Station
PCIS	-	Primary Containment Isolation System
QAD	-	Quality Assurance Department
RCIC	-	Reactor Core Isolation Cooling
RETS	-	Radiological Environmental Technical Specifications
RHR	-	Residual Heat Removal (System)
RO	-	Reactor Operator
ROR	-	Radiological Occurrence Report
RP	-	Radiation Protection
RWP	-	Radiation Work Permits
SAA	-	Simulated Automatic Actuation
SAS	-	Secondary Alarm Station

Acronyms

SBLC	-	Standby Liquid Control (System)
SDR	-	Security Deficiency Reports
SE	-	Safety Evaluations
SEG	-	Systems Engineering Group
SES	-	Senior Executive Service
SFR	-	Supplier Finder Reports
SGI	-	Safeguards Information
SI	-	Station Instruction
SRO	-	Senior Reactor Operator
STA	-	Shift Technical Advisor
SVP-N	-	Senior Vice President - Nuclear
TM	-	Temporary Modification
TS	-	Technical Specifications
VP-NE	-	Vice President - Nuclear Engineering
WIP	-	Workforce Information Program
WPRT	-	Work Prioritization Review Team

1.0 EXECUTIVE SUMMARY

In response to NRC concerns over longstanding issues regarding the management effectiveness of the Boston Edison Company (BECo) in the operation of the Pilgrim facility, the licensee agreed to maintain the plant in a shutdown condition following operational events which occurred on April 11-12, 1986. The NRC confirmed the licensee's agreement in Confirmatory Action Letter (CAL) 86-10. The CAL, as supplemented in an August 27, 1986 letter, also confirmed that the licensee would develop a comprehensive plan to address those concerns and perform an in-depth self-assessment of the effectiveness of that Plan. On June 25, 1988, the licensee reported it had completed these activities to the extent that an NRC review was appropriate. In order to assess the status and results of BECo's corrective actions, the NRC performed an independent review of the effectiveness of the licensee's management controls, programs and personnel during an Integrated Assessment Team Inspection (IATI) conducted August 8-24, 1988.

The Team consisted of an SES-level manager, a Team leader, and members of the NRC Region I and Headquarters staff. The inspection team also included two observers representing and appointed by the Commonwealth of Massachusetts. These observers had access and input to all aspects of the inspection as provided by the established protocol. The areas reviewed during the inspection included operations, maintenance, surveillance, radiation protection, security, training, fire protection and assurance of quality. The Team reported directly to the Regional Administrator of Region I.

Overall, the Team concluded with high confidence that BECo management controls, programs, and personnel were generally ready and performing at a level to support safe startup and operation of the Pilgrim Nuclear Power Station. Further, although the Team identified certain items which require licensee actions or evaluations, there were no fundamental flaws found in the licensee's management structure, management performance, programs, or program implementation that would inhibit its ability to assure reactor or public safety during plant operation.

2.0 INTRODUCTION

This report details the findings, conclusions and observations of NRC's Integrated Assessment Team Inspection conducted at the Pilgrim Nuclear Power Station (PNPS) on August 8-24, 1988. The results of this inspection are to be considered during NRC staff's deliberations as it reaches its decision regarding a restart recommendation to the NRC Commissioners.

2.1 Background

The NRC's 1985 Systematic Assessment of Licensee Performance (SALP) found programmatic weaknesses in several functional areas at the Pilgrim Nuclear Power Station and noted that, historically, the licensee could not sustain performance improvements once achieved. A special NRC Region I diagnostic team inspection was subsequently performed in February and March 1986 to evaluate facility performance. This inspection, which included monitoring plant activities on a 24-hour basis, confirmed the 1985 SALP and concluded that poor management control and incomplete staffing contributed to the poor performance.

Following several operational events, Boston Edison Company (BECo) shutdown PNPS on April 11-12, 1986. The NRC subsequently issued a Confirmatory Action Letter (CAL) on April 12, 1986, and a supplement on August 27, 1986, maintaining the plant shutdown and requiring that the licensee obtain NRC approval prior to restart. The central issues in the CAL, as supplemented, involved the effectiveness of licensee management of the facility and technical concerns.

SALP evaluations continued during the shutdown, and improvements were noted during the 1986 SALP period, although the rate of change was slow. Several factors inhibited progress, including continued management changes and prolonged staffing vacancies. Good performance was noted in four areas: emergency planning, outage management, corporate engineering support and licensed operator training. The success in these areas reflected a high level of corporate management attention and substantial resource commitments. The licensee also had made significant plant hardware improvements, including Mark I Containment performance enhancements.

Consistent with the CAL and its supplement, BECo has addressed the specific technical issues, developed and submitted the Pilgrim Nuclear Power Station Restart Plan and performed a detailed self-assessment of readiness for restart. The NRC staff reviews of these items are complete. The licensee has also submitted a Power Ascension Test Program, for which the staff review is ongoing.

NRC subsequently completed a SALP evaluation for Pilgrim covering the period February 1, 1987 to May 15, 1988. It concluded that licensee management initiatives are generally successful in correcting staffing, organization, and material deficiencies. Programmatic performance improvements were evident in areas previously identified as having significant weakness and in areas that the licensee's self-assessment process identified as warranting further management attention.

The NRC Confirmatory Action Letter (CAL) of April 1986 required the NRC to perform a review to assess BECo's corrective actions. In conjunction with an augmented inspection program and as part of a continuing effort to monitor BECo's program improvements, the NRC planned this IATI to independently measure the effectiveness and readiness of the licensee's management controls, programs and personnel to support safe restart of the facility. A Restart Readiness Assessment Report that includes staff assessment results will be prepared by the NRC in conjunction with development of an NRC staff recommendation regarding plant restart.

2.2 Scope of Inspection

The IAT inspection was performed to provide an independent, in-depth assessment of the degree of readiness of licensee management controls, programs, and personnel to support safe restart and operation of the Pilgrim Nuclear Power Station (PNPS). The inspection covered a variety of functional areas, including operations, maintenance, surveillance, radiation protection, security, training, fire protection, and assurance of quality. Particular emphasis was placed on management effectiveness and on the status of the licensee's recent program improvements in maintenance. The inspection consisted of interviews with licensee personnel, plant tours, observations of plant activities, and selective examinations of procedures, records, and documents. The Team also directly observed ongoing plant activities on all shifts from August 10-13, 1988.

The 15-member Team consisted of a senior manager, inspection team leader, five shift inspectors, and several specialist inspectors from both NRC Region I and the NRC Office of Nuclear Reactor Regulation (NRR). Two representatives from the Commonwealth of Massachusetts were also on the Team as observers throughout the inspection. The team roster and member resumes are attached as Appendices E and F to this report.

Onsite IATI preparation, which included site familiarization and plant tours, was conducted during the week of July 18, 1988. The Team was onsite full-time from August 8 through 19, 1988. Some IATI members were on site during the documentation period of August 20-24, 1988. Attendees at the entrance and exit interviews are listed in Appendices A and B, respectively. Senior licensee managers contacted during the course of the inspection are listed in Appendix C. Many other persons at all levels of the organization were also contacted or interviewed.

The licensee was not presented with any written material by the NRC during this inspection. The licensee indicated that no proprietary material was presented for review during this inspection.

2.3 Summary of IATI Results

2.3.1 Overall Summary

The Team concluded, with high confidence, that licensee management controls, programs, and personnel are generally ready and performing at a level to support safe startup and operation of the facility. Technical items requiring resolution or completion prior to restart are being addressed and tracked by the licensee. The Team identified a relatively small number of additional items for which licensee actions or evaluations appear appropriate; during the inspection, the licensee made acceptable commitments in these areas. There are currently no fundamental flaws in the licensee's management structure, management performance, programs, or program implementation that would inhibit its ability to assure reactor or public safety during plant operation.

The inspection generally confirmed the results of the SALP report for February 1, 1987 through May 15, 1988, as well as validating the general SALP conclusion that performance was improving at the end of the SALP period. Further, licensee performance appeared to be consistent or improving in all functional areas examined during the IATI, with the current level of achievement for overall safety performance equal to or better than that described in the SALP. For maintenance and radiation protection, the performance is noticeably improved.

The inspection generally confirmed the effectiveness of various licensee self-improvement programs and of the licensee's self-assessment process. The Team identified relatively few issues that had not been previously identified by the licensee. In the interest of continually improving its self-assessment process, the licensee should evaluate those cases where NRC either identified new issues or assigned a higher sense of priority than identified by the licensee.

The inspection confirmed that important organization and attitudinal changes had occurred since 1986. Of particular concern to NRC during the diagnostic inspection in 1986 were several factors inhibiting progress. These included:

1) Incomplete staffing, especially of operators and key mid-level supervisory personnel;

2) The prevailing licensee view that improvements to date had corrected the problems identified;

3) Reluctance by licensee management to acknowledge some problems identified by NRC; and

4) Dependence on third parties to identify problems rather than implementing an effective licensee program to identify weaknesses.

The Team found these inhibitors to be substantially removed, and noted that a significantly improved nuclear safety ethic exists at management levels and is developing successfully at the worker level.

Based on a review of the management structure, staffing, goals, policies and administrative controls, the Team concluded that the licensee has an acceptable organization and administrative process, with adequate management and technical resources to assure that the plant can be operated in a safe and reliable manner during normal and abnormal conditions. Further, this performance-based inspection provided an integrated look at overall management effectiveness in ensuring high standards of nuclear safety. The overall conclusions of this inspection confirm facility management effectiveness, especially its ability to perform self-assessment functions, to improve performance, and to raise nuclear safety awareness and attitudes throughout the organization.

2.3.2 Summary of Results by Functional Area

Within each functional area, conclusions were reached including the identification of various strengths and weaknesses. These are summarized below. The basis for these items, as well as the many significant observations made by the Team, are explained in Section 3 of this report.

2.3.2.1 Operations

<u>Strengths</u>

-- Experienced and knowledgeable senior licensed operators

-- Effective shift turnover

-- Excellent plant housekeeping

Weakness

-- Lack of thoroughness and attention to detail in validation and training of Emergency Operating satellite procedures

2.3.2.2 Fire Protection

Strengths

-- Effective program staffing and supervision

-- Effective prioritization, control, and tracking of fire protection equipment maintenance

Weaknesses

None

2.3.2.3 Maintenance

Strengths

-- Good organization and structure

-- Thorough program procedures

-- Clear maintenance section internal communications and interactions

-- Good control and support of field activities

Weaknesses

-- Examples of poor implementation of planning for post-work testing

-- Poorly controlled storage of Q-listed items at two locations outside the warehouse

2.3.2.4 Radiological Controls

Strengths

-- Effective use of a maintenance health physics (HP) advisor

-- A well-organized training program

Weaknesses

-- Examples of a lack of continuity and proficiency in certain highly specialized jobs because of frequent technician rotation

-- Indications of weak vertical communications within the HP group

2.3.2.5 Surveillance

Strength

-- Management commitment to improve an already satisfactory program

Weakness

-- Incomplete resolution of proper frequency and scheduling of once-per-refueling outage tests

2.3.2.6 Security

Strength

-- Overall management attention

Weaknesses

None

2.3.2.7 Training

Strengths

-- Excellent management support for operator training programs

-- Strong relations between the plant operations and training departments

Weakness

-- Lack of a defined process to assure timely identification and implementation of training needs resulting from newly approved or revised procedures

2.3.2.8 Engineering Support

-- Not directly reviewed. No specific strengths or weaknesses identified

2.3.2.9 Safety Assessment/Quality Verification

Strengths

-- Nuclear Safety Review and Audit Committee (NSRAC) composition, plant tour program, frequency and location of meetings, open forum, and focus of reviews

-- Attitude and performance toward identifying problems

-- Effective, meaningful communications between the Quality Assurance and plant Operations departments

Weaknesses

-- Operations Review Committee does not perform an effective independent group review of operations and Technical Specification violations

-- Multiplicity of corrective action programs without centralized tracking

-- Poor tracking of Potential Condition Adverse to Quality (PCAQ) reports

2.3.2.10 Management Oversight

Strengths

-- Well-defined organization, incorporating appropriate span-of-control and including highly qualified, experienced managers in key positions

-- Well-defined and well-conceived corporate goals

Weaknesses

None

2.4 Licensee Commitments

During the IAT inspection, the licensee made certain commitments to the inspection Team. These commitments relate to licensee corrective or enhancement actions planned in response to Team findings or concerns. These commitments, summarized below, are discussed in more detail in subsequent sections of this report, shown in parentheses. Commitments were confirmed during the exit interview. The status of these issues will be reviewed by the NRC prior to any restart of the plant (88-21-01).

2.4.1 Procedure Validation and Training (Section 3.2.4)

By restart, the licensee will confirm effective implementation of all off-normal and EOP satellite procedures that have been substantively revised during this outage.

2.4.2 Identifying Procedure Changes Requiring Training (Section 3.7.2.1)

Before restart, the licensee will implement a process to allow more timely identification of new procedures and procedure changes which require training.

2.4.3 Temporary Modifications (Section 3.2.5)

By restart, the licensee will either prepare a justification for operation for each active temporary modification or apply the temporary modification extension request process to all temporary modifications, including those with outstanding engineering service requests.

2.4.4 Operations Review Committee (ORC) (Section 3.10.3)

Prior to restart, in order to strengthen its operational focus, the ORC will begin to: (1) review plant incident critiques; (2) review licensee event reports before their issuance to NRC; (3) review failure and malfunction reports on a regular basis; and, (4) provide for a monthly presentation and discussion of plant operations as a specific agenda item.

2.4.5 Maintenance

-- Before restart, the licensee will re-evaluate all priority 3 maintenance requests to ensure that they have been properly scheduled. (Section 3.3.2.4)

-- The licensee will complete training addressing the revised post-work testing program by September 9, 1988. (Section 3.3.2.6)

-- The licensee will resolve the inability to align valves in the Torus Water Makeup Line in accordance with current operating procedures and drawings prior to restart. (Section 3.3.2.4)

-- The licensee will issue a procedure to provide appropriate controls for the "Q" oil storage facility by September 7, 1988, and perform an evaluation of the possible addition of "non-Q" oil to "Q" equipment and its potential effect. (Section 3.3.2.3)

-- The licensee will complete, before restart, the disposition of a Potential Condition Adverse to Quality (PCAQ) identifying the need for a review of Commercial Quality Item procurement documents for consistency with approved engineering specifications. (Section 3.3.2.3)

2.4.6 Surveillance

-- Before restart, the licensee will review and evaluate the once-per-refueling-outage surveillance tests to determine if they should be repeated to enhance the assurance of system operability and document the basis for its decision. (Section 3.4.2.1)

-- Before restart, the licensee will provide the technical basis for the current test frequency of the Reactor Core Isolation Cooling (RCIC) System Logic System Functional Test (LSFT) on the initiation logic. (Section 3.4.2.2)

2.4.7 Formalizing Personnel Qualification Reviews

The licensee will verify before restart the qualifications of all personnel within the organization required to meet ANSI 18.1-1971; and, prior to completion of the power ascension program, will have a formalized process in-place to ensure future auditability. (Section 3.1.4)

2.4.8 Mission, Organization and Policy (MOP) Manual

The licensee will issue MOP policy instructions prior to restart and the organizational position descriptions prior to completion of power ascension. (Section 3.1.5)

2.4.9 Familiarizing Workers with Expected Radiological Conditions

Before restart, the licensee will provide training and briefings to the appropriate plant staff regarding expected radiological conditions resulting from plant operation anc hydrogen addition. (Section 3.5.2.14)

2.4.10 Control Room Human Factors

The licensee will evaluate control room human factors during the power ascension program and include an update regarding the schedule and scope of "Paint, Label and Tape" items in their report to the NRC at the completion of the Power Ascension Program. (Section 3.9.2)

3.0 DETAILS OF INSPECTION

The following sections contain the scope of inspection, the detailed findings, and the conclusions for each functional area the Team assessed.

3.1 Management Oversight

3.1.1 Scope of Review

The IATI assessed the organizational structure currently in place at the Pilgrim Nuclear Power Station (PNPS). The assessment also included the administrative processes in place to control and coordinate the activities and actions affecting safe and reliable operation of the PNPS. Other areas inspected included the adequacy of staffing, qualifications of personnel, and mechanisms to enhance and promote stability in the organization's technical and managerial staff.

Several management meetings were observed by Team members to assess the interactions of managers and the effectiveness of the policies and procedures being implemented. Continual observations were made and shared by Team members to augment findings and conclusions in the effectiveness of the organization, management controls, and communications throughout the functional areas. The Team members interviewed a cross-section of personnel at all levels of the organization to determine if the overall attitude toward performance of safety-related activities has improved. These observations and interviews also provided the Team with insight into the worker perception of management policies, involvement, effectiveness and its resulting impact on safety.

3.1.2 Organization

The NRC staff noted in the most recent SALP report No. 50-293/87-99 for February 1, 1987 through May 15, 1988, that an organizational transition had taken place. The report also noted that several temporary changes, including numerous changes in personnel, had been made to strengthen planning, control and performance at PNPS. Many of these temporary changes were incorporated into a permanent reorganization in February 1988. The licensee continued to refine the new organziation and control process through

July 1988, notified NRC of the reorganization, and subsequently requested an amendment in August 1988 to the administrative section of its Technical Specifications (TS) to reflect the new organization. The notification and request were in accordance with the PNPS TS, Section 6.2.C, "Changes to the Organization," which allows organizational changes to be implemented without prior NRC approval, provided notification is made and a subsequent license amendment request is submitted for NRC review and approval.

The organization assessed during this inspection is the subject of the licensee's amendment request dated August 1, 1988, and approved by the Senior Vice President - Nuclear (SVP-N) on August 4, 1988. The discussion that follows does not describe in complete detail the entire organization, focusing instead on that portion that affects the functional areas being evaluated during this inspection (See Figure 1). The results of this inspection will be considered in NRC's review of the licensee's amendment request.

The Team noted that the licensee has incorporated a balance between the number of management levels from the first-line supervisors to the SVP-N and the span of control for each functional unit. The SVP-N has the Station Director, Vice President - Nuclear Engineering (VP-NE), Emergency Preparedness Department manager and Quality Assurance Department manager reporting directly to him. The two department managers report directly to the SVP-N to assure that independence and appropriate management attention are provided based on their functional requirements and responsibilities.

The committee charged with offsite safety, the Nuclear Safety Review and Audit Committee (NSRAC), reports directly to the SVP-N. The committee for onsite safety review, the Operations Review Committee (ORC), reports directly to the Station Director. The reporting of the offsite committee to the SVP-N and the onsite committee to the Station Director are appropriate based on their responsibilities. Details on these standing committees, their functional requirements, responsibilities and accountabilities, are contained in Section 3.10 of this report.

The VP-NE has two department-level managers reporting directly to him. These departments are the Nuclear Engineering Department and the Management Services Department both of which are located offsite. The Station Director has four department-level managers reporting directly to him: the Plant Support Department, Plant Manager (Operations), Planning and Outage Department, and the Nuclear Training Department.

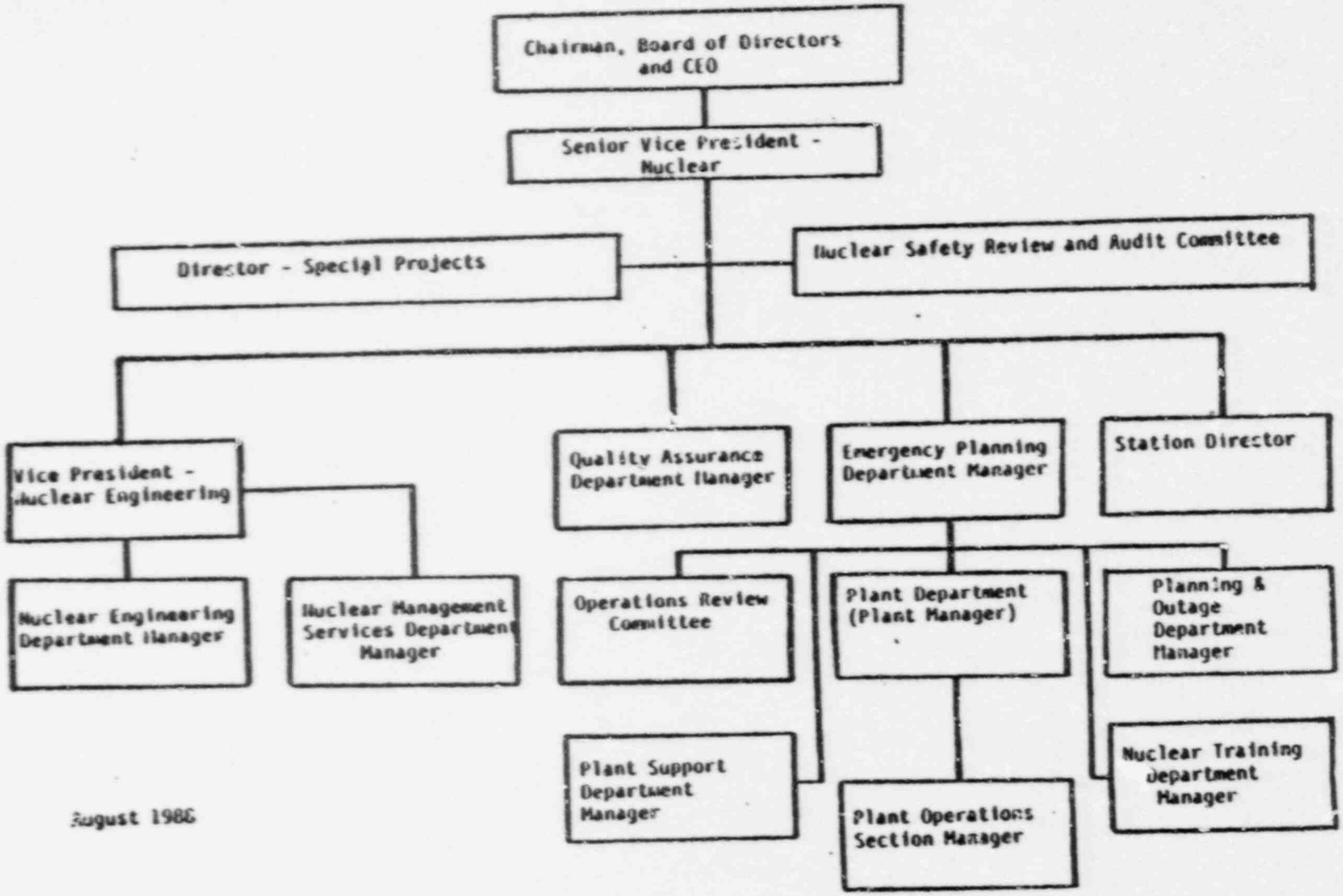

Figure 1. BOSTON EDISON COMPANY - PILGRIM ORGANIZATION

The senior manager of the functional areas is at the department level, which is then subdivided into section levels and division levels. The first-line supervisors, in some cases senior supervisors, report to the division managers.

The station organization, now under a Station Director who has no direct corporate (i.e., off-site) responsibilities, represents a substantial change from previous organizations. The current structure was instituted to strengthen management attention to plant activities. The narrowing of the span of direct control and responsibility of the Plant Manager allows a more focused management and control of operational activities, which should result in the enhancement of safe and reliable operation. The departments reporting to the VP-NE have been restructured for a more even distribution of responsibilities.

The Team concluded that the current organizational structure provides for an appropriate distribution (span) of responsibilities and accountabilities for the activities being performed by the functional units within it. The depth (number) of managers in the functional areas should contribute to improved performance and organizational stability by providing managers with increased opportunities to participate in professional technical and management development programs and by increasing the framework for career growth.

The Team also concluded that the redistribution of functional responsibilities and increased depth in management provides the framework necessary to enhance stability and support safe and reliable operation at PNPS. The evidence for these changes thus far has been management's effectiveness in creating a much-improved nuclear safety ethic and in improving the functional areas described in the subsequent sections of this report.

3.1.3 Staffing

The most recent SALP Report (No. 50-293/87-99) indicated that the allocated staffing levels were significantly higher than in the past. The Nuclear Organization is currently authorized a staffing level of 985. Approximately 90% of the authorized positions are filled, of which 86% are licensee personnel; the remaining 4% comprise contract personnel. Licensee personnel fill all key positions from Section Managers and above, with less than 15% of the remaining managers and first-line supervisor positions filled by contractors or licensee personnel in acting capacities.

Increased staffing in all levels of the Radiological and Maintenance Sections are examples of how the licensee has provided the necessary management attention and resources to areas that need them. The increased staffing, specifically at the craft and technician level, appears sufficient to allow for a planned and controlled preventive maintenance program that should result in overall safety enhancement. The increased staffing levels also allow for training on a routine schedule.

The Team concluded that the authorized staffing has been filled to a level acceptable for the licensee to perform all the necessary functions for all plant conditions, including operations. This finding is reinforced by the evidence of improvements in the functional areas described in the subsequent portions of this report.

3.1.4 Qualifications

The PNPS TS, Section 6.3, "Facility Staff Qualifications," requires that PNPS personnel meet the requirements of the American National Standards Institute (ANSI) N18.1-1971, "Selection and Training of Personnel for Nuclear Power Plants." The TS also requires that the Radiation Protection Manager shall meet or exceed the qualifications of Regulatory Guide 1.8, "Qualification and Training for Personnel at Nuclear Power Plants," September 1975.

The Team audited resumes and position descriptions of key managers and other selected personnel throughout the organization. Their educational and experience backgrounds were compared with the requirements delineated in ANSI N18.1-1971, with special attention on the management experience of key personnel. No deficiencies were identified relating to the qualification requirements of the ANSI standard. More significantly, the Team noted the staffing of key management positions with personnel having extensive and successful management experience.

During its review, the Team found that some resumes needed updating, and that no formal, detailed instructions or guidance in establishing qualifications were available. The Team reviewed a Quality Assurance Department (QAD) audit report of the organization's administrative controls which was conducted June 22 through July 22, 1988 and which resulted in similar findings. The report, Audit Report 88-25, "Administrative Controls," dated August 18, 1988, indicated that personnel qualifications were audited by the QAD to determine compliance with the ANSI N18.1 requirements for the organizational positions held. No deficiencies were identified as the result of the QAD audit. The report did, however, provide a recommendation consistent with the NRC inspector's finding. Specifically, Recommendation No. 88-25-03, notes the need to update resumes, develop guidelines and procedures for documenting qualification status, and maintain retrievable files.

The licensee has committed to the Team to reverify the qualifications of all personnel within the organization to confirm they comply with ANSI N18.1-1971 prior to restart and to have a process in place prior to completion of the Power Ascension Program to ensure future auditability of personnel qualifications.

Within the scope of the NRC review, the Team determined that the licensee's personnel are generally well qualified for the positions held within the organization. The licensee's commitment to reverification of all personnel qualifications prior to restart will provide additional assurance of full compliance relating to personnel qualifications.

The results of the IATI effort in assessing the adequacy of the staffing and qualifications of the PNPS organization is consistent with the overall facility evaluation in the most recent SALP report (No. 50-293/87-99). It noted the addition of management personnel who lack extensive commercial nuclear power plant operating experience. However, as noted above, recent changes have resulted in the addition of personnel in key management positions with extensive and successful management experience, much of which is in nuclear areas. Also, many mid-level management positions are held by individuals who have extensive Pilgrim NPS (or other boiling water reactor) experience. The Team concluded that the combination of commercial nuclear power plant operating experience in the organization with the increased management capability provides the qualifications necessary to support safe and reliable operation at PNPS. In the event of a restart authorization, licensee safety performance will be closely monitored by the NRC during the Power Ascension Program.

3.1.5 Administrative Policy and Procedures

The licensee has a variety of procedures to provide policy, control and coordination of organization activities. Corporate policy is provided in the form of company Bulletins maintained in a Boston Edison Company Organizational Manual. The manual includes information about the corporate organization, its policy statements, corporate instructions, and committees which affect the entire company, including the Nuclear Organization. The corporate level policy specifically affecting the Nuclear Organization is contained in a Mission, Organization and Policy (MOP) manual.

The Nuclear Organization Procedures (NOPs) provide guidance for the control and coordination of the Nuclear Organization. They include administrative procedures affecting the entire organization, as well as procedures affecting functional portions of the organization. Each department also has procedures in place specifically for its functional areas. The Team reviewed several NOPs to assure that the guidance provided was current, reflected the organization in place, and addressed coordinating activities within the organization. The Team also reviewed department-level procedures to assure they included the current organization, goals, department function, position descriptions, qualifications required, responsibilities, and accountabilities.

The Team concluded that the procedures are, for the most part, current. They adequately identify corporate policy, organization, coordination, functional requirements, responsibilities, accountabilities, and qualifications necessary for the control and coordination of actions within the organization.

The Mission, Organization and Policy Manual (MOP) is not fully up to date; however, and is currently being revised to accurately reflect current policy and to include all the position descriptions within the organization. The licensee has identified additional refinements in the organizational position descriptions to assure consistency and to provide accurate definitions of responsibilities necessary to assure accountability. The licensee was previously aware of this and has been working to finalize the updates. The licensee committed to issue the revised MOP which includes updated policy prior to restart and to complete the organizational position description refinements before the end of the Power Ascension Program. This commitment is acceptable, based on the status of the other procedures previously discussed which assure adequate administrative controls.

3.1.6 Communications and Observations

Corporate policy for the Nuclear Organization in the MOP manual includes, among its goals, the need to strive to raise standards of performance, for dedication to protecting the environment and public, and for rigorous adherence to procedures. The Team, through its observations and interviews, noted a positive change in the attitude toward nuclear safety throughout PNPS. This change is evident in improved performance of safety-related activities. These improvements are indicated in the most recent SALP Report (No. 50-293/87-99), and progress in the other functional areas is addressed in this inspection report. The Team also noted during interviews that the corporate goal of adherence to procedures has been conveyed to all levels of the organization. These observations attest to management's effectiveness in communicating corporate goals and management's oversight in assuring that the goals are being pursued.

The Team noted that the licensee established several mechanisms to assure adequate communications within the organization. Meetings at all levels of the organization are held on a routine basis. Plant meetings are held every morning to discuss plant status and to coordinate daily activities. Several of these meetings were observed by the Team to assess the interaction of the managers and the resulting effectiveness. The Team concluded that the meetings were effective and that safety-related activities are being planned, scheduled, and prioritized in accordance with their safety significance and plant status. These and other observations by the Team indicate that teamwork at the site is evident. There are programs in place, such as the Workforce Information Program (WIP), For Your Information (FYI), and Management Oversight and Assessment Team (MO&AT) to enhance management involvement, overall communications, and management visibility in the plant.

The licensee has also established a set of performance indicators to track performance issues, restart issues, plant condition reports, and activity status. These performance indicators are used as a management tool to measure the effectiveness and results of established programs.

The Team concluded, based on its evaluation of programs in-place, that communications throughout the organization have improved, that teamwork is evident, and that corporate goals are being conveyed to all levels of the organization.

3.1.7 Conclusions

The Team concluded that the licensee has an acceptable organization and administrative process in place with adequate management and technical resources to assure that PNPS can operate in a safe and reliable manner during normal and abnormal conditions. This conclusion is based on the details discussed above, the performance-based inspection in the functional areas covered by the IATI, the overall consistency in the findings of this inspection with the most recent SALP (No. 50-293/87-99), and the plan for a structured and controlled power ascension program prior to operation.

This performance-b d inspection of a wide range of functional areas provic.: an integrated look at overall management effectiveness in ensuring high standards of nuclear safety. The overall conclusions of this inspection confirm facility management effectiveness, especially with respect to management's ability to perform self-assessment functions, to make performance improvements, and to raise nuclear safety awareness and attitudes within the organization.

3.2 Operations

3.2.1 Scope of Review

The Team evaluated operations by observing how supervisors, operators and staff performed in the control room and throughout the plant. The Team observed plant operations during backshifts from August 10 through August 13, 1988, and reviewed staffing levels to determine if they were sufficient to support restart with minimal reliance on overtime. The ability to implement recently written EOP satellite procedures and the quality of these procedures were evaluated through a field walkdown of a procedure. The implementation of administrative controls for operations was evaluated through inspections of overtime controls, temporary modification controls, operator-required reading, logkeeping, tagouts, and operator aids. The line-up of two safety systems was independently verified by the inspectors. Housekeeping was observed during frequent plant tours.

3.2.2 Conduct of Operations

The Team observed control room operations on all shifts. They were conducted in a formal manner, with effective communications between the operators and supervisors, including repeat backs for certain functions. There was no unnecessary traffic in the control room. Supervisors briefed shift personnel on significant functions before they occurred. Prior to energizing the recirculating pump heaters, which could have produced smoke in the drywell, the watch engineer thoroughly briefed to the reactor operator, equipment operator, and fire brigade leader.

The watch engineers, shift supervisors, and reactor operators were knowledgeable about plant conditions and ongoing work in the plant. Shift turnover briefings were thorough and were followed by control room panel walkdowns. Attendance at these briefings was inconsistent in that not all watch engineers include other shift personnel, such as health physics shift workers in the pre-shift briefing. The Team observed that the health physics shift workers receive separate briefings. The Team discussed this practice with plant management, which stated that it was their intent to include non-operations shift workers in the pre-shift briefing and that they would review its implementation.

Control room operators received good support from the shift technical advisors (STA), administrative assistants, and other departments. The STA's were used in developing failure and malfunction reports (F&MR), and in the initial followup of an EOP satellite procedure issue. The administrative assistants do much of the administrative paperwork and help to lessen traffic in the control room. There was very good support of operations from other departments in understanding and deciding the proper course of action in response to F&MR events.

The Team accompanied several non-licensed equipment operators (EO's) on their tours. The EO's performed their plant tours in accordance with Procedure 2.1.16, "Nuclear Power Operator Tour." Readings were taken and recorded, as required. The operators also checked for abnormal conditions, such as vibrations, noise, leakage, odors, and inadequate ventilation. The EO's commented that they now have more time to check general plant conditions on their rounds because the rounds are assigned to two EO's per shift. Previously, only one EO made the plant tour. The EO's showed good regard for radiological protection and ALARA practices. The operators were very familiar with the plant, systems, and components, and were knowledgeable about their duties and responsibilities. The performance by these operators demonstrated the effectiveness of the non-licensed training program.

Watch engineers or operating supervisors accompany EO's on plant tours at least once per week. Operations management, including the chief operating engineer and operations manager, were observed touring the control room frequently and discussing plant status and evolutions with the watch engineer.

The Team discussed the licensee's use of NRC's NUREG-1275, "Operating Experience Feedback Report-New Pl[illegible] ver-ified that licensee management had revi[illegible]-1275 recommendations for applicability. BECo ha[illegible]ently initiated a number of improvements related to [illegible]G-1275 recommendations before they reviewed the report. This action was considered by the Team as a positive example of the quality of BECo self-improvement efforts. Some self-identified improvement items include operator communications training, seminars to improve attention to detail, splitting tours and revising tour sheets to improve equipment operator performance, and doing dry run training on the power ascension and alternate safe shutdown evolutions. Some improvement items resulting from the NUREG review include seeking a more positive method of performing on-shift instructions, repeating all logic system functional tests, and performing a comprehensive review of inadvertent emergency safety feature (ESF) actuations. The ESF actuation review has resulted in several corrective actions.

In summary, the licensee conducted operations in a professional manner. Operators are knowledgeable about their duties and plant conditions and management keeps an active and effective oversight of operations.

3.2.3 Shift Staffing and Overtime Controls

The licensee's Senior Reactor Operators (SRO) are very experienced and strengthen the operations organization. To take advantage of this experience, an extra SRO will be assigned to each shift during the Power Ascension Test Program. Only 8 Reactor Operators (RO) have unrestricted licenses because the 14 newly licensed RO's are limited pending on-watch training and reactivity manipulations during the Power Ascension Program. Therefore, the licensee will initially staff a four-shift rotation during plant restart. At an appropriate point after restart, the licensee will go to a six-shift rotation of two SRO's and two RO's per shift. There are also sufficient non-licensed equipment operators to staff six shifts. STA's will work a five-shift rotation for at least the next year. These staffing levels are considered adequate.

It should not be necessary to work operators in excess of the overtime guidelines of NRC Generic Letter 82-12. Senior plant managament has been active in restricting overtime. Procedure 1.3.6.7, "Use and Control of Overtime at PNPS," [illegible] NRC guidelines, provides procedural controls for [illegible] hours, and requires advance approval of overtime. [illegible] inspector reviewed Operations Department overtime records for the period of July 6, 1988 to August 16, 1988. During this period, there were only three occasions when staff worked greater than 56 hours in a 7-day period. During this period, there was one instance of overtime in excess of NRC guidelines. This occurred August 1 and 2 when a radwaste worker worked 28 hours in a 48-hour period. This worker had approval to work up to 60 hours that week but did not have approval to exceed the 48-hour guideline. This worker is not a licensed operator and was not doing safety-related work. The licensee identified this incident and counseled the individual on overtime requirements.

3.2.4 Procedure Validation

The Team walked down Procedure 5.3.26, "Reactor Pressure Vessel Injection During Emergencies," with a non-licensed equipment operator who had been trained in the procedure. The procedure involved connecting a fire water crosstie to the residual heat removal (RHR) system. Minor procedure errors were found. A drain valve labeled 1-DR-122 in the field is referred to as 1-DR-121 and the fire water storage tank low level alarm is referred to as annunciator B-7, whereas it is actually D-3. Also, the procedure instructs the operator to "connect the local flow meter" without specifying the instrument number. The procedure was actually referring to a strainer differential pressure indicator, instrument number 33-FID-4610. The operator did not simulate connecting this instrument and when questioned by the Team, he stated that the step referred to flow meter FI 4609 which was already connected. Of more significance was confusion caused by step IV.B.2.b, which instructs the operator to install jumpers to defeat LPCI initiation and PCIS isolation signals and operate LPCI injection valves 28 and 29. The equipment operator requested the assistance of the watch engineer and the STA. These watchstanders initially felt the jumper was not needed. The jumper is not directly related to LPCI valves 28 and 29, but is needed to provide a flow path for a fire pump and to prepare for contingencies in the EOPs.

Procedure 5.3.26 was one of eight new procedures written by contractors and validated by contractors. All eight of these procedures are therefore suspect and will be revalidated by licensee operations staff before restart. All other EOP satellite procedures and other abnormal operating procedures substantially changed during this outage will also be revalidated before restart.

The licensee did not perform any QA audits or surveillances on the writing of procedures by contractors. However, the licensee has performed surveillances of the procedure validation process used on procedures other than the EOP satellite procedures. Surveillances #87-9.3-9 and #88-1.1-56 found that half of the procedures being revised and implemented in April and May 1988 were not being validated. As a result of this finding, procedure 1.3.4-4, "Procedure Validation," was issued August 15, 1988.

There were also some training aspects to this procedure issue. The equipment operator was trained on Rev. 0 of 5.3.26 which did not include the instruction to connect the local flow meter, whereas the inspector used Rev. 1. Licensed operators were trained on the control room portion of the EOP satellite procedures and equipment operators were trained in the procedural steps outside the control room. The problem with the jumpers occurred at the interface between these operators. Following the procedures revalidation discussed above, the licensee will provide additional training as needed.

During a NSRAC meeting conducted on August 2, 1988, the committee discussed an open concern on the validation and upgrade of plant procedures. NSRAC concluded that they were concerned that all of the routine operating procedures had not been validated by one of the validation processes. Following the meeting, the committee forwarded a concern to the SVP-N concerning the operating procedures necessary for long-term operation of the plant. The plant staff is scheduled to respond to NSRAC on September 14, 1988. The NRC will review this response during a subsequent inspection.

3.2.5 Temporary Modification Controls

The Team observed that current logs show that about 15 temporary modifications (TMs) are in effect, some of which date back to 1983. Fifteen is not an unusual or unmanageable number of TM's, and represents a significant reduction from previous conditions.

The Team reviewed nine TM's initiated 1987 and prior years and noted (1) only three of the nine modifications affected safety-related systems; (2) licensee safety evaluations (SE) were filed in the TM package, which demonstrated the interim configurations created were acceptable; and, (3) licensee actions to address the TM's by conversion to permanent modifications were apparently based on engineering service requests and plant design changes referenced in the TM packages. Team review of the SE's on a sampling basis did not identify any inadequacies. Further, the Team noted that reduction of the TM backlog has been a licensee priority.

Plant Procedure 1.5.9, "Temporary Modifications," allows temporary modifications to be open for six months and provides a mechanism for active TM's to be extended. However, this mechanism is typically not used. Procedure 1.5.9 does not require a review of the TM for extension of the expiration date if an engineering service request (ESR) for a permanent design change is in effect for the TM. Of seven TM's reviewed, six had ESR's and therefore did not have a current approved extension date. The inspector indicated that good engineering practice would dictate continuance of the periodic reviews for all TM's, and licensee management agreed. The licensee committed to either prepare a justification for operation for every TM that is still open prior to startup or to revise the procedure to apply the TM extension request process to all TM's, including those with outstanding ESR's.

TM 84-77 was selected for detailed followup review to assess the technical adequacy of the change on a temporary basis and to evaluate the extent and timeliness of licensee followup actions to either remove the temporary modification or convert it to a permanent change to the facility. The modification involved the replacement of an FCR-type relay in cubical 72-754 of the DC motor control center for the RCIC 1301-22 valve. The valve is in the suction path from the condensate storage tank (CST), is normally open for RCIC standby and initial operation, and will cycle closed on low level in the CST. After failure of the existing FCR relay (an open circuit coil), an HFA-type relay was installed on December 17, 1984 and made electrically equivalent to the original circuit. An HFA was used because an FCR relay was not available onsite. The change did not affect the normal function of the valve.

Engineering Service Request (ESR) 85-368, dated July 22, 1985, requested engineering to convert the change to a permanent modification, with a completion date of November 22, 1985. ESR response memorandum NED 86-1275, dated December 31, 1986, rejected the ESR request to make the change permanent because of two concerns involving the need to keep the wiring in the 72-754 cubical consistent with other DC motor control centers (MCC) and the assumed differences in the inrush and coil holding currents between the two types of relays. In rejecting the request, engineering found that the change was acceptable on a temporary basis, but recommended restoration of the original design.

A Potential Condition Adverse to Quality (PCAQ) Report (No. NED 86-110) was issued to assess the deviations. Further engineering evaluation was requested by ESR 88-080, dated January 27, 1988, with action requested by May 1, 1988. Further engineering review determined that the change would be acceptable as a permanent modification, which was made by FRN 87-80-52 to PDC 87-80 dated June 14, 1988.

The plant design change (PDC) modified the drawing to permanently document the change and addressed the seismic adequacy of the HFA relay installation. The HFA relay was not certified to be environmentally qualified since the 1301-22 valve is not on the EQ master list and environmental qualification (EQ) is not required. The PDC also addressed the adequacy of the inrush and holding current characteristics of the HFA relay. The second engineering review found the HFA current characteristics to be better than those of the FCR relay.

The Team discussed the bases for the original and final engineering determinations via telephone on August 17, 1988 with engineering (NED) . The Team noted that engineering initially rejected the proposed design change based on information indicating larger power consumption by the HFA relays, and based on a concern that, if replacement of the FCRs with HFAs became a general practice, a problem could result in the increase in DC loads. Those concerns were not realized since the FCR failure was a random one, and the operating current characteristics of the HFAs are better than initially assumed.

Based on the above, the Team identified no technical concerns with the licensee's dispositioning of the adequacy of the modification.

The Team noted that licensee action on the original 1985 ESR was not timely in either the preparation of the original ESR or the followup actions by NED in response to the site request. However, the actions to respond to ESR 88-80 and disposition the issue in 1988 were greatly improved.

The Team audited the six tag outs for TM 84-22 and found that MCC B25 was missing two TM tags. Since this is a non safety-related modification which is about to be withdrawn, this was not considered by the Team to be of safety significance. It does indicate; however, the need to periodically recheck TM tagouts.

An additional concern is that in the following example the licensee performed a TM without implementing the formal review and approval process. During a tour of the reactor building on August 8, 1988, the Team noted that reactor pressure boundary leak detection system monitors C-19A and C-19B had their doors propped open, and each monitor had a large fan tied to the opening. Investigation identified that no temporary modification had been processed to evaluate and authorize this alteration. The licensee stated that elevated temperatures in the cabinets result in failure of the monitor electronics and have been a long-standing problem. Engineering response to Engineering Service Request (ESR) 85-462 implemented a reduction in system heat-tracing temperature. This alteration did not resolve the problem, and on August 6, 1988, the licensee initiated ESR 88-558 requesting further engineering review. Monitors C-19A and C-19B are required to be operable by Technical Specifications during power operations so that some short-term action and long-term resolution are needed. Since the monitors are not currently required to be operable, the licensee has de-energized them and removed the fans pending evaluation.

In summary, even though the licensee has been aggressive in reducing the number of TM's, there have been some lapses in their control of temporary modifications. This indicates a need for continued licensee management attention to this area.

3.2.6 Required Reading Books

The Team reviewed the "Required Reading" books in the control room. The books consist of three large binders that contain procedure changes. They provide a method for promptly updating operators on plant and procedure changes. Each piece of information in the book had a sign-off sheet to ensure that all operations personnel read the material. The Team noted that information in the books dated back to April 1988 and many of the procedure changes had not been signed off as read by all personnel. This appears to indicate that the program is not being monitored routinely by operations management. Material remaining in the book for long periods defeats the purpose of providing timely information on changes to the operators. Conversely, if the changes are not important to operations personnel, it may not be necessary to put them in the books.

The Team discussed these observations with the Plant Operations Section Manager. Some improvement was noted later during the IAT inspection, as a result.

3.2.7 Logs

The Team reviewed the implementation of the Technical Specification Limiting Condition for Operations (LCO) log, the Disabled Annunciator Alarm Log, and the operations supervisor log procedures. The LCO log was implemented August 18, 1988, by Procedure SI-OP.0008, "Limiting Conditions for Operations Log," dated July 25, 1988, and was being used on a trial basis from August 8 to August 18, 1988. The only LCO entered after the log was implemented, LCO A-88-002, was properly entered, tracked, and cleared. Procedure SI-OP.008 is being revised to incorporate lessons learned in its initial implementation.

The Disabled Annunciators Alarm Log is controlled by Procedure 2.3.1, General Action Alarm Procedures, Item VII. The inspector observed eight disabled annunciator tags on control room annunciators. All eight were properly logged. However, only two of the eight annunciators had a maintenance request (MR) issued. The shift supervisor informed the Team that disabled annunciators without MRs occurred due to plant conditions and will be returned to service before startup. The licensee audits disabled annunciators monthly under preventive maintenance (PM) Procedure 8.A.24, "Audit of Control Room Annunciators and Instruments," which should assure that these annunciators are returned to service before startup.

There was little activity in the control room during this inspection, but the Team did observe the following items properly logged in the operations supervisor's log: LCO's, Failure and Malfunction Reports, a fire drill, and spent fuel pool temperatures while the fuel pool pumps were out of service for maintenance. However, as discussed in Section 3.2.8 below, changes in jumpers or lifted leads were not logged in the operations supervisor's log.

The Team concluded that log keeping practices are generally adequate.

3.2.8 Timely Update of Lifted Lead/Jumper Log

During a review of the Lifted Lead/Jumper (LL/J) procedure and program implementation on August 16, 1988, the Team identified that the log was not being maintained completely up-to-date. Eight entries in the LL/J log involved lifted leads or jumpers installed on July 14, 1988, to perform main station battery work and testing per Maintenance Work Plan (MWP) 87-46-173. All eight requests were associated with the same MWP. All log entries showed the LL/J request was still active on August 16, 1988. The Team found that the batteries had been returned to normal and LL/J request was closed out on July 29,1988, and that Maintenance Request 87-46-173 was completed on August 1, 1988, inclusive of the post-work testing. Step 5.3.1.5 of Station Procedure 1.5.9.1, "Lifted Leads and Jumpers," states that the person performing the LL/J request is to notify the Watch Engineer when the system is returned to normal by removing the jumpers or landing the lifted leads. The Watch Engineer is responsible for updating the LL/J log. The findings were referred to operations personnel on August 16, 1988 for followup.

Licensee followup review confirmed that the work had been completed and the log should have been updated. The log was updated to show the correct status on August 16, 1988. In response to the inspector's findings, the licensee conducted an audit of the log. The licensee's audit identified (1) two instances where the log had not been updated, and (2) that operations personnel were not making entries in the Operation's Supervisor log when LL/J log entries were made. These matters were referred to the Operations Section for followup and corrective action. QA followup and trending will be covered by QA Surveillance Report 88-94-61.

The licensee reported that the cause of the discrepancy was the failure of maintenance personnel to inform operations that the jumpers and lifted leads were cleared when the systems were returned to normal. Inspector interviews with the Maintenance Supervisor responsible for MR 87-46-173 noted that he failed to discuss the closeout action on the LL/J request as a result of a misunderstanding on the status of the work package closeout during shift turnover with another maintenance supervisor.

Team review concluded the inaccurate LL/J log had minimal significance and no impact on safe plant operations for these cases. There was no loss of control of the physical plant configuration. Plant operators would have reviewed the LL/J log as a prerequisite to plant restoration and startup. This review would have identified the open log entries and the completed closeout actions. Further, licensee followup to the discrepancies identified by the Team were prompt and appropriate. Based on the above, and in recognition that the jumper and lifted lead log is a new tracking system, no further NRC action is warranted at this time. This area will receive further review during subsequent routine NRC inspections.

3.2.9 Tagouts and Operator Aids

The Team reviewed the licensee's administrative controls for use of protective tagging at PNPS. The Team reviewed Procedure No. 1.4.5, "PNPS Tagging Procedure," Revision 23, which is to be implemented September 1, 1988, and noted that this procedure was revised to address concerns with tag controls identified during the licensee's self-assessment. Specifically, the procedure limits the use of Nuclear Watch Engineer (NWE) tags; prohibits the use of danger (red) tags for identification purposes on lifted leads; and requires documented monthly reviews, including field verification, of NWE, Caution and Master Danger tags and tagout sheets. The Team reviewed the NWE and caution tag logs and independently verified that several NWE, caution, danger, and master danger tags were properly filled out, properly hung, and positioned as required on the components. No discrepancies were identified. Based on this review, the Team concluded that the licensee's control of protective tagging was adequate and properly implemented.

The Team also reviewed the licensee's control of operator aids as established by Procedure No. 1.3.34, "Conduct of Operations." An operator aid is information in the form of sketches, notes, graphs, instructions, or drawings used by personnel authorized to operate plant equipment. The Team reviewed the operations and chemistry operator aid log and determined that it was maintained in accordance with the procedure. The Team noted that periodic licensee reviews and verification of the need for and placement of operator aids were documented. The Team independently verified proper posting of selected operator aids, and no unauthorized aids were identified during the Team's plant tours. Based on this review, the Team concluded that the licensee's control of operator aids was adequate.

3.2.10 Plant Tours and System Walkdowns

3.2.10.1 Miscellaneous Tour Observations

The IATI Team made frequent plant tours. The overall material condition of rooms and equipment was excellent. Particularly notable was cleanliness, fresh paint, and obvious decontamination efforts to make major portions of plant and equipment accessible. Component labeling and tagging was very good.

The Team observed activities in progress. Persons interviewed on tour (HP, security, operations contractor) had experience in their positions and were knowledgeable about their work and duties. HPs were cognizant of work activities in progress. Housekeeping controls were being maintained during work in progress.

The Team reviewed the status of indicators and controls on selected local panels. Controls and indications were operable and no deficiencies were noted. Operating procedures required to be posted at the local panels were available and adequate, based on Team review.

The Team observed loose cable tray covers including one that was laying on top of an in-place cover. The licensee reviewed this finding and documented the review and corrective actions in an engineering "white paper." This review determined that loose covers do not compromise the design but that covers laying on top of in-place cable tray covers could be a seismic concern. The misplaced cover found by the Team was determined to not be needed. The licensee surveyed cable trays throughout the process buildings and found additional loose covers but no more that were completely unfastened and laying on top of other covers. Corrective actions completed include refastening the loose covers, removing the misplaced cover, revising procedure SI-SG.1010, "Systems Group System Walkdown Inspection Guideline," to use periodic walkdowns by the system engineering division to identify seismic concerns, such as misplaced tray covers, and preparing F&MR No. 88-200, which will be used to determine how to keep future maintenance and modification work from creating loose or misplaced covers. The Team concluded that the licensee's response to this issue was thorough and adequate. The Team considers this issue resolved.

3.2.10.2 Diesel Generator Walkdown

A walkdown of the 'A' diesel generator (DG) was completed on August 15, 1988, to verify operability and standby readiness of the emergency power supply, and to observe the general conditions in the DG area. The valve checkoff lists of Procedure 2.2.8, "Standby AC Power System (Diesel Generators)," were used as acceptable criteria to establish the proper system valve positions. The procedure checklists were also reviewed for adequacy against Drawings M219 and M224, and by comparison with the physical plant during a walkdown of the diesel skid and room. Proper valve lineup was verified for the DG fuel oil and air start systems. This review confirmed that the 'A' DG was operable in the standby mode.

Cleanliness and the general condition of equipment and components in the diesel rooms were excellent. Valve and component identification (tags) and labeling were very good and showed significant improvement in performance in comparison to past reviews. Several minor discrepancies were noted, as follows: (1) identification tags were missing on valves 104C and 118, and the tag was loose on valve 105C; (2) valve 118 was required to be locked in the closed position and a chain and padlock were provided for this purpose; however, the chain was sufficiently loose that the Team would have been able to defeat the lock and thereby move the valve; (3) the inner fire door granting access to the 'A' DG skid had worn and damaged gaskets along the closing surface and the door latching mechanisms (dogs) were misaligned with the position indicators; (4) no permanent lighting was installed in the 'A' and 'B' diesel day tank rooms -- lighting, if installed, would aid operator reviews during plant tours; and, (5) two isolation valves for pressure switches 4555A and 4556A were not labeled with an ID tag in the plant and were not identified on system drawings or procedures. The valves were properly positioned. Additionally, proper valve position is demonstrated indirectly during the monthly functional test of the diesel air start system.

These discrepancies were noted by the Nuclear Plant Operator accompanying the Team and were discussed with the duty Watch Engineer. Actions were taken to document and correct the discrepancies, including the issuance of Maintenance Request 88-61-83 for the fire door. Inspector followup review on August 16, 1988 confirmed that actions were in progress and had been completed to correct the tag on valve 105C and to properly lock valve 118. Licensee response to the Team's findings was appropriate and timely. No other inadequacies were noted.

3.2.10.3 Standby Liquid Control System Walkdown

The Team walked down the standby liquid control (SBLC) system using the valve checklist in Procedure No. 2.2.24, "Valve Lineup for Standby Liquid Control System," and piping and instrument diagram (P&ID) M-249. This review was performed to verify the adequacy of the procedure checklist and P&ID, evaluate the valve labeling, evaluate the control of locked valves, verify the operability of instrument and support systems, and assess the overall material condition of the system and general cleanliness of the area. The Team noted that the checklist control of vent and drain capped connections differed from other safety system procedures, such as those for the residual heat removal (RHR) and core spray (CS) systems. For example, an outboard vent valve on the CS checklist would be "locked, closed and capped." The SBLC procedure only checks "locked, closed." No deficiencies with capped connections were noted, however. The Team also noted that the vent valve for pressure indicator (PI) 1159 was not on the valve checklist. The licensee agreed to review these observations to determine if the procedure needed to be revised. No other deficiencies or concerns were noted.

Overall, the Team found the valve labeling, material condition, and general cleanliness to be excellent.

3.2.11 Conclusions

The operations staff conducted their activities in a professional manner. Operators were knowledgeable about their duties and about plant status. The depth of experience and knowledge of senior licensed operators is a strength and will be a major asset during restart. Shift turnover briefings by individual operators and for the shift are thorough; however, non-operations shift workers do not routinely attend these briefings. Site management involvement in operations was evident by their frequent presence in the control room. Shift staffing levels are adequate and plant housekeeping was excellent

A weakness was noted in the validation and/or training of EOP satellite procedures. The licensee's commitment to confirm effective implementation of EOP satellite and off-normal procedures before restart is responsive to NRC concerns. Administrative controls and log-keeping practices are generally adequate, although required reading materials are not being reviewed by all personnel on a timely basis. There are lapses in the licensee's control of temporary modifications, particularly the absence of periodic reviews and scheduled completion dates for temporary modifications covered by an engineering services request.

3.3 Maintenance

3.3.1 Scope of Review

The licensee's maintenance program has undergone significant change during the past several months. Weaknesses had been identified during the SALP period ending May 15, 1988, and by Special NRC Maintenance Team Inspection 50-293/88-17. During the present inspection, the licensee's maintenance policies and program procedures were reviewed. Maintenance activities were evaluated during the planning, implementation, post-work testing and closeout stages. Emphasis was placed on direct observation of ongoing work in the field. Interviews were conducted with personnel at each level within the maintenance department to determine their depth of understanding of program goals. The Team also assessed the size and significance of the licensee's maintenance backlog, and reviewed established licensee performance indicators.

3.3.2 Observations and Findings

3.3.2.1 Management Policies and Goals

The Team reviewed the licensee's Mission Organization and Policy Manual, Nuclear Operations Procedures Manual, and Maintenance Section Manual. These documents describe the licensee's policy and performance goals for the maintenance program. The licensee has also established the Material Condition Improvement Action Plan (MCIAP). The MCIAP, which is described in the licensee's Restart Plan, is designed to achieve long-term improvement in the maintenance program. In addition, maintenance performance indicators are being used by the licensee to evaluate the success of recent program changes and the allocated maintenance staff has been increased significantly. Interviews with maintenance personnel at various levels within the department indicate that the organization and management policies are generally well understood.

3.3.2.2 Organization and Staffing

The maintenance organization and staffing levels were reviewed. Interviews were conducted with division supervisors and staff personnel to determine whether organizational relationships were well understood. The current staffing status was evaluated, particularly in the supervisor, maintenance engineer, and planning positions, to determine whether staffing levels were adequate, responsibilities clearly defined, and resources effectively used.

The maintenance section consists of three production divisions (electrical, instrumentation and control and mechanical), plus a planning division and an engineering group. All division manager positions and all first-line supervisor positions in the production divisions are filled with licensee employees, except for two positions in the equipment tool room, which are presently filled by contractors. Increased staffing at the craft level in the production divisions has been authorized. Instrumentation and Control (I&C) will increase from 22 to 30 positions; Electrical Maintenance will increase from 14 to 18 positions; and Mechanical Maintenance will increase from 27 to 33 positions. Staffing of the planning division has not been completed. Twelve contractor personnel are presently being used to perform the planning function, with assistance from the licensee's outage management group. This arrangement is performing acceptably, as described in Section 3.3.2.4.

Team interviews with supervisors and craft employees showed that personnel clearly understand the new program and their area of responsibility. The interviews covered personnel with a wide range of experience in their positions, including those newly assigned. The Team noted; however, that the recently revised job descriptions for the section have not been disseminated to the staff. The Maintenance Manager stated that they would be issued in the near future.

Two positions in the new maintenance section organization, the Deputy Manager and the Radiological Advisor, are effectively being used. The Radiological Advisor is a permanent staff position and provides a focus for interface with the Radiological Protection Group. Team observations indicated that the Deputy Manager was effective in scheduling and coordinating activities through his interface with other sections.

The Team's review indicated that licensee staffing is ample to meet targeted production goals without reliance on the use of excessive overtime. While some variations occur, the percent of overtime worked has been at or slightly above the operating goal of 20%, which equals a 48-hour work week. Work schedules for craft and supervisory personnel provide 1 day off in a 7-day period. The maintenance staff is working primarily on the day shift, with night shift coverage provided for certain critical jobs in progress. The licensee plans to provide around-the-clock 8-hour shifts that will match the Operations Section rotating shift schedule, beginning with plant startup. Maintenance shift coverage will continue through the power escalation sequence and on a reduced scale afterwards. Licensee staffing is sufficient to staff the shift schedule without reliance on excessive overtime.

New personnel assigned to the division manager and production supervisor positions have adequate prior experience in related assignments. The Team's observations of the first- and second-line supervisors in conducting their daily activities showed that the supervisory, oversight, and control functions were effectively performed. Based on these observations, the Team concluded that the newly hired supervisory staff does not have a negative impact on the quality of control over maintenance activities.

In summary, identified strengths in the present maintenance section organization include the use of the Deputy Manager and the Radiological Advisor. The increase in supervisory positions in the production divisions has been effective in increasing oversight and control of work activities. While temporary staffing of the planning division with contractors is sufficient and provides for an effective planning function (as measured by the quantity and quality of maintenance packages produced), plans to staff these positions with permanent licensee employees by October 1988 should remain a management priority to assure timely integration of the planning and scheduling functions. Management has controlled overtime for the craft and supervisory positions. Plans to provide for maintenance staffing during and after restart on an 8-hour rotating shift basis should provide continued effective overtime control.

3.3.2.3 Communications and Interfaces

Communication between the maintenance department and other portions of the organization, particularly operations and radiation protection, had previously been a weakness. The licensee has taken successful steps towards improving communication, both internal to the maintenance department and with other station groups.

The Team attended a variety of maintenance department status and turnover meetings. Based on observation of these meetings and interviews with maintenance personnel at each level of the organization, the Team concluded that communications internal to the maintenance staff are effective. Maintenance department managers were cognizant of the status of activities and of emerging problems.

The licensee has initiated several programs directly addressing the past weaknesses in interdepartment communications. In an effort to improve the interface with radiation protection and to raise worker sensitivity to health physics issues, the licensee created and staffed the maintenance Radiological Advisor position. Interviews with a spectrum of individuals indicated that this effort has had a positive impact on day-to-day working relationships and performance. The licensee also formed the Work Prioritization Review Team (WPRT), composed of representatives of various station departments. The WPRT provides a forum for discussion of the relative importance of each maintenance item as it arises. The WPRT has been effective in improving operation's department involvement with the maintenance process. The maintenance department is also involved in daily and weekly meetings intended to ensure coordination between station groups. Meetings attended by the Team were generally effective.

. The need for continued efforts to improve communications and interfaces were noted in some areas. The licensee's Stores Department practices are not always fully supportive of specific maintenance department needs. For example, lubricating oil can only be withdrawn in bulk quantities, such as a 55-gallon drum. Typical maintenance activities require use of only a fraction of this amount. Similar restrictions apply to materials routinely used by the I&C, electrical, and mechanical maintenance divisions. This policy places the burden for control and storage of unused material on the individual requesting the withdrawal. The Team noted that maintenance personnel were routinely using a cabinet in the maintenance shop to store unused "Q" materials. No procedure existed to specify the appropriate controls for the storage area. The need for establishment of the storage cabinet had been discussed previously between the Quality Assurance Department (QAD) and maintenance. QAD believed that the cabinet was not currently in use, while maintenance personnel believed that QAD had concurred in its creation, demonstrating a lapse in interdepartment communications. The licensee subsequently performed an inventory of the materials in the cabinet, and removed all non-Q and suspect materials. Procedure 3.M.1-32, "Control of 'Q' Hold Area," was subsequently issued to provide appropriate controls and surveillance of the cabinet.

The Team also noted that partially used drums of both Q and non-Q lubricating oil and grease were being kept in a storage shed outside the process building. Several of the drums were not properly sealed. No procedure addressing this storage area existed. Discussions with operations personnel indicated that the difference between Q and non-Q drums of material was not clearly understood. Routine withdrawals and their equipment application were not recorded. In response, the licensee removed all non-Q materials and committed to issue a procedure to establish appropriate controls by September 7, 1988, including provisions to ensure that the lubricants are traceable to their application in the field. In addition, the licensee committed to evaluate the possible addition of non-Q oil to Q equipment and its potential significance.

During followup to this issue, the Team reviewed Engineering Specification M-547, which documents the procurement and receipt inspection requirements for the purchase of lubricants as a Commercial Quality Item (CQI). The Team noted that M-547 requires sampling and testing of each batch of material purchased as a CQI. At the Team's request, the licensee reviewed records and identified two cases in which a CQI procurement order had been issued which did not invoke this sampling requirement. The licensee subsequently issued a Potential Condition Adverse to Quality (PCAQ) to initiate a review of CQIs issued for consistency with approved engineering specifications. The licensee committed to disposition this PCAQ prior to restart.

Overall communications between the maintenance department and other groups within the organization are effective. However, the interface problems discussed above, among the Stores Department, QAD, and the Maintenance Department, indicate that continued attention is needed.

3.3.2.4 Maintenance Planning and Prioritization

The licensee has established a Maintenance Planning Division within the Maintenance Department. The role of the Planning Division is clearly delineated in approved maintenance procedures and the licensee's Maintenance Section Manual. The Planning Division Manager position has been filled and the licensee is actively pursuing candidates for the eight allocated staff positions. When staffing efforts are complete, the division will consist of a work package planning group and a scheduling group. In the interim, the licensee is utilizing twelve contractor personnel to perform the package planning function. The licensee's Outage Management Group (OMG) is currently providing scheduling guidance. The licensee expects to complete the staffing effort by October 1988. Team reviews indicate that the present staff of contractors, in conjunction with OMG assistance, is functioning well.

Implementation of the revised maintenance work process, particularly the need to generate detailed job-specific maintenance work plans (MWP) for each maintenance request (MR), has resulted in a heavy emphasis on the planning function. The Team reviewed a large sample of completed MWP's, and MWP's in the field. Interviews with craft personnel and first-line supervisors indicated that these individuals were knowledgeable about the new maintenance process requirements and considered MWP's issued by Planning to be of generally good quality. One weakness was noted in the area of post-work testing specification, as discussed in Section 3.3.2.6.

The Team noted that the completion of job planning, and approval of the MWP are typically restraints to commencement of the activity. This results in the need to expedite the review process, making scheduling difficult. It appears that this is primarily attributable to the newness of both the program and the Planning staff. Other factors also contribute. For example, the licensee's procedures currently do not provide a simplified process for non-intent changes to the

MWP after issuance. MWP's require a complete re-review to incorporate minor changes. The licensee stated that a revision to the program to include provisions for non-intent changes is planned for the future. The licensee's engineering department is presently reviewing each MR/MWP and approving the use of any replacement materials. This practice provides positive control of all materials, but delays issuance of the MWP and is a significant drain on engineering resources. While these factors inhibit efficient planning, no instance of inadequate planning was identified.

The licensee has created a WPRT to assist in the assignment of the proper priority to each MR. The WPRT meets daily and is composed of representatives of various station groups, including maintenance, operations, outage management, construction management, and fire protection. It performs a multi-disciplined review of new maintenance items to identify potential plant impact. The IATI Team attended a WPRT meeting and observed that discussions were properly focused and priorities were assigned appropriately.

The Team also independently reviewed outstanding maintenance requests for the RHR system and the electrical distribution system. This review focused on MR's not designated for completion before restart. The Team noted that MR 88-10-105 documented electrical ground and potential cable insulation damage in the circuit for pressure switch PS-1001-93A. This switch is environmentally qualified (EQ) and provides a safety-related interlock function for the automatic depressurization system. The MR had been scheduled for work after restart, leaving the switch EQ in an indeterminate state. In response to the Team's question, the licensee rescheduled the MR for completion prior to restart.

The Team also noted that MR 88-10-26 documents that valve AO-8001 is currently open and cannot be closed using the hand switch. AO-8001 is installed in series with a check valve in the torus fill line. The check valve satisfies the primary containment isolation function for the line. While AO-8001 is not required for containment isolation operability, it does serve as a redundant isolation valve immediately adjacent to the check valve. AO-8001 was originally designed to receive an automatic open signal on sensed low torus level. Because normal torus level is now maintained below the instrument low level setpoint, the valve continuously receives an open signal, thus preventing manual closure. This condition has existed for at least several years. The licensee has relied on closure of a manual block valve located in the turbine building to compensate for the problem. The Team expressed concern that the distance between the containment isolation check valve and the redundant isolation valve have been unnecessarily extended outside the reactor building. In addition, a lineup that is inconsistent with the design drawings and operating procedures resulted. The WPRT had designated this MR as post-restart. In response to the Team's concerns, the licensee initiated an Engineering Service Request (ESR) to identify an acceptable repair. The licensee committed to resolve this item prior to restart.

These two examples of misscheduled MR's were discussed by licensee management with the WPRT. In addition, the licensee committed to re-evaluate all priority 3 MR's before restart. The licensee's process for review and prioritization of MR's is thorough, and with the exception of the two instances described above, appears well implemented. The effectiveness of the licensee's planning and prioritization program is demonstrated by the overall decrease in the number of outstanding maintenance tasks, their average age, and their significance.

The licensee tracks several maintenance performance indicators which are indicative of backlog status. Those performance indicators generally display a favorable trend. The Performance Indicator Report for August 9, 1988, shows a total backlog of 2177 open MR's, of which 746 are in a test/turnover status. Of these, 220 cannot be tested until the plant system becomes operable during startup. Of the 1431 remaining open MR's, the licensee has identified 652 required for restart. The physical work had yet to be done for 145 of these 652 MR's. Based on the above, and an average closeout rate of about 25 packages per week, elimination of the restart backlog within 6 to 7 weeks appears to be manageable effort. The licensee's goal, in addition to addressing the restart MR's, is to reduce the total number of open MR's from 1431 to less than 1000 by plant restart. The Team noted that this would constitute an acceptable open MR backlog for an operating plant, and that the licensee's goal was reasonable.

3.3.2.5 Control and Performance of Maintenance

Inspection in this area was performed to determine whether maintenance activities are being properly controlled through established procedures, and the use of approved technical manuals, drawings and job-specific instructions. Maintenance activities were observed to determine how well the new program was being implemented.

The new maintenance program is primarily defined in Procedures 1.5.3, "Maintenance Requests," and 1.5.3.1, "Maintenance Work Plan," which were implemented on June 20, 1988. The procedures were reviewed and found to provide strong controls for identification, planning, performance, and closeout of maintenance tasks. Issuance and control of materials used for replacement/repair assure that requisite quality requirements are maintained. Supervisory oversight of work in progress and the final review of work packages for completeness is a strength. Based on its review of the above procedures and observations of work in progress, the Team concluded that the newly defined program provides excellent control and documentation of activities.

The new program and procedures formalize controls that were previously in place, but inconsistently applied and not recognized by procedures. The procedures now require better documentation of the initial problem description, the repairs made, and the post-work test requirements. They require detailed work instructions, which should provide for consistent high quality in maintenance work packages. An additional improvement in the maintenance procedures is that the maintenance work plan now provides for detailed documentation of installation and removal of lifted leads and jumpers (LL/J). This documentation assures proper performance of the task and is supplemented by the tracking provided in the LL/J Log initiated by the Operations Department per Procedure 1.5.9.1.

To eliminate a previously identified weakness, the licensee has stopped using Procedure 3.M.1-11, "Routine Maintenance," which was found to be too general to adequately control work activities. Instead, detailed work instructions are provided by the work plans prepared in accordance with Procedure 1.5.3.1. Further, the licensee has stopped using the Maintenance Summary and Control (MSC) form. The documentation provided by the form has been replaced by the detailed work plans, maintenance logs, and special process control sheets now required by Procedures 1.5.3 and 1.5.3.1.

The maintenance activities and packages listed in Appendix D of this report were reviewed to verify proper implementation of program requirements. The Team found that detailed work packages were prepared and in use in the field with adequate job specific instructions to accomplish the assigned tasks. No ad-hoc changes of the work scope were observed. Pre-job briefings were conducted and were appropriate to outline the activities planned. Coordination and in-process communications with operations personnel were proper and assured good control of plant equipment.

Maintenance personnel, including contractors, have been trained in and were knowledgeable about the new program and procedure requirements. Although the new controls were deemed cumbersome by some, overall worker attitudes about the new procedures were positive. There is a general acceptance of the present program and a desire to "do the work right." Personnel performing the work were qualified, as verified by the training and qualification status board maintained in the maintenance shop.

The licensee has made progress in filling vacancies in the first-line supervisor positions with personnel having the requisite experience and expertise in the associated disciplines. The present supervisory staffing is adequate to cover work production schedules and provides adequate oversight. In an additional program improvement, supervisor review of work packages is now required by procedure to assure management review of packages for completeness. First-line supervisors were routinely observed in the field directing work in progress. Supervisory involvement was effective to assure completion of work correctly, to help resolve technical problems, and to coordinate engineering support, as required. The oversight function has been enhanced by the larger number of first-line supervisors who have been relieved of the excessive administrative burden associated with planning and package preparation.

The effectiveness of maintenance staff engineers and system engineers in supporting field activities was particularly noted in the repairs for the fuel pool cooling pump and the repair of RHR discharge valve 28B. The engineers are also used in the root cause analysis of component failures. The repair of valves 28A and B involved the fabrication of new valve yokes, which resulted in a large and complicated work control process that was appropriately broken down into several work packages. Oversight and control of these jobs, which spanned several weeks, were notable. The quality of the final product was evident, as was the welding of the yoke subparts. Good inprocess controls resulted in an acceptable root weld on the first attempt for valve 28B. Although a problem was encountered in the fabrication of the yokes (short by 3/8 inches), this item, considered minor, was properly dispositioned by the licensee through Nonconformance Report (NCR) 88-99.

3.3.2.6 Post-Maintenance Testing Program

The licensee's program for identification and implementation of post-maintenance testing was considered weak during previous inspections. During the current period, the Team reviewed the licensee's post-maintenance testing program procedures and other approved test technical guidance. A sample of maintenance tasks was reviewed to determine if planned testing adequately demonstrated correction of the cited deficiency. Testing was observed in the field, and completed test documentation was reviewed for thoroughness.

The licensee recently implemented a major revision to Procedure 3.M.1-30, "Post-Work Testing Guidance." The current revision establishes a conservative philosophy designed to ensure that prescribed testing verifies correction of the original deficiency, as well as potential problems which could have resulted from performance of the task. Organizational and individual responsibilities are clearly defined. Procedure 3.M.1-30 incorporates by reference Station Instruction SI-MT.0501, "Post-Work Test Matrices and Guidelines." SI-MT.0501 serves to further define the method by which post-work testing is to be specified and documented. It includes an individual matrix for each type of component describing the possible maintenance tasks and the corresponding post-work test requirement. Each matrix references an appropriate data sheet which provides more detailed testing guidance. Procedure 3.M.1-30, in conjunction with SI-MT.0501, is to be used by the Maintenance Planning Division, with needed technical input from other maintenance department and systems engineering department personnel, to establish comprehensive testing requirements for each maintenance request. The testing program as described in these documents is well conceived and is considered a strength.

The Team reviewed a sample of ongoing mair enance tasks and evaluated the technical ade…acy of prescribed testing. In three of the examples reviewed, the planned testing was not adequate to ensure proper performance of the task and complete correction of the problem:

(1) Testing identified for the replacement of the fuel pool cooling pump and motor under MR 86-109, included only motor current and vibration monitoring. No pump head/flow test was specified.

(2) The package for replacement of a safety-related 4160-VAC bus lockout relay under MR-88-110 initially contained only the general guidance which should have been used for development of detailed testing. Subsequently, suggested testing verified only a portion of the lockout relay functions.

(3) Post-maintenance testing following repair of a motor operated valve limit switch under MR 88-10-179 was also not adequate to ensure that the problem had been completely corrected.

In response to the Team's findings, the licensee Maintenance Section Manager audited task-ready MR packages and identified one additional case of inadequately specified testing. In each of the above instances, the licensee subsequently developed and performed adequate post-work tests. Discussion with the personnel involved and maintenance department management revealed that no training on the newly developed post-work testing procedures and guidance had been conducted. The licensee immediately briefed appropriate supervisors and workers on the program, and committed to complete formal training in this area by September 9, 1988. A second potential contributor to the problem in planning post-work tests is the press of business, particularly in the planning area, in that the planners are currently just able to keep pace with the schedule for field activities. Licensee management appeared to be sensitive to this issue. The Team reviewed an additional sample of in-process and completed MR's and did not identify any further problems.

Overall, the Team concluded that the licensee has established a thorough post-work testing program demonstrating a sound safety perspective. Although the program is generally well implemented, some problems were noted. The newness of the program, the current press of business, and some weakness in personnel training appear to be affecting its implementation. Therefore, this area requires continued licensee attention.

3.3.3 Conclusions

The licensee has established a viable maintenance organization. Allocated staffing levels have been substantially increased and are sufficient to support routine maintenance activities. Of particular significance is the addition of first-line supervisory positions, and the creation of an expanded maintenance planning and scheduling division. The licensee has been largely successful in filling previously vacant positions. One exception is the staffing of the maintenance planning division. While none of the permanent staff in this area is in place, the licensee is effectively utilizing contractors to perform the function. Full staffing and training of the planning division is important to improving its overall effectiveness. Aggregate management and supervisory qualifications were also found to be adequate.

Newly revised maintenance and post-work testing program procedures provide significantly improved control and documentation of field activities. They also result in an increased emphasis on detailed job planning. Observations by the Team indicate that implementation of the program is generally effective. Some implementation problems are evident; however, the problems affect production and not the quality of completed work. Additional attention to post-work test program application by the licensee is needed.

The licensee appears to have identified and properly prioritized outstanding maintenance tasks, with only minor exceptions noted. A process to ensure continued proper prioritization has been established. Both licensee senior management and maintenance section management are using a set of indicators to monitor performance.

In summary, the licensee's current maintenance staff and program are adequate to support plant operations. Continued close licensee management monitoring of the newly implemented program will be required until additional experience is gained. The long-term support programs, such as preventive maintenance, will require licensee enhancement to further strengthen performance.

3.4 Surveillance Testing and Calibration Control

3.4.1 Scope of Review

The Team reviewed the licensee's administrative controls and implementation of the surveillance testing and calibration control program to assess its adequacy. As part of this review, the Team examined the licensee's corrective action to address past problems which included: effectiveness of test scheduling; the technical adequacy of procedures: and lack of centralized control of the program. The inspection consisted of a review of various procedures, drawings, and records; observations of testing in progress; and personnel interviews.

3.4.2 Observations and Findings

3.4.2.1 Master Surveillance Tracking Program

The Team reviewed the licensee's program for the control and evaluation of surveillance testing and calibration required by the Technical Specifications (TS), inservice testing (IST) of pumps and valves required by 10 CFR 50.55.a(g), and calibration of other safety related instrumentation not specified in TS. The program is prescribed by Procedure No. 1.8, "Master Surveillance Tracking Program." The Systems Engineering Division Manager has overall administrative responsibility for the Master Surveillance Tracking Program (MSTP). A plant Surveillance Coordinator has been assigned within the Systems Engineering Division to implement the program, which includes reviewing and approving the various lists, schedules, and reports generated by the MSTP, and maintaining the MSTP data base. Each division has appointed a Division Surveillance Coordinator to interface with the plant Surveillance Coordinator. The plant Surveillance Coordinator meets weekly with the Plant Manager to review the status of the surveillance program.

The purpose of the MSTP is to ensure the timely performance of all surveillance testing. The MSTP data base contains information such as: commitment reference (TS, preventive maintenance, regulatory commitment, etc.); the applicable procedure number and title; scheduler interval and basis; the group responsible for performing the test/calibration; and the date last performed, the next due date, and the last date by which the surveillance test must be completed (plus 25% date). Completed tests are rescheduled to ensure the combined grace period for any three consecutive tests does not exceed 3.25 times the specified surveillance interval. The accuracy of the data base was verified by a contractor during the current outage. Procedure No. 1.8 contains specific controls on changing any of the data fields in the MSTP data base to maintain its accuracy. In addition, a second contractor verification of the MSTP data base is scheduled to be performed in the near future. The Team selected several TS-required surveillance tests to ensure that they are in the MSTP data base, that approved procedures existed, and that the test frequency was proper. No discrepancies were identified with the data base during the Team's review; however, the Team was concerned with a potential problem involving the scheduling of once-per-operating-cycle versus once-per-refueling-outage tests, as discussed below.

As part of its review, the Team examined the process established by Procedure No. 1.8 to determine its adequacy in ensuring that surveillance tests were properly scheduled and performed within the required time period. A "Division List" is issued to each division and to the Control Room Annex each Friday which provides a schedule of tests due for performance the following week. A "Monthly Forecast" is also issued weekly to assist the Section Managers in planning and scheduling resources. When a surveillance test is satisfactorily completed, the Control Room Annex copy of the Division List is signed off. Daily, the Planning and Scheduling Division transcribes the completion dates and updates the MSTP data base. A "Surveillance Day File Report" is issued daily to identify all changes made to the MSTP data base since the last time the report was issued. This report is reviewed by the Plant Surveillance Coordinator and used to verify proper transcription and data entry. "Variance Reports" are issued weekly to Section Managers to identify those surveillance tests that were scheduled, but not performed. A written explanation as to why the tests were not performed within the required time and why it's acceptable not to perform the test is sent to the surveillance coordinator within 24 hours of receipt of the Variance Report. A "Priority Notice" is issued for any surveillance test that has reached its deadline date (plus 25% date) and that has not been performed by that date to assist in the prevention of TS violations. Failure to perform a TS-required surveillance test on the deadline date requires submission of a Failure and Malfunction Report. The Team reviewed samples of each of the above reports, and their responses, and concluded that the program was adequate and contained sufficient checks to ensure that surveillance tests were completed within the required time.

Although the Team found the administrative control and implementation of the MSTP to be adequate, it noted a commitment by licensee management to improve the program. These improvements include: replacing the Division Lists with task cards to reduce the potential for transcription errors; adding an alert notice when a scheduled test is not performed; improving the scheduling of conditional surveillances; planning for the addition of a full-time surveillance engineer; and instituting an equipment history computer program capable of trending surveillance/calibration results on individual components.

The Team identified one concern during its review related to the scheduling of once-per-operating-cycle versus once-per-refueling-outage surveillance tests. The Pilgrim Technical Specifications define an operating cycle as the interval between the end of one refueling outage and the end of the next subsequent refueling outage. A refueling outage is the period of time between the shutdown of the unit prior to refueling and the startup of the plant after that refueling. The TS contains some surveillance requirements that are specified to be performed once per operating cycle, while there are others, such as testing the drywell-to-suppression-chamber vacuum breakers, which are to be performed during each refueling outage. Also, all the safety-related instruments not specified in the TS are calibrated once per refueling outage. As part of a previously identified issue, the licensee has defined once-per-operating-cycle to be 18 months; however, no clarification has been provided for once-per-refueling-outage. As a result, there are several once-per-refueling-outage tests/calibrations which were performed in 1986 and 1987 which are currently scheduled on the MSTP for the "next refueling outage," which is projected for some time in 1991.

Therefore, by strictly interpreting the definitions, the interval for some of the once-per-refueling-outage surveillance tests could be as long as four or five years. The Team pointed out that this appears to be beyond the intent of the TS. The Team also noted that a licensee task force established to determine system operability prior to restart had also identified this issue and recommended that evaluations be performed on the once-per-refueling-outage surveillance tests to determine if and when they should be reperformed. The licensee committed to evaluate the status of the once-per-refueling-surveillance tests and provide justification for those tests not rescheduled, prior to restart.

3.4.2.2 Logic System Functional Test and Simulated Automatic Actuation Procedures

The Team reviewed the procedures listed in Appendix D of this report to determine the adequacy of the licensee's performance of logic system functional tests (LSFT) and simulated automatic actuations (SAA). The review consisted of the indicated channel/train of the primary containment isolation system (PCIS) and the reactor core isolation cooling (RCIC) system LSFT and SAA, and the diesel generator (DG) initiation LSFT. The procedures were reviewed against the system drawings to ensure that they were technically adequate, that all relays and contacts were tested, that the procedures were properly approved, and that the tests were performed at the required frequency. The licensee uses a series of overlapping tests to satisfy the LSFT and SAA. The Team noted that the licensee had a contractor review the adequacy of the LSFT and SAA tests during this outage. The contractor identified several deficiencies, which were corrected. The Team found that each procedure reviewed was technically adequate and that the testing sequence satisfied the Technical Specification LSFT and SAA frequency and scope requirements. The Team also noted that the format of the procedures was adequate and included: environmental qualification quality control (QC) witness points on transmitter calibrations; double verification on lifting and landing leads; fuse holder fit checks; and I&C management review upon test completion prior to the NWE review.

During the review of the RCIC isolation subsystem LSFT, the Team questioned why there was no LSFT on initiation logic. The Team acknowledged that it was not required by TS Table 4.2.B, nor was credit taken for it in the FSAR. However, TS 3.5.D.1 requires RCIC be operable (with reactor pressure greater than 150 psig and coolant temperature greater than 365 degrees F) and the TS definition of system operability requires that all subsystems also be operable. This would include the RCIC initiation logic. Also, the guidance provided by the Standard Technical Specifications indicates that an LSFT on the RCIC initiation logic should be performed every six months. The Team noted that Procedure No. 8.M.2-2.6.7, "RCIC Simulated Automatic Actuation," actually performs an initiation logic LFST; however, it is scheduled at a once-per-18-month frequency, while TS-required LSFT's have a frequency of once per 6 months. This item is unresolved pending a licensee evaluation of the adequacy of the RCIC initiation logic LSFT frequency (88-21-02). The licensee committed to provide, before restart, the technical basis for the surveillance frequency.

3.4.2.3 Calibration Procedures

The Team noted that the licensee established a series of procedures, known as the 8.E series, to calibrate the safety-related instrumentation not specified in the Technical Specifications. This instrumentation is normally used to record data necessary to complete TS-required surveillance tests or inservice testing of pumps and valves. The 8.E procedures are scheduled on a once-per-refueling-outage interval.

The Team performed a detailed review of Procedures No. 8.E.11, "Standby Liquid Control System Instrument Calibration," and 8.E.13, "RCIC System Instrument Calibration." Overall, the Team found the technical content and format to be adequate; however, two discrepancies were identified. Procedure No. 8.E.11 does not calibrate pressure indicator (PI) 1159. This PI was installed during the current outage and is used in the performance of Procedure No. 8.4.1, "Standby Liquid Control Pump Operability and Flow Rate Test." The Team also noted that Procedure No. 8.E.13 does not calibrate PI 1340-2. This PI is used in the performance of Procedure No. 8.5.5.1, "RCIC Pump Operability Flow Rate and Valve Test @ 1,000 psig." PI 1340-2 was installed and last calibrated during the 1984 outage when pressure transmitter 1360-19 was replaced with a Rosemount Transmitter. The licensee indicated that the procedures would be revised to correct the deficiencies.

3.4.2.4 Surveillance Test Observations

On August 16, 1988, the Team observed a portion of the performance of Procedure No. 8.M.2-2.10. 1-5, "Core Spray System 'B' Logic Functional Test," Revision 13. The test was performed as part of the restoration of the "B" Core Spray System and as post work testing of relay 14A-K20B. The test was observed to ensure it was performed in accordance with a properly approved and adequate procedure. During the test, the Team noted that the technicians' performance was adequate. They conducted the test in a slow and deliberate manner and stopped when questions arose concerning mislabelled nameplates and the identification of some relay coil leads. In both cases, the questions were resolved before they proceeded. The Team noted that the I&C first-line supervisor monitored portions of the test. The test was also monitored by QA personnel as part of the surveillance monitoring program. QA personnel indicated that they observe approximately one surveillance test a week.

The test was stopped at Step 25 when the test results did not agree with the expected results delineated in the procedure. The step was supposed to verify the instantaneous pickup of the core spray pump start relay 14A-K12B. Subsequent licensee investigation revealed that the instantaneous pickup was removed as part of the degraded grid voltage modification (Plant Design Change (PDC) 88-07). The Team noted that PDC 88-07 had not yet been closed; however, an impact review performed prior to installing the modification failed to identify Procedure 8.M.2-2.10. 1-5 as being affected by the PDC.

The Team noted that one of the licensee's self-assessment action items was to review the impact of PDC's (installed since October 1987) on LSFT's. The licensee's review began on October 1987 because this was the completion date of the contractor review noted above which verified the adequacy of LSFT/SAA tests. The Team noted that the contractor review produced an LSFT/SAA data base which cross references the safety-related components tested to the applicable LSFT/SAA test. This data was being used during the licensee's review. Four of the five PDC's involved in the licensee's review of impact on LSFT's have been completed. The remaining PDC (88-07) was under review when the problem with the core spray LSFT was noted. Twenty-one procedures have been identified as possibly being affected by the PDC and are currently under review. The CS functional test appears to be the only affected test run prior to completion of the PDC-procedure review.

The licensee indicated that a possible future improvement will be to use the LSFT/SAA data base to determine the impact of a PDC on procedures before implementing the modification.

3.4.2.5 Measuring and Test Equipment

The Team reviewed records, interviewed personnel, and toured storage areas to determine the adequacy of the licensee's program for control of measuring and test equipment (M&TE). Administrative control of the program is established by Procedure No. 1.3.36, "Measurement and Test Equipment."

The licensee has implemented a computerized system to issue and track M&TE. This system will only allow issuance equipment to authorized personnel, will limit the checkout period to only 24 hours, and will not issue M&TE if the sticker calibration date does not match the calibration date in the computer. The system also issues a M&TE traveler form to the user to identify usage on each plant device tested and each M&TE range used. This data is later entered into the computer to assist in evaluations if and when a piece of M&TE is found to be out of calibration. The Team reviewed two cases where M&TE was out of calibration and noted that the evaluations performed were documented in accordance with procedures and appeared thorough. Thus far, only electrical I&C and electrical M&TE are on the new computerized system; however, similar controls are being manually implemented for mechanical equipment until it is incorporated into the new system.

The licensee currently has two storage areas for M&TE: one for electrical/I&C and one for mechanical equipment. The Team toured each area and noted that the equipment was identified by a unique number and indicated calibration status. The Team found that the equipment was properly stored and that M&TE out-of-calibration, on hold for repairs, or new equipment not yet in the system, were properly identified and segregated. The licensee indicated plans to go to only one storage area and to increase the number of staff issuing and controlling the M&TE.

The Team also reviewed the system for recalling equipment for calibration. The recall tracking is performed in accordance with Procedure No. 1.8.2, "PM Tracking Program." The Team reviewed several equipment calibration stickers during its tour of the storage areas and during observations of ongoing surveillance and maintenance activities. No equipment past its calibration due date was identified.

The Team found the licensee's control of measuring and test equipment to be adequate.

3.4.2.6 Inservice Testing of Pumps and Valves

The Team reviewed the status of the licensee's program for inservice testing of pumps and valves in accordance with the ASME Boiler and Pressure Vessel Code, Section XI.

The licensee submitted Revision 1A to the inservice test (IST) program on October 24, 1985. A meeting was held between BECo and the NRC on January 14, 1988, to discuss the licensee's proposed Revision 2 to the IST program. To minimize impact on the NRC review cycle, the licensee submitted an interim IST program, Revision 1B, on March 14, 1988, to address concerns identified by the NRC during review of Revision 1A. The licensee plans to submit Revision 2 after the Safety Evaluation Report on Revision 1B is issued. Revision 2 is to maintain the upgrades made to the program in Revision 1B and increase the program scope by adding more components (e.g., relief valves).

Control of the IST Program is established by Procedure No. 8.I.1, "Administration of Inservice Pump and Valve Testing." The Team reviewed the procedure and noted that while it defines the methodology for compliance to the IST program for pumps and valves, including analysis of test data, direction on corrective action, and establishment of reference values (additional guidance is contained in Procedure No. 8.I.3, "Inservice Test Analysis and Documentation Methods"), the organizational responsibilities and referenced IST program revision need to be updated. For example, the pump and valve testing is now scheduled through the MSTP instead of the compliance group, and a Senior ASME Test Engineer has been hired to implement the program. The licensee acknowledged the Team's comments and showed it a draft revision to Procedure 8.I, which is scheduled to be implemented when Revision 2 is submitted. The Team reviewed the draft procedure and noted that it provided additional detail on:

responsibilities, definitions, test requirements, compliance requirements, evaluation, disposition, post-maintenance testing, and administration and records maintenance. The draft procedure also provides a listing of the pumps and valves currently within the testing program and includes a cross-reference for individual test requirements to the approved PNPS procedure.

The Team noted that other improvements (planned or in progress) to the IST program include revising all the implementing procedures to upgrade them to Revision 2 and creating a position for a second ASME test engineer.

The Team reviewed several pump and valve test results for the standby liquid control, core spray, salt service water and low pressure coolant injection systems to verify that the acceptance criteria were met, that the results were properly evaluated and trended, and that the frequency of testing was increased when required. The Team noted that Procedure No. 8.I contains controls to change the MSTP data base test frequency when the deviations fall within the alert range. The Team reviewed changes to various pump reference values to ensure that they were justified and documented. The Team also checked the reactor building closed cooling water, salt service water, and standby liquid control system pumps to ensure that the IST vibration data point was properly marked. No deficiencies were identified during this review.

3.4.3 Conclusions

Based on observations, personnel interviews, and the review of procedures and records noted above, the Team concluded that:

1. The licensee has established and is implementing an adequate and effective program to control all surveillance activities at PNPS.

2. Responsibility for implementing the MSTP has been placed in a centralized, strong, forward-looking division.

3. The licensee was adequately implementing the IST program for pumps and valves. The Team noted that there are several planned improvements to the program involving administrative and implementing procedures and staffing to upgrade the IST program.

4. Licensee management is committed to improve the surveillance program, as evidenced by the upgrades planned or in progress in each area examined. These include: contractor data base reviews; increasing the scope of the IST program, increasing staffing: improved control over issuing and tracking M&TE; establishing an equipment history computer program; replacing the MSTP division lists with task cards; and improving conditional test scheduling.

5. With the exception of the few deficiencies noted above, the procedures were technically adequate.

6. The one concern identified was the licensee's need to resolve the once-per-refueling-outage scheduling deficiency.

3.5 Radiation Protection (RP)

3.5.1 Scope of Review

The Team reviewed various aspects of the radiation protection program during the inspection, with emphasis on the licensee's ability to safely support plant startup. Performance was determined from: observation of work in progress; periodic tours of plant areas; interviews with managers, supervisors, and technicians; and review of selected documents. The areas reviewed are as follows:

1) Organization and staffing;

2) Training, qualification and continuing education of RP technicians;

3) General employee training;

4) ALARA programs;

5) Control and oversight of work in radiological areas;

6) Control of locked high radiation areas;

7) Adequacy of laboratory (count room) equipment;

8) Availability and adequacy of portable RP survey equipment;

9) Adequacy of gaseous and liquid release monitoring systems;

10) Clarity and consistency of RP policies and procedures;

11) Audits.

3.5.2 Observations and Findings

3.5.2.1 Organization and Staffing

The organization of the radiation protection (RP) department has remained stable since the significant changes which were made early in 1988. The staffing level has remained constant and is adequate to support plant operations. The RP section manager described various enhancements planned for the supervisory staff. An outline for qualification as Radiation Protection Manager, per Regulatory Guide 1.8, has been approved. One or two division managers within the RP section will be expected to qualify as Radiation Protection Manager to provide depth in the organization. Incentives have been approved for achieving this qualification. In addition, the three division managers will rotate assignments for cross-training purposes, and all will be encouraged to pursue advanced scholastic degrees. These efforts are expected to begin in the near future.

The Team observed some indications of isolated morale problems at the technician and first-line supervisor level which were attributed to several causes. Contributors include personnel and assignment changes within the organization resulting from rotation of radiation protection shift supervisors, an influx of new technicians, impending implementation of a new rotating work schedule, and a perceived lack of management presence in the field. In addition, weaknesses may exist in communications within the RP organization as evidenced by technician perceptions of a lack of technician input or review during the development or revision of RP policies and procedures. In summary, and in spite of these difficulties, the Team observed that the technicians and supervisors were generally enthusiastic and competent.

Another potential weakness results from the practice of rotating technicians through job assignments each three to six months. Although this practice may have merit for familiarization and job exposure purposes it may prevent or significantly delay the development of a high proficiency level in certain specialized technical areas, a concern particularly evident in the instrument repair and calibration facility. Here the RP technician is assigned to repair and calibrate a wide range of instrumentation, including gas flow detector cells, sophisticated computer-controlled automatic friskers, air pumps, and all alpha, beta, gamma and neutron survey meters. The area supervisor stated that he was attempting to resolve this problem by requesting an extension of the rotation cycle.

The RP section has 42 technicians, of whom 36 are ANSI 18.1 qualified. Only 21 have commercial experience. The section manager provided a shift staffing schedule for power ascension testing that will ensure that the experience will be adequately distributed among the individual shift crews.

3.5.2.2 RP Technician Training

The RP technician training and qualification program is certified by the Institute of Nuclear Plant Operations (INPO), uses INPO guidelines for development of instructional material, and uses the INPO exam question bank. The training is conducted in three phases over a period of two years or less, depending on experience. Upon completion of Phase 2, the technician is considered to be ANSI qualified and can issue radiation work permits. The third phase includes specialty tasks such as operation of the whole body counter and respirator fit testing.

Classroom training is provided at the offsite facility. The training facilities were adequate, well lighted, comfortable and equipped with practice equipment. The Team observed that most of the basic survey instruments were available, but laboratory-type gamma spectroscopy equipment, as well as ALARA mock-ups, were not available. This is typical of a single unit station. Most presentations appeared to rely on lectures with minimal use of audio-visual equipment. A review of selected lesson plans showed adequate technical content.

Classroom training is followed by an in-plant phase where the technician receives on-the-job training and demonstrates proficiency at various tasks. This is documented in a qualification folder. Qualified technicians will be provided with ongoing training on a six-week schedule. This will be contingent on implementation of a new six-section rotating work schedule. The training department has begun drafting lesson plans which will cover a broad range of topics, including interpersonal skills training. The instructors must also complete formal qualifications. They were recently required to begin spending a certain number of hours in-plant between training cycles. This keeps them abreast of changes occurring in the plant.

The Team concluded that this program is well-controlled and documented and is aided by a dynamic first-line supervisor. The implementation and effectiveness of cycle training will be evaluated in the future. The licensee's current efforts are directed at completing initial qualification for the entire staff.

3.5.2.3 General Employee Training (GET)

All general employee training and in-processing is conducted at the on-site training center over a three-day period. Classrooms were spacious, comfortable, and well equipped. Ample training aids, as well as audio-visual equipment, were in evidence. A comprehensive student manual is given to each trainee along with copies of appropriate regulations and regulatory guides. Basic training involves 20 contact hours, while radiation workers receive an additional 3 hours. Respirator fit testing is also provided.

The two instructors associated with GET had completed the formal Staff Development program. Both have extensive experience and are well qualified. Although their teaching techniques could not be observed since no classes were in session during the week of this review, the Team concluded that the training content provided adequate direction to attendees. Both instructors spend time in the plant weekly to assess staff training needs.

The GET training is INPO certified. In addition, the training center offers five courses to all new supervisors. A new industrial safety training program is under development. An instructor has been hired and will begin providing training in occupational safety during the first quarter of 1989.

The Team concluded that management support of GET training was good, that the training was effectively conducted, and that it made a positive contribution to safety.

3.5.2.4 ALARA Programs

ALARA performance at this station had been a persistent weakness over several past SALP report periods.

The Team noted recent apparent improvement in upper management support for ALARA programs. Examples of this support are reflected in the re-evaluation of the 1988 ALARA goal from 600 to 390 manrem and formulation of several plans to reduce exposures. Also, the licensee is assigning an experienced manager to survey INPO, Electric Power Research Institute (EPRI), and several other nuclear stations to make a list of cost-effective exposure source term reduction techniques. The Station Director will then formulate a long-term program based on the findings of this survey. Another plan is to begin removal of abandoned in-place systems in 1989 which should remove unnecessary sources of exposure. A third project is underway to identify hot spots in plant piping and determine which of these could be reduced by flushing.

The ALARA staff also has plans to attend a training course and visit other stations to observe effective techniques. This staff is in the process of filling its final vacancy.

ALARA performance at the working level remains mixed. Licensing personnel developed a technique for conducting remote inspections of fire barrier penetrations using a flashlight mounted on a telescope. This concept may be applied in numerous situations and has the potential for significant dose savings. On the other hand, instances of failure to effectively use low-dose waiting areas were observed during work. The ALARA division manager is working to increase the sensitivity of all workers and technicians to ALARA practices.

The Team concluded that licensee attention to ALARA programs has significantly improved in recent months. The effectiveness and implementation of ALARA plans will be assessed in future NRC inspections.

3.5.2.5 Control of Work

During closure of a Confirmatory Order in the fall of 1987, NRC noted some improvement in the relations between the RP section and the other sections performing work. However, poor planning and lack of work control continued to be observed. During this assessment, further improvement in resolving these weaknesses was observed.

One indicator of poor planning is the number of radiation work permits (RWP) issued but not used. A review found that only a small fraction of RWP's issued are now unused. In addition, the use of "A" priority maintenance work requests by the Operations Department to expedite work has decreased significantly.

The use of a Radiation Protection Advisor assigned to the Maintenance department continues to be effective. This position was recently assumed by an experienced RP technician. He has introduced innovations, including frequent work group training sessions and installation of permanently situated boxes in the plant for contaminated tools.

The Planning Division is developing improved procedures for planning work. This section is responsible for coordinating with the RP and ALARA groups during the early phases of work planning. This allows adequate time for RWP preparation and ALARA reviews. Responsible section managers stated that this early maintenance-HP contact will be proceduralized in September 1988.

The Team observed that on-the-job cooperation between workers and RP technicians was good. A minor problem was noted in that RP technicians in the controlled area appeared unprepared to deal with a minor first-aid injury. Technicians were uncertain in dealing with a worker with abrasions to his nose that caused bleeding. This was attributed by the Team to a lack of training and clear policies. On the other hand, technicians appeared well prepared to handle more serious emergencies.

3.5.2.6 Control of Locked High Radiation Areas

The licensee has previously incurred several violations for failure to properly control locked high radiation areas. This issue has been tracked as a NRC outstanding item (87-57-01). The licensee organized a task force to determine which lasting corrective actions would prevent a recurrence of these problems. Based on the findings of the task force, the control procedures were revised to place basic responsibility on the RP technician who signs out the door key. Further controls are provided by shift tours of all locked areas and by upgrading locking devices. Based on these actions, the Team concluded the licensee had appropriately addressed concerns in this area.

3.5.2.7 Laboratory Equipment

The adequacy and availability of RP laboratory equipment to support plant startup was reviewed. The licensee has available two multichannel analyzers (Nuclear Data 6700), several beta counters (BC4), and several alpha counters (SAC 4). The radiochemistry laboratory has redundant equipment for backup. This equipment is required to perform isotopic analysis of air samples for maximum permitted concentration (MPC) calculations, detection of degraded fuel conditions, and to support radwaste analysis. Procedures for the use of the equipment are available in the laboratory.

The Team noted that, at the time of the inspection, several pieces of laboratory equipment were awaiting repair or calibration. Only one BC-4 and one SAC-4 were operational in the lab. Both multichannel analyzers were awaiting repair parts. The supervisor in charge attributed this to the lack of proficiency of the technicians due to the rotating work assignment policy. This issue was discussed in Section 3.5.2.1.

3.5.2.8 Survey Equipment

The availability of properly calibrated survey equipment was reviewed. Survey equipment is used by RP technicians to measure dose rates, and surface and airborne contamination levels. Included in the review were the automatic personnel contamination detectors.

All equipment is calibrated and repaired in a facility on site, except for neutron survey meters. RP technicians are trained to perform all functions in the facility. The facility appeared to be adequately equipped to perform its task.

Stocks of equipment ready for issuance appeared ample and the calibration/repair backlog was minimal. This readiness may have been aided somewhat by reduced outage activity. The Team noted an improvement in that the new manager of the group has recently implemented a computer program that shows the status of each piece of equipment, the data base for which is updated each time an instrument is issued. Information that is captured includes users of the meter, calibration due date, and failure mode if placed out of service.

The Team concluded that an adequate supply of calibrated instruments is on hand to support routine operations and abnormal conditions.

3.5.2.9 Monitoring Environmental Releases

The operability of the environmental release monitors was verified. The two paths for a gaseous release are the main stack and the reactor building vent. The monitors were found to be operational and properly calibrated, with approved procedures available. The equipment is maintained by the Chemistry Group while the calculations of offsite doses required by the revised Radiological Environmental Technical Specifications (RETS) are performed by the RP section.

The single liquid release path monitor was operational. Due to elevated background radiation levels at the sodium iodide monitor, a new system has been installed parallel to the old system. The new system will offer increased sensitivity and will be brought on line in the near future.

3.5.2.10 Policies and Procedures

A sampling of RP procedures indicates that they are generally clear. The number of procedures controlling the RP department activities is extensive. However, the format varies from step-by-step instructions to a more general format. The RWP procedure is currently being revised to make the process less cumbersome and more useful. In general, the RP technicians did not feel adequately consulted during the revision of procedures. This issue was discussed in Section 3.5.2.1.

The Team concluded that the RP procedures were adequate to support startup.

3.5.2.11 Audits

Previous inspections found the licensee's internal audits and asssessments of the RP program were primarily compliance-oriented. Currently, these audits are completed in several ways. Several peer evaluators were trained to make on-the-job observations. A Radiological Assessor is permanently assigned to the staff reporting to the Senior Vice President. The Management Oversight and Assessment Team (MO&AT) does monthly plant tours. Also, the QA Department recently transferred in two experienced RP personnel. In addition to the above audits and reviews, the Radiological Occurrence Report (ROR) system provides a method to capture input from workers and RP technicians.

A review of these efforts shows that a moderate level of success has been achieved in finding program weaknesses. However, the results have not been commensurate with the effort involved. The RP section manager stated that an effort is underway to shift the emphasis of these audits to performance rather than compliance. The audit performed by QA in November 1987 is being used as a model. Licensee efforts in this regard are expected to be long term and are adequate at this time to support plant startup.

3.5.2.12 Control of Radiological Shielding

The Team reviewed the licensee's program for the installation, control, and removal of radiation shielding. This review concluded that the licensee's program for control of radiation shielding is well documented and that implementation is good.

The program guidelines are contained in PNPS Procedure 6.10-008, "Installation and Removal of Shielding." Responsibility for implementation of the procedural requirements fall under the auspices of the Radiological Technical Support Division. The procedural requirements for controlling this process appear well defined and comprehensive. Licensee personnel responsible for implementation of the procedure were well versed on procedural requirements and current field installations. Licensee records of field installations were current, had been reviewed at the required intervals, and were accurate.

3.5.2.13 Health Physics Training

The Team observed licensee personnel during a contamination control training exercise. The exercise simulated a spill of highly radioactive (3 Rem on contact) resin during transfer operations. The scenario document was well defined and included detailed timelines and instructions to the exercise controllers. The entire exercise was videotaped and replayed during the debriefing of participants. The exercise was well controlled and interviews with participants indicated that the individuals involved considered it to be an effective training device. Lessons learned and feedback from participants appeared to be well disseminated.

3.5.2.14 Hydrogen Water Chemistry System

The licensee has installed a system to inject hydrogen gas into the feedwater to reduce the potential for corrosion of reactor internal piping. This process will result in increased radiation levels onsite from increased radioactive nitrogen isotope levels in the system. A review of the impact analysis showed that a comprehensive plan to control exposures has been developed. A test run in 1985 resulted in the installation of a 16-foot high 20-inch thick concrete shield around the turbine. Moreover, special controls are programmed into the computer that controls the hydrogen injection. The cognizant engineer stated that these controls are designed to prevent increased exposure either onsite or offsite. Team review of these calculations showed that doses may in fact be lowered.

The Training Department is developing a training program for the RP technicians to review the change in radiation levels that occur with operations. This program was developed to refresh the RP technicians because of the extended shutdown and the increased levels of radiation in the shielded areas resulting from the addition of hydrogen. The RP section manager stated that a condensed revision of these presentations will also be given to all maintenance and operations personnel prior to startup.

3.5.3 Conclusions

The Team determined that progress has been made, that adequate staff and management oversight is in-place to achieve further progress, and that performance is adequate to support plant startup.

Licensee strengths include a well-controlled and well-organized training program for general employees and RP technicians. The use of an RP Advisor in the Maintenance Section, which had been effective in improving working relationships, has led to further initiatives in training and control of contaminated tools. The addition of this position has also resulted in improved planning and control of work.

Notable progress was observed regarding upper management support and emphasis on ALARA. This attention is expected to result in improving levels of performance over the next few years. Staff development programs for all levels of personnel, from technicians through managers, should considerably improve their level of performance. Control of technical problems, such as the radiological impact of hydrogen water chemistry and calibration status of survey meters, has improved.

A weakness was observed as a result of the rotational assignment of RP technicians that may affect their proficiency in performing certain highly specialized jobs. An additional weakness concerns the perception of poor vertical communications between management and RP technicians and workers Although this issue has led to some incomplete understanding of policies and some morale problems, it has not significantly affected safety performance.

Additionally, vertical communications within the RP organization appeared somewhat weak. The Team detected a perception on the part of technicians that they have not been adequately involved in the changes being made in the RP Department policies and procedures. This perception apparently has resulted from RP management not effectively communicating the bases for these changes to the staff. There is also a perception that RP management is remote and not easily accessible. However, the Team determined that, despite this weakness, the attitude and safety approach of the RP Department staff has significantly improved and is adequate to support plant operations.

The licensee advised that a training program is being developed to refresh RP technicians concerning the change in radiological conditions on plant startup and the unique conditions to be created by the addition of hydrogen. A condensed version of this training will be provided to other radiation workers. Completion of this effort will be reviewed in a future NRC inspection.

3.6 Security and Safeguards

3.6.1 Scope of Review

Prior to the plant shutdown in April 1986, NRC had identified serious concerns regarding the implementation and management support of the security program at Pilgrim. The licensee has been aggressively pursuing a comprehensive course of action to identify and correct the root causes of the programmatic weaknesses in physical security. The most recent SALP (50-293/87-99) covering the period February 1, 1987 to May 15, 1988, determined that the licensee has demonstrated a commitment to implement an effective security program. The licensee's security organization has been expanded with the addition of experienced personnel in key positions, significant capital resources have been expended to upgrade security hardware, and equipment and program plans have been improved

During the IAT inspection, all phases of the security program, including management support, staffing, organization, and hardware maintenance, have been reviewed to assess the effectiveness of the program implementation. The results of the review are described below in general terms to exclude any safeguards information.

3.6.2 Observations and Findings

3.6.2.1 Review of Security Program Upgrades

The Team reviewed the progress made to date on the security program improvements committed to by the licensee as a result of previous NRC enforcement action. The licensee was advised by the Team that progress on these improvements will continue to be monitored during future NRC inspections. Those commitments and their status are as follows.

Project	Status
Protected Area Perimeter	The upgrades of the perimeter barrier, intrusion detection system, and assessment aid system are complete.

Project	Status
Protected Area and Perimeter Lighting	Installation of upgraded lighting is approximately 95% complete. Four light stanchions remain to be installed. The lighting system as installed meets regulatory requirements.
Main and Alternate Access Control Points	The designs for the new (upgraded) access control points are complete and new package search equipment is on site. Installation of new package and personnel search equipment and full length turnstiles is scheduled for completion on September 28, 1988, in the site's main access point. Installation of new package search equipment in the site's alternate access point is also scheduled for September 28, 1988.
Vital Area Analysis	The vital area analysis, including walkdown of all vital areas to verify barrier integrity, and issuance of the report, is complete.
New Security Computer	The selection of the new computer has been made and a purchase order for the computer has been issued. The licensee is currently working with the vendor on software options. The delivery of the new computer is scheduled for the first quarter of 1989, with installation to follow.

3.6.2.2 Followup on Previously Unresolved Item

(Closed) Unresolved Item (50-293/87-44-01): Neighborhood checks for licensee employees being assigned to the site were not being consistently conducted as part of the access control program. The neighborhood checks were not a regulatory requirement and it is a licensee-identified issue. During this inspection, the Team verified that the licensee has conducted a review and identified all site personnel who had not been subjected to neighborhood checks.. For those employees with less than three years of service with the licensee, neighborhood checks were subsequently conducted. For employees with more than three years with the company, a review of the personnel file was conducted and a memorandum was put into the file to indicate that the review was being made in lieu of the neighborhood check. The acceptability of this alternative to the neighborhood checks was reviewed by NRC prior to its implementation and was found satisfactory.

3.6.2.3 Security Plan and Implementing Procedures

The Team met with licensee representatives and discussed the NRC-approved Security Plan (the Plan). As a result of these discussions, and a review of the Plan and its implementing procedures, the Team found that the implementing procedures adequately addressed the Plan's commitments. In addition, all security personnel interviewed demonstrated familiarity with the Plan, implementing procedures, and NRC's security program performance objectives.

3.6.2.4 Management Effectiveness - Security Programs

An in-depth review of the licensees management effectiveness was conducted by NRC in April and May 1988 and documented in Inspection Report No. 50-293/88-18. During that inspection, the Team concluded that the licensee has continued with its initiatives and taken significant actions to further improve the effectiveness of the security organization. It was also concluded that the existing organization should provide the capability to monitor the program properly.

During its inspection, the Team independently concluded that there is a strong management team in place based on the experience of the expanded proprietary security organization, the effective interaction both between members of the security organization and with other departments, and the effective oversight of the contract security organization.

3.6.2.5 Security Organization

On August 16, 1988, at 10:00 p.m., the security contractor for PNPS was changed from Globe Security Systems to the Wackenhut Corporation. The Team reviewed the licensee's and the contractor's transition plans, and interviewed numerous management and union security personnel prior to the transition. Also, the Team was onsite during the transition for direct observations. The transition was somewhat simplified by the fact that all Globe employees that applied for positions were retained by Wackenhut. The Team determined that, because of comprehensive transition planning, the change in the contract security force was accomplished without any compromise of security and with minimal disruption to security operations.

3.6.2.6 Security Program Audit

The Team reviewed the monthly corporate audit reports. These audit reports were of good quality and were generated as a result of corporate oversight of the site security program. The findings in these reports were minor and not indicative of any major programmatic problems. The corrective actions were appropriate for the findings.

3.6.2.7 Records and Reports

The Team reviewed various security records, logs, and reports, including patrol logs, central alarm station (CAS) logs, visitor control logs, and testing and maintenance records. All records, logs, and reports reviewed were complete and maintained as committed to in the Plan.

3.6.2.8 Testing and Maintenance

The Team reviewed the testing and maintenance records and procedures. The review disclosed that the preventive maintenance procedures were comprehensive and that the licensee now has in-place a program that provides for prioritization of security maintenance by the security department. The maintenance support to the security department has improved as a result of the security department assigning priority to the maintenance work. The use of compensatory measures for inoperative equipment is minimal.

3.6.2.9 Locks, Keys and Combinations

The Team reviewed the installation, storage, rotation and related records for all locks, keys and combinations and determined that the licensee was meeting the commitments in the Plan and its implementing procedures.

3.6.2.10 Physical Barriers - Protected Areas

The Team physically inspected the protected area barriers. It was determined by observations that the barriers were installed and maintained as described in the Plan. Progress on upgrading the barriers is addressed in Section 3.6.2.1 of this section.

3.6.2.11 Physical Barriers - Vital Areas

The Team physically inspected the vital area barriers and determined that the barriers were installed and maintained as described in the Plan.

3.6.2.12 Security System Power Supply

The Team reviewed the security system power supply system and determined that it was in accordance with Plan requirements. The Team noted that as a result of the approval of a recent Plan revision, improvements for protecting the security power supply are underway, with work expected to be completed by September 28, 1988.

3.6.2.13 Lighting

The Team observed lighting within the protected area. All areas were lighted in accordance with commitments in the Plan. Progress on upgrading the lighting is addressed in Section 3.6.2.1.

3.6.2.14 Compensatory Measures

The Team reviewed the licensee's compensatory measures and determined that their use to be consistent with the commitments in the Plan. As a result of the security program upgrades addressed in Section 3.6.2.1, the need for compensatory measures for degraded security equipment has been dramatically reduced. Further reductions in the use of compensatory measures will occur as project upgrades are completed.

3.6.2.15 Assessment Aids

The Team reviewed the licensee's use of assessment aids and determined by observation that the assessment aids are installed, functioning and maintained as committed to in the Plan. Progress on upgrading the assessment aids is addressed in Section 3.6.2.1.

3.6.2.16 Access Control - Personnel and Packages

The Team reviewed the access control procedures for personnel and packages and determined that they are consistent with commitments in the Plan. This determination was made by observing personnel access processing during shift changes, visitor access processing, and by interviewing security personnel about package access procedures. The status of upgrades in the access control points is addressed in Section 3.6.2.1.

3.6.2.17 Access Control - Vehicles

The Team reviewed vehicle access control procedures and observed vehicle searches at the Main Vehicle Gate. It was determined that vehicle searches were being conducted consistent with commitments in the Plan.

3.6.2.18 Detection Aids - Protected Area

The Team observed penetration tests of approximately 25% of the licensee's intrusion detection system on August 17, 1988. The remaining 75% was not tested during this inspection; however, previous test records were reviewed and the records indicated that the system was operating as described in the Plan and implementing procedures.

3.6.2.19 Detection Aids - Vital Area

The Team observed the testing of intrusion detection aids in selected vital areas and determined that they were installed and functioning as committed to in the Plan.

3.6.2.20 Alarm Stations

The Team observed the operation of both the Central Alarm Station (CAS) and the Secondary Alarm Station (SAS) and found them to be in accordance with Plan commitments. During the previous inspection (50-293/88-16), a concern was identified that the licensee was diverting an alarm station monitor from security duty to respond to fire protection system and health physics alarms. During the IAT inspection, the Team noted improvements in that there is a marked decrease in the number of nuisance alarms, as a result of the removal of the fire door and health physics doors from the security alarm system.

3.6.2.21 Communications

The Team observed tests of all communication capabilities in both the CAS and the SAS. The Team also reviewed testing records for the various means of communications available to security force members and found them to be as committed to in the Plan.

3.6.2.22 Training and Qualification - General Requirements

The Team reviewed the licensee's Training and Qualification Plan and implementing procedures and determined that they were being implemented as committed to in the Plan.

3.6.2.23 Safeguards Contingency Plan Implementation Review

The Team reviewed the licensee's Contingency Plan and implementing procedures and determined that all exercises were being performed by the security organization as committed to in the Plan.

3.6.2.24 Protection of Safeguards Information

The Team reviewed the protection and handling procedures for Safeguards Information (SGI) and determined that the licensee had completed an inspection of each office onsite that handled and stored SGI. The inspection results indicated that the SGI assigned to each office was accounted for and was being stored in accordance with established licensee procedures.

3.6.3 Conclusions

A comprehensive review of the licensee's security program determined that the licensee has established and is implementing a significantly improved security program over that which existed when the station was shutdown in April 1986. Upgrades to the security program include a greatly expanded proprietary security organization, major installation of state-of-the-art equipment, improved security maintenance support, and upgrades to plans and procedures.

3.7 Training

3.7.1 Scope of Review

The Team assessed the scope, quality, and effectiveness of the licensee's training programs. Included in this review were the licensed and non-licensed operator training programs and the programs for technical and general training of the plant staff.

3.7.2 Observations and Findings

3.7.2.1 Operations Training

Operations Training Programs are outlined in PNPS Nuclear Training Manual, T-001, Part 3, and have received INPO accreditation. The Operations Training Programs include initial and requalification training for licensed operators, initial and continuing training for non-licensed operators, Shift Technical Advisor (STA) training, and SRO certification training. The Team reviewed these programs and discussed various aspects of the programs with members of the licensee's training and operation's staff. The Team reviewed eight Operator and Senior Reactor Operator training records to verify compliance with Section 3.5.5 of the Training Manual. To evaluate the effectiveness of the training programs, the Team observed classroom and simulator training; interviewed licensed operators and senior operators, non-licensed operators and STAs; reviewed several training evaluation and feedback forms from classroom and simulator training conducted during the current requalification cycle; and observed ongoing operations in the plant.

Overall, the Team determined that the Operations Training Programs are adequate and effective. Classroom and simulator training observed appeared to be effective. Instructor preparation was good and the lesson plan content was complete. During observations of classroom training for PDC 88-07 involving the degraded voltage modification, the Team noted that the depth of knowledge being presented was adequate and student participation was encouraged. After observing the conduct of the annual simulator operating exam, the Team noted improved communications between members of the operating crew. In addition, the Team noted the simulator examination was also being observed by licensee upper management. Discussions with training and operations personnel confirmed that strong upper management attention and support for all aspects of the licensed training programs is evident. Interviews with licensed operators indicated that overall they are very satisfied that training programs are well-suited to their needs, and that the programs are responsive to their feedback. Operators indicated that the training program has greatly improved over the past year with the incorporation of simulator training into the requalification program.

Discussions with Operations Training staff indicated sufficient staffing to conduct training programs. Thirteen instructors are currently receiving Senior Reactor Operator (SRO) certification training and are expected to be fully certified by the end of 1988. The use of experienced PNPS instructors instead of contractors for the operations training programs should enhance the quality of the licensee's programs as well as contribute to the depth of in-house operational expertise.

Recent additions to the licensed requalification program include the incorporation of Emergency Operating Procedure (EOP) proficiency training. This includes at least 4 hours devoted to EOP review in the classroom and/or simulator during each 32-hour segment of the program. (Each operator normally receives one segment of requalification training every five weeks.) Also, the exam structure at the end of each session has been modified to include written and simulator operating exams, which will aid the training staff in determining the effectiveness of the programs on a more frequent basis. In addition, the training staff appears to carefully track attendance in requalification training to assure that everyone required to attend is trained in each module of the requalification program.

The operation's training staff appears to have a very effective working relationship with the operations department. They meet to discuss training needs on a frequent basis. Through these meetings, the training department appears able to sufficiently track and schedule the licensed training either required or requested to be completed prior to restart. In addition, the operation's department often provided support during simulator examinations.

The Team reviewed the licensee's special training program for the sixteen licensed operators (14 RO's and 2 SRO's) who currently hold NRC licenses which are limited pending on-watch training during the Power Ascension Program. The Team discussed various aspects of the program with members of the licensee's training and operations staff. The Team noted that the licensee has established a structured and supervised program to assure completion of NRC requirements to allow removal of the individuals' license limitations. Following a discussion with the Team regarding plans for ensuring that each operator performs a sufficient number of reactivity manipulations, the licensee representative stated that an attachment to the special program would be added to further clarify what constitutes an acceptable manipulation.

The Team observed the operations department staff on four days of consecutive shift rotation. These observations verified the overall effectiveness of training. For example, on-shift communications, an area of emphasis in simulator training, was formal and effective. However, during a walk-through with an equipment operator (non-licensed) of EOP Satellite Procedure 5.3.26, the Team noted several discrepancies in the procedure. It also noted that the EO and an SRO misunderstood a step in the procedure. Upon investigation of these problems, the licensee determined that a decision to train only the EO's and not the licensed operators on the field portion of the satellite procedures contributed to the misunderstanding. These issues are discussed in detail in Section 3.2.4.

Additional Team followup of the problems found during the above-mentioned procedure walk-through identified a weakness in the licensee's method of determining the need for additional training on new procedures and procedure changes. The licensee's current method incorporates review of ORC meeting minutes to determine newly approved procedures or procedure changes requiring training. However, a delay of 30 to 45 days is not unusual between the meeting and the distribution of formal minutes. For example, Procedure 5.3.26 had been revised since equipment operator training was conducted in March and April 1988. The ORC meeting minutes which addressed this procedure change had not been received by the training department as of August 18, 1988, 42 days after the ORC meeting on July 6, 1988.

The Team discussed the issue with a licensee training department representative who stated that the department recognized this concern and was preparing to implement, in October 1988, a more timely method for determining the needed training.

During the inspection, the licensee committed to accelerate implementation of certain features of the improved program, such that the training department will become aware of procedure changes within approximately one day following the ORC meeting. This will allow the training staff the opportunity to review the procedure changes and determine the need for training prior to issuance of the approved procedure. If the training department determines that training is required prior to issuance of the procedure, the department will have the ability to delay the procedure issuance. The licensee representative stated that an internal work instruction detailing this process was being written and would be approved by ORC within about a week. In addition, the training staff will review their backlog of ORC meeting minutes to determine which procedure changes have not been addressed and will take appropriate action. These actions planned by the licensee appeared very responsive to the Team's concerns.

3.7.2.2 Technical and General Training

Nuclear Training Manual, T-001, Parts 4 and 5, outline the licensee's technical and general training programs. Included are training programs in maintenance, health physics, chemistry, fire brigade, emergency plan, supervision, and technical training for staff and managers. The Team reviewed these programs and discussed various aspects of them with members of the licensee's training, technical, and supervisory staff. To evaluate the effectiveness of the training programs, the Team observed classroom instruction; interviewed radiological controls and radiological chemistry (radchem) technicians, QA engineers and first-line supervision; reviewed classroom training evaluation and feedback forms; and observed ongoing work in the plant.

Overall, the licensee's training programs were found to be adequate. Classroom training observed appeared to be effective and student participation was strongly encouraged. In-house staffing for those training programs appeared more than sufficient. The following relatively new training programs are indicative of licensee initiatives to develop employee skills:

-- apprentice programs for maintenance, health physics, and rad chem technicians; and,

-- technical training for newly assigned supervisors.

Additional training programs currently being developed in industrial safety and safety awareness, along with the licensee's CPR program, show the licensee's positive attitude in those areas.

The Team's observations of work in the plant during this inspection verified the overall training effectiveness. However, inadequacies in maintenance post-work testing appeared to be the result of lack of training for the maintenance planning group and first-line supervisors on the post-work testing portion of the new maintenance program (See Section 3.3.2.6).

3.7.3 Conclusions

The licensee's training programs appear to be very good. Team findings in all functional areas indicated overall effectiveness of the training implemented. Examples of areas where training may have needed to be conducted sooner include EOP satellite procedures and the post-work testing program. A weakness was identified in the licensee's method of determining training needed for new procedures and procedure changes.

The licensee appears to have made a strong commitment in the area of licensed operator training, as exemplified by increased staffing, simulator use in requalification training, strong interface between training and operations management, and increased attention and support from upper management. In addition, the creation of new programs fcr supervisors and apprentices reflects an effort by the licensee to effectively promote employee development.

3.8 Fire Protection

3.8.1 Scope of Review

The Team's evaluation of the fire protection program focused on the maintenance of fire protection equipment, the reliance on compensatory measures for degraded equipment, and the performance of personnel on the fire brigade and standing fire watches.

3.8.2 Observations and Findings

Licensee senior management established a station goal of reducing the number of open fire protection corrective maintenance requests (MR's) to 40 from a high of 300. This goal was reached in June 1988. This reduction is indicative of the overall improvement of the material condition of fire protection equipment and systems. The number of MR's began climbing two weeks before the IAT inspection, and reached 63 during the second week of this inspection. The increase was mainly for low-priority MR's.

Fire protection MR's are tracked as a station performance indicator and this increasing trend received prompt senior management attention. The licensee is currently contracting to bring in additional fire protection maintenance support by the end of August 1988. The fire protection manager meets daily with operations, maintenance and planning sections to schedule MR's and develop the station's work plan. The Team concluded that the licensee is giving proper management attention to fire protection MR's.

There are over 5,000 fire barrier penetration seals at PNPS. The licensee's tagging system has been effective in identifying these penetrations, with no untagged penetrations or degraded penetration seals observed by the Team.

The number of fire watch postings has been reduced from 145 a year ago to 45 prior to this inspection. Fifteen of these remaining postings will be eliminated by changes to the fire protection program which are currently being reviewed by NRC. Another twelve will be eliminated when the licensee completes Engineering Services Request (ESR) 88-339, "Alarm delays on non-vital CAS alarms." This ESR will provide a means to electronically monitor fire doors without undue distraction of security personnel from their primary function. The remaining 18 fire watch postings are due to degraded equipment for which repairs are currently being planned.

Because TS's allow one individual to rove and cover more than one fire watch posting, the number of people on shift committed to fire watch activities is substantially lower than 45. Two personnel per shift are assigned to cover these fire watches. In discussions with the Team, the fire watches appeared knowledgeable about their duties. The Team reviewed several fire watch postings in the plant and identified no concerns. All fire watch rounds were completed on schedule.

The Team observed the on-shift fire brigade respond to an unannounced fire drill. The drill scenario was a simulated main transformer fire with a concurrent failure of the deluge system. The brigade leader developed a successful fire fighting strategy. The brigade members responded promptly in full fire fighting gear. Communications between the brigade and the control room appeared to be adequate. The fire brigade's first-line supervisors observed the drill on their own initiative. The fire protection training instructor was also found to be knowledgeable and enthusiastic about the training program.

3.8.3 Conclusions

Effective management by the fire protection manager and support by senior management are shown by the attention given to the material condition of fire protection equipment and reduced reliance on compensatory measures for degraded equipment. Completion of licensing actions and an ESR will further reduce the number of fire watch postings. There is good identification and control of fire barriers. Personnel assigned fire watch and fire brigade duties are knowledgeable about their duties and perform them properly. The fire protection division is well staffed to meet program needs.

3.9 Engineering Support

3.9.1 Scope of Review

NRC found licensee engineering support to be strong in the past two SALP reports. Because of this history of good performance, engineering support was not selected as a specific area of focus for this inspection. Instead, observations relative to engineering support were made by the Team while it inspected the other functional areas.

3.9.2 Observations and Findings

The Team found that engineering support to the facility is generally very effective. In particular, the Systems Engineering Division functions well to meet plant needs. Also, engineering support to maintenance has improved and is enhanced by the improved maintenance work process and the effective performance of the maintenance engineers.

The Team noted that a number of technical issues, including some NRC open items, as well as licensee-identified items, require NED resolution before plant restart. They are being tracked and pursued for resolution by NED.

During tours of the control room, the Team noted the minimal use of certain human engineering features, such as color-codes, meter "banding" (e.g., marking of normal, alert, and fail positions on meter and gauge faces), and system lineup memory aids. Based on discussions with NED personnel, the Team determined that the licensee performed a detailed control room design review (DCRDR) and received comments on it from the NRC Office of Nuclear Reactor Regulation. A supplemental licensee DCRDR report is required four months after the end of the current outage.

Currently, the licensee's DCRDR project has identified about 140 proposed human engineering improvements which are being evaluated and prioritized. A few were incorporated into design changes this outage. The Team noted that some of the remaining improvements were relatively simple, from an engineering perspective, but could significantly enhance control room human factors. The Team asked whether implementation of some of these items could be accelerated relative to the other, more complex items which may require more detailed engineering and a plant outage to install.

The licensee indicated that these simple improvements, categorized by the licensee as "Paint-Label-Tape," are included in the current 1989 budget. The licensee also committed to evaluate control room human factors during the Power Ascension Program and to include an update regarding the schedule and scope of these "Paint-Label-Tape" items in their report to NRC at the completion of the Power Ascension Program. The licensee was very responsive on this issue. The Team noted that (1) licensee personnel have performed well in the simulator under NRC observation, and (2) there has not been any pattern of performance problems traceable to control room human factors. Thus, the Team concluded that the licensee's approach to this issue is acceptable.

The Team reviewed the licensee's program for the control of transient materials. This review included the licensee's methods for identifying, tracking and removing non-permanent equipment such as tools, gas bottles, and scaffolding located in plant areas where safety-related equipment is housed. The licensee currently assigns responsibility in this area to the Systems Engineering Group (SEG). Station Instruction SI-SG.1010, "Systems Group Systems Walkdown and Area Inspection Guidelines," details the licensee's program for controlling transient materials. Materials so identified during weekly walkdowns by system engineers are documented and are either removed or their presence justified in writing. If the material is allowed to remain in the process building, a seismic missile hazard analysis is performed under Station Instruction SI-SG.1015, "Potential Seismic Missile Hazard," and appropriate measures are implemented to ensure that the materials are properly secured. The licensee is compiling a data base which identifies transient materials which must be removed prior to startup. The program appears to be comprehensive and adequate.

During plant tours, the Team questioned the licensee concerning the installation of splash shields and personnel barriers in the areas of safety-related instrumentation. Specifically, the Team questioned the seismic response of the structures and the effect they may have on safety-related structures.

The fire water spray shield was installed during the current outage. This plant design change was processed under current licensee procedures which require a seismic response analysis prior to modification approval. Personnel barriers installed during the mid-1970's recently had seismic analyses performed on their current configurations. These analyses found them satisfactory.

Based on this information and on a review of licensee documentation, the Team had no further questions.

3.9.3 Conclusions

The Team concluded that engineering support continues to be effective and identified no weaknesses. The licensee has committed to evaluate potential near-term improvements in control room human engineering during power ascension testing.

3.10 Safety Assessment/Quality Verification

3.10.1 Scope of Review

The objective of this inspection was to evaluate the effectiveness of the licensee's self-assessment programs. The inspection focused on determining whether these programs contribute to the prevention of problems by monitoring and evaluating plant performance, providing assessments and findings, and communicating and following up on corrective action recommendations. The inspection consisted of a documentation review, personnel interviews, and observations of meetings and work.

3.10.2 Nuclear Safety Review and Audit Committee

The Nuclear Safety Review and Audit Committee (NSRAC) is an independent body responsible for performing senior-management-directed reviews of activities affecting nuclear safety. The NSRAC reports to the Senior Vice President - Nuclear (SVP-N). Membership on the committee is composed of senior licensee management personnel augmented by consultants.

The Team reviewed the NSRAC procedures manual, Technical Specification 6.5.B, meeting minutes, audit reports, and associated NSRAC reports and correspondence. The Team also attended a full NSRAC meeting at the station on August 2, 1988.

A review of the committee meeting minutes for the period between January 1987 and June 1988 verified that Technical Specification requirements have been met with respect to the composition, duties, meeting frequencies, and responsibilities of the committee. The composition and charter of the committee was significantly revised in February 1988.

The selection process for members was designed to assure a broad-based, independent review of facility activities and to minimize the potential for cost and schedule pressures to influence the committee's reviews and findings. The current committee is made up of ten members appointed by the SVP-N. Of the ten members, five are consultants, including the Committee Chairman. Only two members of the committee hold line responsibility for operation of the plant. Only one member, also a consultant, belonged a year ago. To enhance the perspective of the new members, the licensee implemented an annual training program. The Team was provided with a matrix indicating the experience of current committee members relative to Technical Specification requirements and verified the committee collectively possesses a broad based level of experience and competence. The committee charter, as detailed in NSRAC Procedure 101-1, also does not allow the use of alternate members, although these are allowed by the Technical Specifications. After a review of recent membership changes, and discussions with the NSRAC Coordinator, the Team verified that the collective competence of the committee membership has been maintained as changes were made.

NSRAC currently conducts meetings approximately once a month. Since the beginning of 1988, seven meetings have been conducted, six of which were held at the site. This is significantly more than the once-per-six-months minimum required by the Technical Specifications. Three additional meetings are scheduled for 1988. In addition, individual subcommittees may hold additional meetings at the site. NSRAC also intends to meet at the site in September with several key members of station management to review restart preparations and plans to provide its own independent recommendations for restart readiness.

NSRAC uses subcommittees effectively to review specific areas of interest. Currently, six subcommittees are established: (1) safety evaluations; (2) operations/maintenance, (3) training/security/fire protection; (4) radiation control/chemistry/emergency preparedness; (5) quality overview; and, (6) engineering/technical. Each subcommittee is chaired by a NSRAC member, and is composed of additional personnel appointed by the committee. The subcommittees provide reports to the full committee during their scheduled meetings. The subcommittees are especially useful in performing documentation review to allow more time for open discussions at the meetings.

A stronger NSRAC involvement in station activities is evident not only in the recent site meetings and effective use of subcommittees, but also in scheduled site tours and audit participation. The NSRAC has established a schedule for individual committee members to perform station tours and report the results to the full committee. NSRAC has also designated individual members to participate in selected QA audits throughout the year.

The Team reviewed selected audits conducted under the cognizance of NSRAC, which are required by Technical Specifications. The audits reviewed were thorough, timely, and the noted deficiencies have been corrected or are being tracked. The audit reports reviewed included a third party assessment of the adequacy of the QA program, and QA audits of Technical Specifications, administrative controls, operations, chemistry, radiation protection, and inservice testing. In addition, special audits were recently conducted concerning shutdown from outside the control room, the salt service water system, and NSRAC activities.

The current committee has an effective formal tracking system for all "concerns" forwarded to management and committee followup items. The "concerns" reviewed were clearly transmitted to the SVP-N. However, review of recent meeting minutes by NRC revealed that a number of "recommendations" had been forwarded to the SVP-N, but a formal response had not been received. The committee also did not formally track resolution of these recommendations. Further investigation by the NSRAC Coordinator determined that although the items had not been tracked, the specific recommendations had been implemented, or were incorporated into another corrective action process.

During NSRAC Meeting 88-04, conducted on May 24, 1988, the Operations and Maintenance Subcommittee presented a report on the conduct of the Operations Review Committee (ORC). NSRAC raised concerns over whether the ORC was fully meeting the intent of its duties required in the Technical Specifications. The report identified four specific findings of deficiency. They included:

- Inadequate method of reviewing changes to safety-related procedures;

- Lack of ORC-prepared reports resulting from ORC investigation of a Technical Specifications violations;

- Lack of specific review and reports of facility operations by ORC; and,

- Lack of formality in the conduct of ORC meetings.

After the discussion, NSRAC concurred that the ORC performance issues should be formally raised as a concern to the SVP-N. The NSRAC concern (88-04-01) was transmitted to the SVP-N on May 27, 1988. The concern stated that NSRAC's overall assessment was that ORC's conduct and administration needed substantial improvement. Specifically, the concern stated that the established process did not appear to foster adequate depth and discipline for substantive independent reviews. In addition, NSRAC noted that of the 40 meetings conducted in 1988 prior to the review, neither the Station Director nor the Plant Manager had attended, based on its review of the meeting minutes.

The NSRAC concern was responded to on June 22, 1988. In response, the Station Director initiated revisions to the ORC Charter and Procedure 1.3.4, "Procedures," to accurately describe the specific methods by which ORC met the procedure and operations review requirements. In addition, the Station Director attended an ORC meeting on June 22, 1988, and is considering additional initiatives to improve the conduct and administration of ORC activities. NSRAC closed the concern at the August 2, 1988 meeting, but initiated a followup item to continue to monitor ORC performance. In addition, NSRAC members were encouraged to attend ORC meetings as observers. NRC's review of ORC performance identified similar deficiencies and concluded that additional actions to strengthen some ORC functions were warranted (See Section 3.10.3).

Based on meeting attendance and review of recent meeting minutes, the Team noted that the NSRAC reviews have been thorough and focused on improving performance in areas important to safety. During the August 2, 1988 NSRAC meeting, the Team noted that the discussions were frank and open, with the reviews concentrated on recurring and emerging issues. The areas of emphasis have included 50.59 reviews, ORC performance, corrective action programs, procedure adequacy, and management depth.

Due to the limited number of "concerns" issued by NSRAC since revision of the committee in February 1988, the Team could not reach a conclusion on the responsiveness of the station organization to NSRAC. It appears at least in one case pertaining to ORC performance, that the response was not comprehensive. However, all other "concerns" reviewed were responded to adequately.

3.10.3 Operations Review Committee

The function, composition, and responsibilities of the Operations Review Committee (ORC) are described in PNPS Technical Specification 6.5.A. In addition, PNPS Procedure 1.2.1, "Operations Review Committee," describes in greater detail the authority and responsibility of the ORC at the Pilgrim Station. For this inspection, the Team reviewed the minutes of ORC meetings 88-40 through 88-63 (April 1, 1988 through July 5, 1988) and observed the conduct of three regularly scheduled and two special ORC meetings (ORC Meetings 88-80, 81, 82, 83 and 86). In addition, the Team interviewed various ORC members and alternates.

The inspection focused on whether ORC operations satisfied current Technical Specification requirements; whether the ORC was meeting its responsibilities identified in PNPS Procedure 1.2.1, and whether the ORC was responsive to recommendations for improvements identified during NSRAC and QA audits of its operations.

3.10.3.1 Compliance with Technical Specifications and Procedures

By reviewing existing documentation, and through direct observation of ORC meetings, the Team has determined that the Technical Specification requirements for the ORC composition, quorum, meeting frequency, authority, and records are being satisfied. During the period reviewed, the Team noted that the ORC reviewed plant procedure changes, plant design changes (PDCs), Field Revision Notices (FRNs), and Licensee Event Reports (LERs), as well as proposed revisions to the security plan, to the inservice inspection program, to the emergency plan and to fire protection program implementing procedures. The ORC members and alternates are appointed by memorandum from the Station Director and cannot serve on the committee until they have successfully completed the station ORC training course. There is also a required reading review program used by the Training Department as a retraining program for ORC members and alternates. The Team reviewed the training course material and determined that it had an appropriate emphasis on assuring safe operation as well as on regulatory requirements.

The ORC at Pilgrim Station has been meeting regularly every Wednesday and has a scheduled "special" meeting every Friday on an as-needed basis. The ORC met an average of about twice a week, which is well above Technical Specification requirements.

While there was evidence in the minutes of discussions about LERs, PDCs or FRNs, the preponderence of the minutes described changes to procedures. The Team saw no reference of ORC reviews of Failure and Malfunction Reports. The ORC has a system for following issues identified during discussions which requires a formal response to the ORC and a review of the response by the ORC to assure that the response resolved the initial concerns.

The Team reviewed the closeout process for ORC followup items and determined that, in one case, an item (88-58-01) may have been closed prematurely. During a discussion among the Team, the ORC Chairman, the Design Section Manager, and the Construction Division Manager, the ORC Chairman agreed that the item should be reopened for additional review. During ORC Meeting 88-82, the item was reopened.

By observing the ORC, the Team concluded that the committee members and alternates are concerned with assuring the safe operation of the facility. Discussions focused on the impact of items on safety systems, as well as whether the items being discussed met regulatory requirements or constituted unreviewed safety questions. The Station Director also attended one of the regularly scheduled ORC meetings during the inspection period.

- During its review, the Team identified two weaknesses in the operation of the ORC. They are the Technical Specification (TS) review of plant operations (T.S. 6.5.A.6.e) and the TS requirement to investigate violations and prepare a report covering the evaluation and recommendations to prevent a recurrence (T.S. 6.5.A.6.i). TS 6.5.A.6.e states that the ORC is responsible for the review of facility operations to detect potential safety hazards while TS 6.5.A.6.i states that the ORC is responsible for investigating all TS violations and for preparing a report covering the evaluation and recommendations to prevent a recurrence.

  The Team noted that ORC routinely uses the review of LERs and Failure and Malfunction Reports (F&MRs) to satisfy the TS required review of plant operations and TS violations. The Team also noted that the ORC has appointed the Compliance Division as a subcommittee to the ORC and assigned it the responsibility of presenting selected Failure and Malfunction Reports as well as the preparation of all LERs, including any involving TS violations. Copies of all LERs are provided to the ORC as a means of satisfying the TS requirements. Further, PNPS Procedure 1.2.1 permits the ORC Chairman to set the timeliness of subcommittee reports to the full ORC.

While the use of subcommittees to support ORC activities is acceptable, the Team believes that the method used by ORC in fulfilling its responsibilities as defined by TS 6.5.A.6.e and i needs improvement. In particular, the Compliance Division has been issuing all LERs, including those discussing TS violations, prior to any ORC review of the product prepared. A review of 10 LERs disclosed that ORC review of the LER occurs usually a week to two weeks after the LER was formally sent to the NRC. While this may satisfy the timeliness requirements of PNPS Procedure 1.2.1, it does not appear that the corrective actions proposed to prevent recurrence receives the full benefit of a timely multi-disciplinary review, as is intended by the composition and responsibilities of the ORC. The formal release of the LER involving a TS violation by the ORC subcommittee without a formal review by the complete ORC is a weakness in meeting the requirements of TS 6.5.A.6.i.

During a review of F&MRs, which had not yet been reviewed by ORC, the Team noted that F&MR 86-266, which discussed a TS violation, had not yet been reviewed by ORC.

In this case, the violation was against an administrative requirement in TS Section 6.8, and was not reportable as an LER. Therefore, the F&MR did not result in an LER or a special report. The event occurred in September 1986, and no reports have yet been submitted to ORC as required by the TS. The licensee stated that the F&MR was still open pending completion of the remaining corrective action, and that then a report would be issued.

Both of these findings indicate that the ORC is not actively participating in the timely review of plant operations and does not appear to provide meaningful input into the process.

3.10.3.2 Responsiveness to Audit Recommendations

The Team reviewed both quality assurance (QA) audit findings and NSRAC recommendations to determine ORC responsiveness to recommendations for improvements to its operations. In QA Audit Report 87-37, QA listed two recommendations accepted by the ORC. PNPS Procedure 1.2.1 was reviewed and the Team determined that PNPS Procedure 1.2.1, Revision 21, contained the QA recommendations. The ORC was also audited by QA from May 22 through June 22, 1988. The audit generated one recommendation concerning the cross-referencing of ORC meetings with document references. Based upon discussions between the QA auditor and the Team, ORC has also accepted this recommendation.

In May 1988, the ORC received a list of four concerns from NSRAC based upon an audit review of the ORC. While the nature of the specific concerns are discussed in detail in Section 3.10.3 above, they are summarized here. Specifically, the NSRAC expressed concerns about the following areas: (1) the ORC review of changes to safety-related procedures, (2) ORC investigation of TS violations, (3) ORC review of facility operations, and (4) conduct of ORC meetings.

The concerns related to the ORC's investigation of TS violations and its review of plant operations are paralleled by the Team's findings discussed in Section 3.10.3.1 above.

The NSRAC concern with ORC procedure reviews is being evaluated for long-term improvements but no definitive action is currently planned by the licensee. As for NSRAC concern #4, the meetings observed by the Team, were conducted in a manner permitting formal and informal discussions of specific issues. A meeting agenda for regular ORC meetings was prepared and followed. The Team concluded that the meetings were conducted acceptably.

Based on the above, the Team has determined that, in general, the ORC has been receptive to recommendations for improvement. However, the fact that the NSRAC concerns remain unresolved suggests that the ORC may have difficulty addressing more complex recommendations.

The Team also observed that the quality of the meeting minutes could be improved by providing more discussion of the issues by the various ORC members as opposed to providing abstracts of the documents discussed.

Based upon a review of the ORC activities, the Team determined that there are weaknesses in the implementation of responsibilities assigned to the ORC. In particular, the Team determined that weaknesses exist in the review of plant operations and the investigation of TS violations. The Team has concluded that improvements in these two specific areas would result in a more effective ORC. In response to the Team's concerns, the licensee agreed to take certain actions prior to restart to strengthen the operational focus of ORC. These actions are: (1) to review plant incident critiques; (2) to review LER's prior to their submittal to NRC; (3) to review F&MR's on a regular basis; and, (4) to provide for a monthly presentation and discussion of plant operations as a specific agenda item. The Team found these licensee commitments responsive to its concerns.

3.10.4 Quality Assurance Audit and Surveillance Programs

The Team reviewed selected QA audit and surveillance reports, selecting specific findings, discrepancies, and observations for followup of the licensee's corrective action process. QA personnel, including the QA Department (QAD) manager, and other station managers and engineers, were interviewed regarding the audit and surveillance program objectives and overall conclusions which can be drawn from the audit and surveillance findings. The Team also reviewed the quarterly QAD Trend Analysis report, and attended several QA interface meetings. Portions of the Boston Edison Company Quality Assurance Manual (BEQAM) and applicable station procedures were also reviewed.

The technical content and quality of the issues raised in the selected audit reports were excellent. The conduct of a performance-based radiological controls audit by outside consultants was noteworthy. Specifically, the Team reviewed audits required under the cognizance of NSRAC, in accordance with the TS, and found that they are being performed as required. The Team determined that all deficiencies identified in the audits were either closed or adequately tracked by a formal system.

During the conduct of audits and surveillances, deficiency reports (DR) are issued by QA for conditions contrary to management policies and procedures, regulatory requirements, or licensee commitments. A DR which reports a deficiency identified during a QA audit is issued at the time of the audit exit interview. The licensee has an effective system of requiring a written response to the DR within a specified period, dependent on its significance, and for subsequent followup of corrective action. A system also exists for granting extensions through an escalation process to upper management.

QA prepares a monthly status report, including DR status, which is forwarded to senior management for appropriate actions. Review of the most recent QA trend report indicated a decline in the DR backlog, an increase in the number of DR's completed on time, and few extensions needed for DR closeout. The number of deficiencies reported by QA remained fairly constant. These are all indicators that licensee management attention to the corrective action process has had a positive impact.

The licensee also effectively trends Immediate Corrective Actions (ICA), which are identified in audit and surveillance reports. These report conditions which could lead to a DR, but which are corrected prior to the end of the audit or surveillance. They also are tracked along with the DR's. The Team also found the tracking of recommendations from the audits and surveillances to be effective.

Approximately 45 QA surveillance reports concerning observations of surveillance testing were reviewed. The reports were well planned, well documented, and thorough. Again, the tracking and followup of identified deficiencies were adequate. A minor concern of the Team involved QA followup to identified procedural inadequacies during surveillances. In ten of the surveillance activites reviewed by NRC, technical procedure deficiencies were identified by QA, but since the technicians being observed halted the test and pursued a procedure change, no deficiency reports were issued. Further review found that the majority of the procedure deficiencies were identified prior to implementation of new procedure validation program, and that QAD has an open DR on the procedure validation process. QAD is continuing to monitor the process. The Team had no further concerns.

Two QA Interface meetings were attended during the inspection. The meeting attendees include representatives from QA, plant staff, and engineering. They meet weekly to review the status of various corrective action items, including DR's, Management Corrective Action Requests (MCARs) and Potential Conditions Adverse to Quality Reports (PCAQ's). The meetings have improved communications among the organizations and have contributed to the more timely resolution of corrective action items.

3.10.5 Corrective Action Process and Programs

The Team reviewed the licensee's programs currently in place to identify, follow, and correct safety-related problems. A newly formulated Corrective Action Program "Clearinghouse," and proposed revisions to corrective action process procedures were also evaluated with respect to the current objectives and planned initiatives to improve corrective action program effectiveness. Samples were chosen from each of the programmatic areas where problem identification is routine and implementation of corrective measures is required. Each of these programs is discussed below. The Team interviewed licensee personnel responsible for individual program management and implementation, as well as the technical personnel accountable for problem disposition and corrective action adequacy.

For all of the areas evaluated, the Team sought to determine the effectiveness of the licensee's process for root cause analysis of problems, investigation of problems and causes for their generic applicability, and trending of findings to prevent their recurrence. Selected issues were analyzed to understand the technical problems, check how they were programmatically handled, and to determine whether the corrective measures were appropriate to the specific cases. The examples are cited in the following subparagraphs not only to illustrate the scope of licensee activities inspected, but also to support the conclusions reached regarding the corrective action program effectiveness.

3.10.5.1 Failure and Malfunction Reports

The Failure and Malfunction Report (F&MR) is a process by which failures, malfunctions, and abnormal operating events are reported, evaluated and corrected to preclude repetition. The process is described in: Nuclear Organization

Procedure (NOP) 8305, the "Failure and Malfunction Report Process;" PNPS Procedure Number 1.3.24, "Failure and Malfunction Reports;" and PNPS Work Instruction N8-3.2.12, "F&MR Trend Analysis."

Team review of licensee procedures verified that responsibilities are established for the F&MR process; reports are prioritized by safety significance; underlying root causes are evaluated; reports are tracked for completion of corrective action; and, trending for repetitive problems is performed. A report may be initiated by any licensee staff member for failures, malfunctions, and abnormal operating events identified during station operation. The Nuclear Watch Engineer ensures that adequate compensatory measures are implemented and the required notifications are performed. The Compliance Division Manager then recommends a lead group to perform the investigation and performs a reportability review. The appropriate department manager is responsible to ensure that the identified deviations are properly resolved and that corrective actions are planned and effectively implemented in a timely manner. The department manager is also responsible for the review and approval of the reportability, root cause analysis, corrective action plans, disposition, and final closeout. A root cause analysis is performed for those F&MR's determined to be significant. The term "significant" applies to a condition adverse to quality which merits further evaluation for cause and requires management attention to preclude recurrence. The nonsignificant deviations are evaluated in a periodic trend analysis.

The Team identified several discrepancies in the administration of the F&MR process. Procedure 1.3.24 states that the Compliance Division Manager is responsible to present F&MR's that are designated significant or important to ORC. As discussed in Section 3.10.2, the Team noted that the ORC meeting minutes for the previous six months did not record the review of any F&MR's. Further Team review found that a backlog of over existed, and that no F&MRs had been submitted to ORC since February 3, 1988, except for those associated with an LER. Some of the F&MR's involved events which occurred in 1986. The licensee stated this was caused by personnel resource constraints. The Team also found two closed F&MR's which appeared to meet the criteria established in Procedure 1.3.24 for being submitted to ORC, but which had not been submitted prior to closure. F&MR's 88-127 and 88-76 were not reviewed by ORC, but involved recurring conditions, which is a criterion for ORC review. In addition, many of the closed safety-related F&MRs were denoted not safety-related by the Watch Engineer during the initial review process. This mis-classification; however, did not affect the processing and evaluation of the associated events for those F&MR's inspected.

The Team reviewed a listing of open and closed F&MR's and evaluated a sampling of closed reports to determine the completeness and effectiveness of the corrective actions. The total number of F&MR's initiated has been increasing over the last few years. [illegible] licensee has attributed this increase to a hei[illegible]ed sensitivity of personnel to critical self-a[illegible]sment and to the identification of potentially reportable or significant events to management. The total number of open F&MR's has significantly decreased over the last year.

The root cause analyses performed for the F&MR's reviewed were found to be of excellent quality. Each analysis included an event description, probable cause, actions completed, recommended actions, and safety significance. The Systems Engineering Group's impact on this important process has been positive.

The Team reviewed the latest F&MR Trend Analysis Report, which covered the period July through December 1987, and the applicable procedures. The Team noted that the station's Technical Sections did not specifically assign responsibility for the report's proposed recommendations. Further review found that this program deficiency had been previously identified by the licensee and the NRC and that the licensee had initiated corrective action. Specifically, a review of all previous trend report recommendations was performed by the licensee to determine their status.

The review was completed in July 1988, and 74% of the recommendations were corrected. The remaining items are currently being dispositioned by the licensee to ensure effective long-term corrective action. In addition, the licensee has revised the F&MR procedures to include use of the Management Corrective Action Report (MCAR) as a vehicle for the Technical Section to report and correct negative trends identified in the reports. The most recent trend report resulted in the issuance of two MCAR's, which the Team reviewed.

The Team also noted that the trend report focused its discussions primarily on individual problems rather than trend patterns and recurring failures. The Team observed that the Technical Section would be more effective if it thoroughly evaluated trends and patterns, since the individual F&MR itself is adequate to evaluate isolated problems. In addition, the report did not provide any detailed discussion of personnel errors or procedural failures, although there were a large number in the report.

3.10.5.2 Potential Conditions Adverse to Quality

As described by PNPS Nuclear Organization Procedure (NOP) 83A9, "Management Corrective Action Process," the potential conditions adverse to quality (PCAQ) report can be used by any licensee member to document and report any actual or suspected conditions adverse to quality not reported by other report forms such as NCRs, DRs, and F&MRs. In short, it is a process for anyone to elevate a concern to management to assure that the concern will be evaluated and resolved.

As implemented, PCAQs are written from one department to another or from one section to another within a department. For example, Operations (NOD) could send a PCAQ to Engineering (NED) asking for an evaluation of a specific plant condition. In each case, the originating department is responsible for tracking each item to resolution. According to NOP 83A9, a PCAQ is not formally closed until the originating department is satisfied with the proposed corrective action and the corrective action has been implemented.

The Team reviewed a listing of open and closed PCAQ's and also reviewed a sampling of individual PCAQ's to determine the completeness and effectiveness of corrective actions. As of August 19, 1988, there were about 250 PCAQs awaiting resolution. There is currently no central tracking system for all PCAQs, although licensee management has begun initiatives in that area. In June 1988, the licensee began an effort to reduce the number of open PCAQ's and to establish a central tracking system for PCAQ's with the QAD. As part of this effort, each department is reviewing unresolved PCAQ's to evaluate each one's significance and its potential impact on restart. Based on discussions with responsible managers, the Team learned that QAD has completed its review and concluded that none of the unresolved PCAQ's concern equipment operability issues or are of a significance level that requires action before restart. NOD has not completed its evaluation but expects to be finished within two weeks. NED has been implementing a routine review of each unresolved PCAQ and has been maintaining a list of PCAQ's needed to be resolved prior to restart. The review of outstanding PCAQ's is an item on the restart checklist maintained by the plant. Subsequent checklist review by ORC also provides a decision point in the process to assure that all necessary evaluations have been completed.

Based on the above, the Team has concluded that the licensee is assuring that each PCAQ is being evaluated for its nuclear safety and equipment operability impact relative to the planned restart of the plant and that all PCAQ's needed for resolution before restart will be identified. The ORC review of the PCAQ's on the restart checklist will provide another check to assure that resolution of PCAQ's needed for restart has occurred.

The Team selected several closed PCAQ's to determine whether the proposed corrective action had satisfied the originating department's concerns and whether the corrective action was completed as required by station procedures. In general, all identified corrective actions described on the PCAQ's were completed; however, the documentation of the completed activity was, in many cases, limited and specific references were not provided. The Team stated that additional guidance on the level of documentation to be provided on the closeout portion of the PCAQ form could enhance clarity and auditability of the closure process. The Team also noted that the PCAQ system can allow ambiguity of PCAQ status in cases where a proposed action has been rejected by the originating office. For example, NED rejected the response prepared by NOD to PCAQ NED-88-087. A review of the NOD log showed the issue resolved (July 22, 1988), but further investigation with persons affected indicated that the response was being rewritten and further corrective action was to be performed. The formal closeout process and status tracking for the PCAQ's needs improvement. This finding parallels a similar finding of the QA Department contained in QAD 88-609, dated May 23, 1988.

3.10.5.3 Management Corrective Action Request

The BEQAM and NOP 83A9, "Management Corrective Action Process," describe the purpose of the Management Corrective Action Request (MCAR). The MCAR is a two-part corrective action document used to: (1) perform a root cause analysis of significant conditions adverse to quality and develop preventive action plans; and (2) request management to implement selected action plans to prevent recurrence of a problem. In lieu of a Deficiency Report, an MCAR may be used to report and resolve deficiencies involving process or policy issues which affect more than one department and for which management attention and direction is required. An MCAR may also be used for tracking long-term corrective actions related to nonconformance reports (NCRs) and PCAQ's or for identification of adverse trends identified through trend analysis programs.

QAD is assigned administrative control for the MCAR process. QAD logs the status, distributes copies, reports on delinquent MCAR's, and performs the closeout. QAD also reviews each MCAR where the responsible department is different from the issuing department to verify that the assignment of the responsible department is appropriate.

The Team reviewed the current status of open MCAR's and the administrative controls in place to track and promptly resolve MCAR's. The latest monthly status report, issued to the SVP-N on August 1, 1988, from the QAD Manager listed 30 open MCAR's. This list included two 1985 MCAR's and eight 1986 MCAR's. Approximately 40% of the MCAR's initiated since 1984 remain open.

The licensee has previously observed that increased management attention is required to close out MCAR's in a timely manner. For example, the most recent QAD trend analysis report, issued on May 23, 1988, recommended that the SVP-N initiate action to closeout MCAR's QAD 85-2 and QAD 87-2, which address the large number of quality problem reports issued for "failure to follow procedures" and "inadequate procedures."

Team attendance at several QA Interface meetings also noted that there is clearly increased management attention being directed to closeout the longstanding MCAR's.

The Team reviewed two open MCAR's to evaluate the effectiveness of the process. MCAR 86-06, issued in November 198 involved recurring failures of the salt service water (SSW) pumps. The MCAR was issued as a result of an F&MR trend report finding. The MCAR resulted in a detailed root cause analysis by a consultant and the development of a long-term corrective action plan, which is not yet complete. MCAR 88-02, issued in June 1988, concerned programmatic inefficiencies in the PCAQ process. The licensee is actively working on developing an integrated list of the approximately 250 open PCAQ's with a current status (see Section 3.10.4.2). This list is to be utilized to increase emphasis on closeouts. Review of these MCAR's did not identify any discrepancies in the process.

3.10.5.4 Clearinghouse Process

The current procedure describing the corrective action process is NOP 83A9, "Management Corrective Action Process." This procedure discusses the responsibilities of the station departments in resolving identified deficiencies and reporting the trends observed. The procedure also describes the various types of reports or documents available to station personnel and specifically defines their use.

As a result of the self-assessment evaluations and performance improvement plans, the licensee determined that the existing corrective action processes were very complicated and that a streamlined process was needed that would provide an easy means of raising any concerns to management for resolution. A need was also identified for a specific entity which could monitor the performance of the station organization in implementing self-improvement recommendations, as well as provide the focal point for identified issues to be placed into the appropriate plant corrective action process.

In June 1988, the "Clearinghouse" was established to serve a number of needs. It was developed to assure that the licensee's restart assessment team observations had been entered into the regular corrective action process and, when necessary, that all necessary paperwork was prepared for the resolution of any outstanding items. As of this inspection, 69 assessment items remain unresolved but have schedules identified for their completion. Responses for approximately 69 additional items have not been received from the station organization. The balance of the original 449 items have been listed as closed. The Team did not evaluate the closeout process for any completed or closed items.

A second responsibility of the Clearinghouse was to streamline the corrective action process. As of this inspection period, revisions to the station procedures for improvements in corrective action processes have not been made. The current estimate for completion of the necessary procedure revisions was the end of August.

While subject to revision during the required station procedure review process, the following is a discussion of the current licensee philosophy concerning potential modification of the corrective action processes. The Team did not evaluate the effectiveness of these proposed changes in the overall corrective action programs.

The Clearinghouse is currently revising three existing NOPs, creating a new NOP, and revising the BEQAM. The new NOP would define the role and responsibilities of the Clearinghouse, establish a new form for identifying real or potential plant problems, as well as for reporting employee-identified concerns or self-assessment recommendations for plant improvements. The new form would provide a simple method for raising issues, concerns, or recommendations to station management. Upon receipt of this form, the Clearinghouse would review the issue described and integrate the issue into the regular plant corrective action processes for resolution.

Another proposed change is a categorization of all the existing corrective action processes identified in NOP B3A9 into three groups. One group, identified as corrective action processes, would include deficiency reports (DR), non-conformance reports (NCR), management corrective action requests (MCAR), failure and malfunction reports (F&MR), radiological occurrence reports (ROR), security deficiency reports (SDR), and supplier finder reports (SFR). These processes are used to identify and document plant deficiencies and to provide a means of tracking the resolution of identified problems.

A second group of controls would be categorized as normal work control processes. This group would potentially include maintenance requests (MR), housekeeping services assistance (HSA), procedure change notices (PC), and engineering services requests (ESR).

The last group currently being proposed includes all recommendations or findings from the existing self-assessment programs. The information to be tracked in this group are recommendations for improving performance and would not be used to identify programmatic deficiencies. Any identification of deficiencies would be tracked using one of the processes described in the first group above. Examples of the types of recommendations to be tracked would be quality assurance audit findings and peer evaluator reports.

Changes would also be required for NOP 84E1, "Engineering Service Request (ESR) Process," and NOP 84A7, "Drawing Control," as well as the quality assurance manual, in order to fully implement the revised program.

The licensee anticipates that all necessary changes to station procedures would be completed by the end of August, with formal implementation of the program changes within an additional 30 days.

3.10.5.5 Management Oversight and Assessment Team (MO&AT)

In addition to the plant operations oversight provided by the ORC, the MO&AT also provides an oversight review of plant operations by the nature of its responsibilities for overview of restart activities. The MO&AT is composed of eight senior managers, which includes the Station Director, Director of Special Projects and Vice President Nuclear Engineering. The SVP-N acts as the Chairman of the team. Further, three MO&AT members had been licensee managers prior to the arrival of the SVP-N, while the remaining managers joined the licensee subsequent to February 1987.

The MO&AT maintains its oversight of restart-related activities and associated plant operations through several self-assessment programs. These programs include but are not limited to the peer evaluator and management monitoring programs. The Team noted that these programs were effective in evaluating plant activities.

The Team determined that, in some ways, the responsibilities of the MO&AT parallels some of the responsibilities to review plant operations assigned to the ORC. In addition, the Team determined that the current role of the MO&AT is not credited by the ORC as a means of fulfilling its responsibilities to review plant operations, but it does provide a second, independent look at plant operations.

3.10.5.6 Engineering Service Requests (ESR's)

ESRs are tracking forms used by any licensee department to request engineering assistance from the Nuclear Engineering Department (NED). Standard practice within NED is to attach an ESR to all requests for assistance which may be already tracked under another corrective action tracking system, such as DR's, PCAQ's, etc. This is done to provide a means for the NED to track and monitor the progress of its work. When an ESR is opened or received, NED is to review the concern, determine a plan for resolution of the item, which would include an evaluation relative to plans for plant restart. Unless the issue can be resolved within 30 days, a response to the originating department is to be provided within 30 days which describes the above. In discussions with the Team, a management representative of NED indicated that this practice has not always worked as planned and that additional emphasis is being placed on assuring that the 30-day responses are being sent in a timely fashion.

NED tracks all existing ESR's, determines what actions are required prior to restart, and routinely evaluates the potential impacts of outstanding ESR's on the planned restart of the plant. In each case where NED determines that resolution of an ESR is not required to support restart, NED prepares documentation to support that position. This documentation undergoes several levels of review, including the Section Manager, Department Manager and the Vice President - Nuclear Engineering. Any open ESR associated with unresolved PCAQ's or MCAR's is also reviewed by the ORC as part of its assigned restart checklist review.

Based upon discussions with NED personnel, the Team concluded that ESR's are adequately tracked and that upper management is routinely informed of potential problems in a timely fashion.

3.10.5.7 Human Performance Evaluation System

The Team inquired as to the licensee's intentions in participating in the Institute for Nuclear Power Operations (INPO) Human Performance Evaluation System (HPES) program. The program is intended to assist licensees in the reduction of human error by encouraging personnel to report actual or potential situations which keep a person from outstanding performance. The licensee has designated an HPES coordi[illegible]or, who is in the Training Department. The coordinator has been trained by INPO and is currently preparing to implement the program. The coordinator has already become involved in the Incident Investigation and Critique process, and has reviewed the recent findings from the licensee's ESF Actuation Task Force report. This program, once fully implemented, should provide additional valuable input into the corrective action process.

3.10.6 Conclusions

Overall, the Team determined the licensee's programs for safety assessment/quality verification to be adequate and improving. Based upon the areas inspected and examples raised, the Team concluded that:

1. The Nuclear Safety Review and Audit Committee is actively involved in the oversight of facility operations. The committee is composed of experienced managers with diverse experience and provides clear and valid input to the SVP-N on safety-related activities.

2. Plant problems and deficiencies are being identified and entered into the appropriate corrective action system.

3. There are effective, meaningful communications between the QA and plant operations departments, as well as good systems engineering involvement in evaluation and resolution of problems.

4. The weekly QA interface meeting has enhanced communications at the station and improved the process of resolving open issues.

5. The Operations Review Committee (ORC) has not been reviewing plant operations effectively so that meaningful input to licensee management is being consistently provided. Recently, heavy emphasis has been placed on administrative reviews of procedure changes and modifications, rather than reviewing plant operations. Also, ORC review of plant failure and malfunction reports has neither been timely nor included all appropriate reports.

6. Multiple corrective action processes and multiple tracking systems detract from efficient functioning of the system. This has been identified by the licensee and programs are being established to correct the known deficiencies.

7. The tracking and closeout of PCAQ's and MCAR's have not been effective in the past. Also, a relatively large number of open PCAQ's exists. The licensee is taking action to resolve these problem.

4.0 UNRESOLVED ITEMS

An unresolved item is an item for which additional information is required in order to determine whether the item is acceptable, a violation, or a deviation. An unresolved item is discussed in section 3.4.2.2 of this report.

5.0 MANAGEMENT MEETINGS

At periodic intervals during the inspection period, the Team Leader held meetings with senior facility management to discuss the inspection scope and preliminary findings. A final exit interview was conducted on August 24, 1988. Attendees are listed in Appendix B. At the exit meeting, the Team Leader described the preliminary inspection findings, including both the preliminary overall conclusions and the preliminary findings and observations in each functional area. The Team Leader also confirmed licensee commitments at the exit meeting. Then the Team Manager discussed how the Team findings will be used in NRC Restart Assessment Panel activities. Also, the Regional Administrator outlined the remaining step in the NRC staff process of evaluating Pilgrim restart readiness and developing staff recommendation.

APPENDIX A

Entrance Interview Attendees

August 8, 1988

Boston Edison Company

J. Alexander, Plant Operations Section Manager
R. Anderson, Plant Manager
H. Balfour, Training Section Manager
R. Bird, Senior Vice President - Nuclear
F. Famulari, Quality Assurance Department Manager
D. Gillispie, Nuclear Training Department Manager
R. Grazio, Regulatory Section Manager
P. Hamilton, Compliance Division Manager
K. Highfill, Station Director
J. Jens, Radiological Section Manager
E. Kraft, Plant Support Department Manager
R. Ledgett, Director Special Projects
D. Long, Security Section Manager
A. Morisi, Planning and Outage Department Manager
E. Robinson, Corporate Communication Information Division Head
L. Schmeling, Program Manager
J. Seery, Technical Section Manager
R. Sherry, Plant Maintenance Section Manager
R. Swanson, Nuclear Engineering Department Manager
E. Wagner, Assistant to Senior Vice President - Nuclear
F. Wozniak, Fire Protection Division Manager

United States Nuclear Regulatory Commission

F. Akstulewicz, Senior Technical Assistant, Policy Development and Technical Support Branch, Office of Nuclear Reactor Regulation (NRR)
R. Blough, Chief, Reactor Projects Section No. 3B, Division of Reactor Projects (DRP), Region I (RI)
S. Collins, Deputy Director, DRP, RI
L. Doerflein, Project Engineer, DRP, RI
T. Dragoun, Senior Radiation Specialist, Division of Radiation Safety and Safeguards (DRSS)
M. Evans, Operations Engineer, Division of Reactor Safety (DRS), RI
J. Lyash, Resident Inspector, Pilgrim Nuclear Power Station, DRP, RI
D. McDonald, Project Manager, Project Directorate I-3, NRR
L. Plisco, Senior Operations Engineer, Division of License Performance and Quality Evaluation, NRR
W. Raymond, Senior Resident Inspector, Millstone Point, DRP, RI
L. Rossbach, Senior Resident Inspector, Indian Point Unit 2, DRP, RI
G. Smith, Safeguards Specialist, DRSS, RI
C. Warren, Senior Resident Inspector, Pilgrim Nuclear Power Station, DRP, RI

Commonwealth of Massachusetts

P. Agnes, Assistant Secretary of Department of Public Safety
P. Chan, Observer
S. Sholly (MHB Technical Associates, Inc.), Observer

APPENDIX B

Exit Interview Attendees

August 24, 1988

Boston Edison Company

J. Alexander, Plant Operations Section Manager
R. Bird, Senior Vice President - Nuclear
F. Famulari, Quality Assurance Department Manager
D. Gillispie, Nuclear Training Department Manager
R. Grammont, Deputy Maintenance Section Manager
R. Grazio, Regulatory Section Manager
P. Hamilton, Compliance Division Manager
K. Highfill, Station Director
J. Jens, Radiological Section Manager
E. Kraft, Plant Support Department Manager
R. Ledgett, Director Special Projects
D. Long, Security Section Manager
E. Robinson, Corporate Communication Information Division Head
L. Schmeling, Program Manager
J. Seery, Technical Section Manager
R. Sherry, Plant Maintenance Section Manager
R. Swanson, Nuclear Engineering Department Manager
S. Sweeney, Chief Executive Officer and Chairman of the Board
E. Wagner, Assistant to Senior Vice President - Nuclear
F. Wozniak, Fire Protection Division Manager

United States Nuclear Regulatory Commission

F. Akstulewicz, Senior Technical Assistant, Policy Development and Technical Support Branch, Office of Nuclear Reactor Regulation (NRR)
R. Blough, Chief, Reactor Projects Section No. 3B, Division of Reactor Projects (DRP), Region I (RI)
B. Boger, Assistant Director for Region I Reactors, NRR
S. Collins, Deputy Director, DRP, RI
L. Doerflein, Project Engineer, DRP, RI
W. Little, Office of Special Projects, RII
J. Lyash, Resident Inspector, Pilgrim Nuclear Power Station, DRP, RI
D. McDonald, Project Manager, Project Directorate (PD) I-3, NRR
W. Raymond, Senior Resident Inspector, Millstone Point, DRP, RI
L. Rossbach, Senior Resident Inspector, Indian Point Unit 2, DRP, RI
W. Russell, Regional Administrator, RI
C. Warren, Senior Resident Inspector, Pilgrim Nuclear Power Station, DRP, RI
R. Wessman, Director, PD I-3, NRR

Commonwealth of Massachusetts

P. Agnes, Assistant Secretary of Department of Public Safety
P. Chan, Observer
G. Minor (MHB Technical Associates, Inc.), Observer

APPENDIX C

Persons Contacted

R. Anderson, Plant Manager
R. Bird, Senior Vice President - Nuclear
F. Famulari, Quality Assurance Department Manager
K. Highfill, Station Director
E. Howard, Vice President - Nuclear Engineering
E. Kraft, Plant Support Services Manager
A. Morisi, Planning and Outage Manager
R. Swanson, Nuclear Engineering Department Manager
S. Sweeney, Chairman of the Board and Chief Executive Officer

In addition, the Team interviewed a large number of managers (including virtually all section and division managers), engineers, supervisors, and craft personnel in each inspection area.

APPENDIX D

Documents Reviewed

- PNPS, Nuclear Training Manual, T-001, Parts 3, 4 and 5
- PNPS, Special Post-Startup Training Program, Approved August 9, 1988
- PNPS Technical Specifications
- Boston Edison Company Nuclear Mission, Organization and Policy Manual
- Nuclear Organization Procedures
- Material Condition Improvement Action Plan
- Boston Edison Quality Assurance Manual
- Audit Reports -- Sampling review including the following: 87-40, 88-02, 87-63, 88-10, 88-20, 87-37, 87-49, 88-04, and 88-17
- Potential Conditions Adverse to Quality (PCAQ) Reports -- Sampling review including NOD 87-88, NED 86-71, BED 87-255, SO 88-57, SO 88-58, SO 88-48, NOD 87-02, NOD 87-28, NED 88-087, SO 88-59, SO 88-12, NOD 88-120, NED 88-90, SO 88-55, and SO 88-22
- Management Corrective Action Requests (MCAR's) -- Sampling review including QAD 85-2, QAD 87-2, 86-06, and 88-02
- Licensee Event Reports (LER's) -- Sampling review including 87-21, 88-008 thru 88-014, 88-016, and 88-017
- Maintenance Requests (MR's) -- Sampling review cluding 88-11-6, 88-110, 88-10-179, 88-46-300, 88-14-16, 88-45-183, 88-45-181, 88-46-194, 88-10-26, 88-10-105, 88-10-69, 88-10-71, 88-10-80, 88-10-141, 87-10-282, and 87-10-283
- Maintenance Activities/Packages -- Sampling review including 88-3-26, 88-19-109, 88-46-213, 88-10-86, 87-46-173, 88-13-20, 88-46-438, 88-2-12, 86-20-47, 88-45-152, 88-45-176, 88-3-62, 88-63-276, 88-45-190, 88-1-31, 88-14-16, 88-46-194, and 88-10-114
- Meeting Minutes for ORC Meetings 88-40 through 88-63
- Failure and Malfunction Report 86-266
- NED Procedure 16.03, "Corrective Action Program"

- QAD Trend Analysis Report for the First Quarter of 1988 - QAD 88-609
- PNPS Work Instruction NB-3.2.12, F&MR Trend Analysis
- Memo from J. Seery to R. Grazio, Appointment of Compliance Division as ORC Subcommittee, June 23, 1988
- Memo from R. G. Bird to K. L. Highfill, NSRAC Concern from May 24, 1988 NSRAC Meeting - May 27, 1988
- Memo from K. L. Highfill to R. G. Bird, Response to NSRAC Action Item 88-04-01 - June 22, 1988
- Memo from J. A. Seery to R. Flannery, ORC Meeting Minutes Distribution List - dated May 6, 1988
- Procedure 1.2.1, Operation Review Committee
- Procedure 1.3.24, Failure and Malfunction Reports
- Procedure 1.3.2.6, Response to Deficiency Reports
- Procedure 1.3.4, Procedures
- Procedure 1.3.33, Operating Experience Review
- Procedure 1.3.37, Post Trip Reviews
- Procedure 1.3.38, Plant Performance Monitoring Program
- Procedure 1.3.63, Conduct of Critiques and Incident Investigations
- Procedure NOP 83A9, Management Corrective Action Process
- Procedure NOP 83A13, Deficiency Report Process
- Procedure NOP 83A14, Nonconformance Report Process
- Procedure NOP 84A1, Surveillance Monitoring Program
- Procedure NOP 84A11, Annual Independent Review of BECo's Quality Assurance Program
- Procedure NOP 85A1, Nuclear Organization Performance Monitoring and Management Information Program
- Procedure NOP 88A1, Performance Standards and Evaluation Guidelines for Pilgrim Station

- Procedure NOP 8305, The Failure and Malfunction Report Process
- Procedure NOP 8401, Operating Experience Review Program
- Procedure 1.4.5, PNPS Tagging
- Procedure 1.5.3, Maintenance Requests
- Procedure 1.5.3.1, Maintenance Work Plan
- Procedure 1.5.7, Emergency Maintenance
- Procedure 3.M.1-30, Post-Work Testing Guidance
- Procedure SI-MT.1000, Maintenance Section Manual
- Procedure SI-MT.0501, Post-Work Test Matrices and Guidelines
- Procedure 3.M.1-11.1, EQ Maintenance Process: Repair/Replacement
- Procedure 3.M.3-1, A5/A6 Buses 4KV Protective Relay Calibration/Functional Test and Annunciator Verification
- Procedure 3.M.3-8, Inspection/Troubleshooting Electrical Circuits
- Procedure TP 88-40, 480 VAC Contactor Testing
- Procedure TP 88-22, Pre-Operational Test of the New Degraded Voltage Relays and Modified Load Shedding Logic
- Procedure PW TMI-1, Post Work Test Matrix and Guidelines, Revision A
- Procedure 3.M.4-14, Rotating Equipment Inspection, Assembly and Disassembly, Revision 6, dated April 4, 1988
- Procedure 8.Q.3.4, 125/250V DC Motor Control Center Testing and Maintenance
- Procedure 2.2.85, Fuel Pool Cooling System
- Procedure 3.M.1-15, Vibration Monitoring for Preventive Maintenance and Balancing, Revision 5, dated June 12, 1988
- Procedure 2.2.8, Standby AC Power System (Diesel Generators), Revision 20, dated January 13, 1988
- Procedure ARP, Panel C39, Fuel Pool Cooling System, Revision 0, dated January 30, 1988
- Procedure 2.2.83, Reactor Cleanup System, Revision 22, dated June 20, 1988

- Fire Watch Computer Listing, dated August 4, 1988
- Fire Protection Maintenance Request Computer Listing, dated August 9, 1988
- Pilgrim Station Performance Indicators, dated August 10, 1988 and August 17, 1988
- Procedure 8.B.29, "Inspection of Fire Barriers," Revision 1
- Temporary Modification Log
- Temporary Modification Status Report to R. Anderson from P. Mastrangelo, dated August 4, 1988
- Procedure 1.5.9, "Temporary Modifications," Revision 12
- Procedure 1.5.9.1, "Lifted Leads and Jumpers," Revision 0
- Procedure 1.3.34, "Conduct of Operations"
- Procedure 2.1.16, "Nuclear Power Plant Operator Tour," Revision 54
- Overtime Book
- Procedure 1.3.67, "Use and Control of Overtime at PNPS"
- Advance Overtime Requests for Week Ending August 6, 1988
- PNPS 1-ERHS-VIII.B-4-0, Turbine Building Shield Wall Design
- Confidential Memo #13, to J. P. Jens from K. L. Highfill, dated July 19, 1988, "Training Program for Radiation Protection Manager"
- Procedure 6.1-209, "Radiological Occurrence Reports"
- Radiological Work Plan for A and B Recirculation Pump Seal Welds
- Procedure 6.1-012, "Access Control to High Radiation Areas"
- Selected RP Technician Training and Qualification Folders, Lesson Plan, Quizzes and Training Guides
- Selected Radiation Work Permits from March 1988 to August 1988
- Maintenance Request 87-20-84

- Procedure 8.M.2-1.5.3.4, "Primary Containment Isolation Logic Channel Test - Channel B2," Revision 8, dated September 24, 1987
- Procedure 8.M.2-1.5.7, "Group I Primary Containment Isolation Valve Testing," Revision 5, dated November 7, 1987
- Procedure 8.M.2-8.2, "Calibration of ATS Transmitters Rack C2206," Revision 2, dated June 30, 1988
- Procedure 8.M.1-32.4, "Analog Trip System - Trip Unit Calibration - Cabinet C2229-B2," Revision 5, dated April 4, 1988
- Procedure 8.M.2-2.10.8.5, "Diesel Generator 'A' Initiation By Loss of Off-Site Power Logic," Revision 8, dated November 6, 1987
- Procedure 8.M.2-2.10.6.3, "Diesel Generator 'A' Initiation By Core Spray Logic," Revision 12, dated April 9, 1988
- Procedure 3.M.3-1, "A5/A6 Buses 4KV Protective Relay Calibration/Functional Test and Annunciator Verification," Revision 23, dated August 13, 1988
- Procedure 8.M.2-2.6.7, "RCIC Simulated Automatic Actuation," Revision 6, dated February 5, 1988
- Procedure 8.5.5.1, "RCIC Pump Operability and Flow Rate Test at 1000 psig," Revision 24, dated June 4, 1988
- Procedure 8.M.2-2.10.7, "RCIC Automatic Isolation System Logic," Revision 11, dated November 7, 1987
- Procedure 8.M.2-2.6.1, "RCIC Steam Line Hi Flow," Revision 13, dated June 9, 1988
- Procedure 8.M.2-2.6.3, "RCIC Steam Line Hi Temperature," Revision 12, dated July 17, 1987
- Procedure 8.M.2-2.64, "RCIC Steam Line Low Pressure," Revision 16, dated June 20, 1988
- Procedure 8.M.1-32.5, "Analog Trip System - Trip Unit Calibration Cabinet C2233A, Section A," Revision 2, dated December 7, 1987
- Procedure 8.E.11, "Standby Liquid Control System Instrument Calibration," Revision 9, dated September 2, 1987
- Procedure 8.E.13, "RCIC System Instrument Calibration," Revision 14, dated June 26, 1988

- Procedure 8.4.1, "Standby Liquid Control Pump Operability and Flow Rate Test," Revision 19, dated April 9, 1988
- Procedure 1.8, "Master Surveillance Tracking Program," Revision 9, dated August 15, 1988
- Procedure 1.3.36, "Measurement and Test Equipment," Revision 4, dated March 9, 1988
- Procedure 8.I.1, "Administration of Inservice Pump and Valve Testing," Revision 4, dated August 15, 1986
- Procedure 8.I.3, "Inservice Test Analysis and Documentation Methods," Revision 6, dated May 11, 1988

Drawings

- PNPS Elementary Diagram M1N 34-9 (Revision E1): Primary Containment Isolation System
- PNPS Elementary Diagram M1N 28-12 (Revision E14): Primary Containment Isolation System
- PNPS Elementary Diagram M1N 36-7 (Sh. 10, Revision E7): Primary Containment Isolation System
- PNPS Elementary Diagram M1N 36-7 (Sh. 11, Revision E5): Primary Containment Isolation System
- PNPS Elementary Diagram M1N 41-10 (Revision E2): Primary Containment Isolation System
- PNPS Elementary Diagram M1N 38-11 (Revision E2): Primary Containment Isolation System
- PNPS Elementary Diagram M1N 35-7 (Revision E4): Primary Containment Isolation System
- PNPS Elementary Diagram M1G 11-11 (Revision E11): RCIC System
- PNPS Elementary Diagram M1G 12-12 (Revision E5): RCIC System
- PNPS Elementary Diagram M1G 14-9 (Revision E5): RCIC System
- PNPS Elementary Diagram M1G 15-9 (Revision E8): RCIC System
- PNPS Elementary Diagram M1G 16-7 (Revision E5): RCIC System
- PNPS Elementary Diagram M1K 4-11 (Revision E10): Core Spray

- PNPS Schematic Diagram E-548 (Revision E0): Containment Atmosphere Isolation Control
- PNPS Schematic Diagram E-38 (Revision E6): 4160V System Breakers 152-504 and 152-604
- PNPS Schematic Diagram E-35 (Revision E3): 4160V Auxiliary Relays and Miscellaneous Schemes
- PNPS Schematic Diagram E-27 (Revision E7): Diesel Generator
- PNPS Schematic Diagram E-17 (Revision E7): Schematic Meter and Relay Diagram 4160 Volt System
- PNPS Schematic Diagram M6-22-14 (Sh. 1, Revision E11): Diesel Generator "A" X107A Engine Control
- PNPS Relay Setting Drawing E5-200 (Sh. 1, Revision E3): 4160 Volt Switchgear Relay Settings
- PNPS Relay Setting Drawing E5-200 (Sh. 3, Revision E2): 4160 Volt Switchgear Relay Settings
- PNPS P&ID M245 (Revision E13): RCIC System, Sh. 1
- PNPS P&ID M246 (Revision E10): RCIC System, Sh. 2
- PNPS P&ID M249 (Revision E12): Standby Liquid Control System

APPENDIX E

IATI Composition and Structure

Team Manager	Samuel J. Collins
Team Leader	A. Randy Blough
Technical Assistant	Clay C. Warren
Administrative Assistant	Mary Jo DiDonato
Operations	Lawrence W. Rossbach (Lead)
Shift Inspectors	Lawrence W. Rossbach William J. Raymond Loren R. Plisco Lawrence T. Doerflein Francis M. Akstulewicz
Radiological Controls	Thomas F. Dragoun
Maintenance	Jeffrey J. Lyash William J. Raymond
Surveillance	Lawrence T. Doerflein
Security	Gregory C. Smith
Fire Protection	Lawrence W. Rossbach
Assurance of Quality	Loren R. Plisco Francis M. Akstulewicz
Training and Management Effectiveness	Daniel G. McDonald Michele G. Evans
Report Coordinator	Tae K. Kim
Commonwealth of Massachusetts (Observers)	Steven C. Sholly Pamela M. Chan

APPENDIX F

NRC Integrated Assessment Team Inspection (IATI) Members Resumes

This appendix shows IATI summary resumes of the team members and Commonwealth of Massachusetts observers. The resumes outline the nuclear experience of team members.

NAME:	FRANCIS M. AKSTULEWICZ
ORGANIZATION:	United States Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Policy Development and Technical Support Branch
TITLE:	Senior Technical Assistant
EDUCATION:	B.S., Nuclear Engineering
EXPERIENCE:	Fourteen Years of Nuclear Experience as Follows: Two and One-Half Years - Shielding Engineer - Bechtel Power Corporation One Year - Technical Analyst - Office of Material Safety and Safeguards (NRC) Eight Years - Nuclear Engineer - Office of Nuclear Reactor Regulation (NRC) Two Years - Project Manager - Haddam Neck Plant, Office of Nuclear Reactor Regulation (NRC) One-Half Year - Present Position
SPECIAL QUALIFICATIONS:	Completion of NRC Fundamental and Advanced BWR Systems Training Course and BWR Simulator Course
SPECIAL ASSIGNMENTS:	Member of Fire Protection, Health Physics and Diagnostic Team Inspection at Haddam Neck

NAME:	A. RANDOLPH BLOUGH
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Reactor Projects
TITLE:	Chief, Reactor Projects Section No. 3B
EDUCATION:	B.S., U.S. Naval Academy, 1973 (Graduated with Honors) Navy Nuclear Engineer ... ar Course, 1977 NRC Inspector Techn.c ... Training Program, 1980 Various technical and management courses in USN and USNRC, such as QA, Reactor Engineering, Reactor Safety, Supervising Human Resources, EEO, Management Workshops
EXPERIENCE:	Fifteen Years Nuclear Experience as Follows:
1985-Present	United States Nuclear Regulatory Commission (USNRC) -- Reactor Projects Section Chief. Manage safety inspection programs for three commercial reactor facilities. Supervise nine nuclear engineers. Provide formal assessments of utility management effectiveness and safety performance
1982-1985	USNRC -- Senior Resident Inspector at operations phase and preoperational phase nuclear power plants. Planned, supervised, and performed inspections of management controls and activities important to nuclear safety. Coordinated specialist inspector efforts. Formally reported findings and recommended appropriate enforcement.
1972-1982	USNRC -- Resident Inspector. Planned, performed, and documented inspections of all functional areas at a dual-unit operating reactor site.
1973-1979	U. S. Navy Nuclear Power Program. Duties included supervisory positions in nuclear plant operations, maintenance and training. Performed audits and coordinated plant self-assessment. Was responsible for a complex, in-plant nuclear training program for up to 300 students. Shipboard duties included Main Propulsion Assistant: responsible for all reactor and main propulsion systems, all radiological controls and plant chemistry. Collateral duties included QA Officer, and Nuclear Weapons Safety/Security Officer.
SPECIAL QUALIFICATIONS:	Qualified BWR Inspector, NRC Region I, 1980 Qualified Nuclear Engineer Officer, Naval Reactors, 1977
SPECIAL ASSIGNMENTS:	Team Leader, NRC Integrated Performance Assessment Team Inspection, Oyster Creek, 1987 Team Leader, NRC Team Inspection of Oyster Creek Containment Vacuum Breakers Event, 1987 Participated in various other plant readiness inspections, 1984-1985

NAME:	PAMELA M. CHAN
ORGANIZATION:	Massachusetts Energy Facilities Siting Council (Since 12/87)
TITLE:	Engineer/Utility Analyst
EDUCATION:	B.S. M.E. Pennsylvania State University
EXPERIENCE:	Five Years Nuclear Experience as Follows:
1987	United States Nuclear Regulatory Commission, Region III, Reactor Inspector
1985-1987	Nuclear Power Services - Construction
1984-1985	Combustion Engineering - Nuclear Systems Services; Field Service Engineer
1982-1984	Stone & Webster Engineering Corporation - Power Division System Engineer - Turbine Plant Systems
SPECIAL QUALIFICATIONS:	Background in Maintenance and Quality Assurance
SPECIAL ASSIGNMENTS:	Participated in several team inspections while at NRC Region III

NAME: SAMUEL J. COLLINS

ORGANIZATION: United States Nuclear Regulatory Commission, Region I
Division of Reactor Projects

TITLE: Deputy Director

EDUCATION: Bachelor of Science, Maine Maritime Academy
Business Program, Southern Vermont College

EXPERIENCE: Seventeen Years Nuclear Experience in Design, Construction, Operations, Inspection and Management as Follows:

1987 - Present Deputy Director: Division of Reactor Projects, USNRC, Region I

1986 - 1987 Deputy Director (Detail): Division of Reactor Projects, USNRC, Region I

As a member of the Senior Executive Service, responsible for division management; the conduct of inspections and evaluations of assigned NRC programs for all power and non-power reactors within Region I.

1985 - 1986 Branch Chief: Reactor Projects Branch No. 2, USNRC, Region I

Responsible for project management, staffing and budget considerations, including inspections, implementation of SALP, resident inspection and enforcement for eleven assigned power reactor sites in operation and under construction.

1984 - 1985 Section Chief: Reactor Projects Section No. 2C, USNRC, Region I

Responsible for implementation of the routine and reactive inspection program at six assigned power reactors during new construction, testing and operation.

1983 - 1984 Senior Resident Inspector: Operations, Yankee Nuclear Power Station, DRP, USNRC, Region I

Supervised; inspection and event response program at operating Westinghouse PWR power reactor facility.

1980 -1983 Resident Reactor Inspector: Operations, Vermont Yankee Nuclear Power Station, DRP, USNRC, Region I. Field inspector at operating General Electric BWR power reactor facility.

Private Industry:

1971 - 1980	Tenneco Corporation, Newport News Shipbuilding. Various positions as contractor to U.S. Navy Nuclear Program including:
	Project Manager - S5W Steam Generator Chemical Cleaning Project
	Chief Test Engineer - Chairman and NNS representative to Joint Test Group for S5W overhaul and construction
	Shift Test Engineer - Shift supervisor for reactor overhaul and refueling
	Shift Test Engineer - Shift supervisor for reactor new construction
	Mechanical Test Engineer - Shift mechanical test for reactor new construction
	Reactor Design Engineer - Design support for reactor new construction
SPECIAL QUALIFICATIONS:	Senior Executive Service Candidate Development Program, USNRC, 1986 - 1987
	Qualified BWR Resident Inspector
	Qualified PWR Resident Inspector
	Qualified S5W Shift Test Engineer
	Third Engineer License, USCG
SPECIAL ASSIGNMENTS:	1988 - Team Manager, Pilgrim Integrated Assessment Restart Team Inspection
	1987 - 1988 - Chairman, Pilgrim Restart Assessment Panel
	1987 - 1988 - Region I Representative, NRC Training Advisory Group
	1987 - Chairman, Differing Professional Opinion Peer Review Group
	1987 - Chairman, Comanche Peak Task Force Review Group
	1986 - Team Leader, Nine Mile Point 1 and 2 Diagnostic Team Inspection
	1985 - Team Leader, Peach Bottom 2 and 3 Diagnostic Team Inspection

NAME:	LAWRENCE T. DOERFLEIN
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Reactor Projects
TITLE:	Project Engineer
EDUCATION:	BS Electrical Engineering US Naval Academy, 1973
EXPERIENCE:	Fifteen Years Nuclear Experience as Follows:
Aug. 1985-Present	Project Engineer
Oct. 1983-July 1985	Senior Resident Inspector, FitzPatrick Nuclear Power Plant
Nov. 1980-Oct. 1980	Resident Inspector, FitzPatrick Nuclear Power Plant
June 1973-Oct. 1980	US Navy
SPECIAL QUALIFICATIONS:	Certified NRC BWR Inspector
	Qualified Chief Naval Nuclear Engineer
SPECIAL ASSIGNMENTS:	Limerick Readiness Assessment Team
	Pilgrim Augmented Inspection Team

NAME:	THOMAS F. DRAGOUN
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Radiation Safety and Safeguards
TITLE:	Senior Radiation Specialist
EDUCATION:	Rensselaer Polytechnic Institute, and Union College DOD Staff College, Battle Creek, Michigan
EXPERIENCE:	Twenty-Three Years of Nuclear Experience as Follows:
1983-Present	NRC - Senior Radiation Specialist
1983-1969	General Electric Company, which included the following: - Qualified as Operations Engineer and EOOW at Navy Prototype (3 Years) - Senior Engineer on Trident Prototype Construction Project (5 Years) - Health Physicist responsible for service work, both domestic and foreign by Large Steam Turbine Division (6 Years)
1965-1969	Cornell University - Taught Radiation Protection Subjects

NAME:	MICHELE G. EVANS
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Reactor Safety
TITLE:	Operations Engineer
EDUCATION:	B.S., Chemical Engineering, University of Pennsylvania
EXPERIENCE:	Four Years of Nuclear Experience as Follows:
Aug 1987-Present	Operations Engineer, Boiling Water Reactor Section - Conduct review and inspection of Power Ascension Programs at Pilgrim and Nine Mile Point 2. Currently in training to qualify as BWR Operator Licensing Examiner
July 1984-Aug 1987	Reactor Engineer, Test Programs Section - Conducted review and inspection of preoperational test programs at Hope Creek and Nine Mile Point 2, and Startup Testing Programs at Limerick 1, Shoreham, Hope Creek and Nine Mile Point 2.
SPECIAL QUALIFICATIONS:	USNRC Certified BWR Inspector Engineer in Training (State of Pennsylvania)
SPECIAL ASSIGNMENTS:	Currently participating in the Women's Executive Leadership Program for Management Development

NAME:	JEFFREY J. LYASH
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Reactor Projects
TITLE:	Resident Inspector - Pilgrim Nuclear Power Station
EDUCATION:	B.S., Mechanical Engineering, Drexel University
EXPERIENCE:	Six Years Nuclear Experience as Follows:
	Two and One-Half Years - NRC Resident Inspector - Pilgrim Nuclear Power Station
	One Year - NRC Resident Inspector - Hope Creek Generating Station
	One Year - NRC Reactor Engineer - Region I
	One and One-Half Years - Pennsylvania Power and Light Company - Test Engineer - Susquehanna Steam Electric Station
SPECIAL QUALIFICATIONS:	Meritorious Service Award as NRC Resident Inspector of the Year 1987-1988

NAME: DANIEL G. MCDONALD, JR.

ORGANIZATION: United States Nuclear Regulatory Commission (USNRC)
Office of Nuclear Reactor Regulation

TITLE: Senior Project Manager

EDUCATION: B.S., Management, Shenandoah College
A.A., Engineering, Solano College

EXPERIENCE: Thirty-One Years Nuclear Experience as Follows:

1982-Present	Senior Project Manager - Manage and coordinate all NRC licensing functions on assigned operating reactor facilities which have difficulties or complexities with management and operation. (NRC)
1982 (3 Months)	Reactor Engineer (Instrumentation) - Technical evaluations of instrumentation and control systems or licensee applications and operating reactor modifications. Assist in developing regulatory requirements and establishing staff policy. (NRC)
1980-1982	Staff Member - Conduct, direct and coordinate assessments of critical technologies in the context of national security. Provide technical support to the Nuclear Regulatory Commission. (Los Alamos National Laboratory)
1979-1980	Reactor Inspector (Electrical) - Inspects reactors under construction and in operation. (NRC)
1978-1979	Senior Electrical Engineer - Technical evaluations of electrical, instrumentation and control systems. Assist in developing staff policy. (NRC)
1973-1978	Reactor Engineer (Instrumentation) - Technical evaluation for license applications and operating reactors. (NRC)
1966-1973	Senior Technical Associate - Field engineer in nuclear weapons test programs. (Lawrence Livermore Laboratory (LLL))
1964-1966	Senior Electronic Engineering Coordinator - Design of control, interlock and instrumentation systems for critical assembly machines, test reactors and containment vaults. (LLL)
1960-1964	Electronics Designer - Design of communication, personnel warning, closed circuit TV and radiation monitoring systems. (LLL)

1957-1960	Senior Electronic Technician - Fabricated and assisted in the design and development of prototype electrical and electronics equipment. (LLL)
1953-1957	Electrical Specialist - Four year apprenticeship with Department of Navy. (Mare Island Shipyard)

NAME:	LOREN R. PLISCO
ORGANIZATION:	United States Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Division of Licensee Performance and Quality Evaluation
TITLE:	Senior Operations Engineer
EDUCATION:	B.S., Systems Engineering, U.S. Naval Academy
EXPERIENCE:	Eleven Years Nuclear Experience as Follows:
1987-1988	Senior Operations Engineer, NRC:NRR
1986-1987	Senior Resident Inspector - Susquehanna Steam Electric Station
1983-1986	Resident Inspector - Susquehanna Steam Electric Station
1982-1983	Reactor Engineer, Region I
1977-1982	US Navy Nuclear Power Program
SPECIAL QUALIFICATIONS:	Certified NRC BWR Inspector Qualified Naval Nuclear Engineer Officer
SPECIAL ASSIGNMENTS:	Susquehanna 2 - Operational Readiness Assessment Team Inspection Limerick 1 - Operational Readiness Asssessment Team Inspection Hope Creek - Operational Readiness Assessment Team Inspection Salem - ATWS Inspection TMI-1 - Management Integrity Inspection

NAME: WILLIAM J. RAYMOND

ORGANIZATION: United States Nuclear Regulatory Commission, Region I
Division of Reactor Projects

TITLE: Senior Resident Inspector - Millstone Nuclear Power Station

EDUCATION: B.S. Physics
M.S. Nuclear Science and Engineering

EXPERIENCE: Eighteen Years Nuclear Experience as Follows:

1975-1988 NRC Reactor Operations Inspector

- SU&T, Core Physics, Refueling, Pre & SU&T for BV, CC1, IP3, MP2
- Project Inspector - Beaver Valley, Ginna and Susquehanna
- TMI Recovery Team - Accident Response and Containment Entry
- Senior Resident Inspector - Vermont Yankee and Millstone

1972-1975 Startup Engineer, Babcock & Wilcox, Oconee 1 and 2 and Three Mile Island, Unit 1

1970-1972 Reactor Operator, VPI Research Reactor

SPECIAL QUALIFICATIONS: VPI Reactor Operator License

Certified NRC Licensed Operator Examiner - 1986

SPECIAL ASSIGNMENTS: IAEA Assist Visit to Brazil CNEN - 1981

Team Leader Salem ATWS Event - NRC Fact Finding - 1983

Salem ATWS Generic Issue Review Team - 1983

NRC Response to Crystal River Event - 1981

Assist Visit to Region V - WNP2 Startup Readiness - 1982

Team Inspections - Shoreham 1982 and Pilgrim 1986

Operator Briefings of TMI Event - 1979

NAME:	LAWRENCE ROSSBACH
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Reactor Projects
TITLE:	Senior Resident Inspector - Indian Point Unit 2
EDUCATION:	B.S., Nuclear Engineering
EXPERIENCE:	Sixteen Years of Nuclear Experience as Follows:
	Six Years, NRC Resident Inspector and Senior Resident Inspector
	Two and One-Half Years, Program Manager for NRC's preparation to review a high level waste repository license application
	Two and One-Half Years, NRC Project Manager and Reviewer for Uranium Mills
	Five Years, Systems Design Engineer at Architectural Engineering (AE) Company

NAME:	STEVEN C. SHOLLY
ORGANIZATION:	MHB Technical Associates (Observer for the Commonwealth of Massachusetts
TITLE:	Associate Consultant
EDUCATION:	B.S. in Education (1975); Graduate Course Work in Geo-environmental Studies (1976-1977)
EXPERIENCE:	Seven and One-Half Years Nuclear Experience as Follows:
1985-Present	MHB Technical Associates, San Jose, CA - Work in Risk Assessment, Quality Assurance, Operating Events Analysis, and Design and Construction Assessment
1981-1985	Union of Concerned Scientists, Washington, D.C. - Work in generic safety issues, risk assessment and emergency planning

SPECIAL ASSIGNMENTS:

- Member of NRC Peer Review Group, NUREG-1050 (1984)
- Participated in NRC Containment Performance Design Objective Workshop (1986)
- Participated in NRC/LLNL Workshop on Safety Goals Implementation, Presentation on Seismic Risk Assessment (1987)

NAME:	GREGORY C. SMITH
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Radiation Safety and Safeguards
TITLE:	Safeguards Specialist
EDUCATION:	B.S. Education, California State College
	- Various additional courses including: Technical Writing, Quality Assurance Auditing, Statistics, Reactor Design and Layout, Radiological Accident Assessment, Radiological Emergency Response, BWR Technology, Transportation of Radioactive Materials, Advanced Neutron Nuclear Materials Assay, Safeguards Chemical Analysis of Nuclear Materials, Nondestructive Assay of Nuclear Materials, Nondestructive Assay of Fissionable Material, Accident/Incident Investigation and Intrusion Detection Systems
EXPERIENCE:	Twenty-Two Years Nuclear Industry Experience as Follows:
1977-Present	Safeguards Specialist, Physical Protection Inspector and Safeguards Auditor (USNRC)
1966-1977	Westinghouse Electric Corporation, Bettis Atomic Power Laboratory - Production Engineer, Nuclear Materials Auditor, Nuclear Materials Analyst, Reactor Development Technician

NAME:	CLAY C. WARREN
ORGANIZATION:	United States Nuclear Regulatory Commission, Region I Division of Reactor Projects
TITLE:	Senior Resident Inspector - Pilgrim Nuclear Power Station
EDUCATION:	B.S., Natural Sciences, Louisianna State University
Industrial:	1986 - USNRC Inspector Qualification Program
	1985 - Training Program on the General Electric BWR-6 product line and received NRC Senior Reactor Operator License
	1982 - GE Boiling Water Reactor (BWR) Senior Reactor Operator Certification training at the General Electric BWR Training Center
	1980 - Shift Test Engineer training program at General Dynamics Corporation, Electric Boat Division. Successfully completed the Naval Engineering Officer exam administered by Naval Reactors.
Military:	Navy Nuclear Prototype Training Navy Nuclear Power School Electronics Technicians School
EXPERIENCE:	Fifteen Years Nuclear Experience as Follows:
Jan 1987-Present	United States Nuclear Regulatory Commission, Senior Resident Inspector
Jan 1986-Jan 1987	Resident Inspector
June 1984-Jan 1986	Shift Supervisor, Gulf States Utilities Company, River Bend Nuclear Station
Jan 1981-June 1984	Control Operating Foreman, Gulf States Utilities Company, River Bend Nuclear Station
June 1979-Dec 1980	Shift Test Engineer, General Dynamics Corporation, Electric Boat Division
Jan 1971-June 1979	Electronics Technician - Reactor Operator, United States Navy
SPECIAL QUALIFICATIONS:	USNRC Senior Reactor Operators License

SPECIAL ASSIGNMENTS:

Nine Mile Point 2 Operational Readiness Assessment Team Inspection

Peach Bottom - Special Team Inspection March 1986

APPENDIX G

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

01 SEP 1988

The Commonwealth of Massachusetts
Executive Office of Public Safety
ATTN: Mr. Charles V. Barry
One Ashburton Place
Boston, Massachusetts 02108

Dear Mr. Barry:

This refers to our letter of July 13, 1988, regarding the Commonwealth of Massachusetts' participation in the Integrated Assessment Team Inspection (IATI) conducted at the Pilgrim Nuclear Power Station.

As the NRC Senior Manager responsible for the inspection, I would like to acknowledge the conduct of the designated state representatives Ms. Pamela J. Chen and Mr. Steven C. Sholly as being professional and contributing to the performance of the inspection.

The established protocol (enclosed) provided to you on June 1, 1988, clarified by our letter of July 13, 1988, and discussed directly by myself with Mr. Peter Agnes of your staff on August 9, 1988, provides for collection and coordination of the concerns from the various interests within the Commonwealth. As stated in our July 13, 1988 letter, the NRC placed the burden on the Commonwealth's representative to present the many views, be they from the local governments or from the State's Attorney General's office, to the NRC for consideration during development of the inspection scope. In this regard, we understand that Mr. Agnes conducted a public meeting on August 4, 1988, with a designated state representative to the IATI present.

On August 9, 1988, having received no issues from the Commonwealth as an additional input to the existing inspection plan, I contacted the Assistant Secretary of Public Safety directly and was assured that: no formal input to the IATI inspection plan would be submitted by the Commonwealth, the Commonwealth would work through the designated representatives for any issues and that issues brought to the Commonwealth's attention were no different than those previously noted. Also, the team leader has notified me that at no time during the inspection did he receive immediate notification of any different state observation or conclusion as would be called for under Protocol Guideline 3 if any such differences were identified during the inspection.

Since the IATI exit meeting conducted on August 24, 1988 which was attended by Mr. Agnes and Ms. Chen, the Commonwealth has expressed on several occasions both to the media and at public meetings that technical issues and management concerns continue to exist. These statements appear inconsistent with the Commonwealth's response to repeated NRC requests for IATI inspection scope input and moreover inconsistent with the Commonwealth views expressed at the IATI exit meeting.

In order to better understand and address the areas of concern, the NRC requests that in accordance with the protocol agreement accepted by the Commonwealth, as provided for by Guideline 3, that the Commonwealth make available in writing those conclusions or observations that are substantially different from those of the NRC inspectors in order that the NRC can take the necessary actions to meet its regulatory responsibilities.

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Mr. Charles V. Barry 2 01 SEP 1988

It is necessary that the Commonwealth's response be provided to the NRC Region I by September 6, 1988, to be considered in conjunction with the documentation of the results of the recently completed IATI. This request was discussed with Mr. P. Agnes of your staff on August 26 and August 31, 1988.

If you have any questions regarding the above matters, please contact me at (215) 337-5126 or the State Liaison Officer for Region I, Ms. Marie Miller at (215) 337-5246.

Sincerely,

Samuel J. Collins

Samuel J. Collins, Deputy Director
Division of Reactor Projects

Enclosure: As Stated

cc w/encl:
R. Bird, Senior Vice President - Nuclear
K. Highfill, Station Director
R. Anderson, Plant Manager
J. Keyes, Licensing Division Manager
E. Robinson, Nuclear Information Manager
R. Swanson, Nuclear Engineering Department Manager
The Honorable Edward J. Markey
The Honorable Edward P. Kirby
The Honorable Peter V. Forman
B. McIntyre, Chairman, Department of Public Utilities
Chairman, Plymouth Board of Selectmen
Chairman, Duxbury Board of Selectmen
Plymouth Civil Defense Director
P. Agnes, Assistant Secretary of Public Safety, Commonwealth of Massachusetts
S. Pollard, Massachusetts Secretary of Energy Resources
R. Shimshak, MASSPIRG
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
Commonwealth of Massachusetts (2)

bcc w/encl:
Region I Docket Room (with concurrences)
S. Collins, DRP
J. Wiggins, DRP
R. Blough, DRP
L. Doerflein, DRP
R. Bores, DRSS
D. McDonald, PM, NRR

ENCLOSURE

Guidelines for Accompaniment on the Integrated Assessment Team Inspection

The following are guidelines for accompaniment during NRC's Pilgrim Integrated Assessment Team Inspection.

1. The observer is to make arrangements with the licensee for site access training and badging.

2. The observer shall be available throughout the inspection and will accompany NRC inspectors. Communication with the licensee will be through the appropriate NRC team member, preferably the team leader.

3. When the conclusions or observations made by the Commonwealth of Massachusetts observer are substantially different from those of the NRC inspectors, Commonwealth of Massachusetts will make its observations immediately known to the inspection team leader and available in writing to the NRC and the licensee, in order that NRC can take the necessary actions to meet its regulatory responsibilities. These communications will be publicly available, similar to NRC inspection reports.

4. NRC inspectors are authorized to refuse to permit continued accompaniment by the Commonwealth of Massachusetts observer if his conduct interferes with a fair and orderly inspection.

5. The Commonwealth of Massachusetts observer in accompanying NRC inspectors will not normally be provided access to proprietary information. No license material may be removed from the site or licensee possession without NRC approval.

6. The Commonwealth of Massachusetts observer in accompanying the NRC inspectors pursuant to these guidelines does so at his own risk. The NRC will accept no responsibility for injuries and exposures to harmful substances which may occur to the accompanying individual during the inspection and will assume no liability for any incidents associated with the accompaniment.

The Commonwealth of Massachusetts
Executive Office of Public Safety
One Ashburton Place
Boston, Massachusetts 02108

Michael S. Dukakis
Governor
Charles V. Barry
Secretary

APPENDIX H

September 6, 1988

Samuel J. Collins, Deputy Director
Division of Reactor Projects
N.R.C. Region One
475 Allendale Road
King of Prussia, Pa. 19406

Dear Mr. Collins:

This is in reply to your letter dated September 1, 1988, regarding the Commonwealth's participation in the recently completed IATI inspection at Pilgrim Station.

The Commonwealth's observers, Mr. Sholly and Ms. Chan, generally concur with the findings of the IATI team. The Commonwealth's observers followed the prescriptions of paragraph three of the "Guidelines For Accompaniment On The Integrated Assessment Team Inspection" by communicating their observations, concerns and comments about matters considered during the inspection to appropriate N.R.C. personnel during the inspection. The only additional comment we wish to add about the IATI at this time is a recommendation by Mr. Sholly, that in view of the difficulty in one case with implementation of a satellite EOP, that there should be an effort to validate all new plant procedures before restart. Any specific reaction we may have to the written IATI report will, of course, have to await our review of the document.

However, as I pointed out during the recent S.A.L.P. meeting, the Commonwealth reserves the right to disagree with the conclusions drawn by the N.R.C. or the licensee about the IATI findings. For example, notwithstanding what might be considered unmistakable evidence of progress by Boston Edison Company, the Commonwealth remains skeptical of the licensee's readiness to restart at this time. In addition to our concerns about offsite emergency preparedness which have been outlined recently in letters to Mr. Henry Vickers of F.E.M.A., Regional Administrator William Russell, and to the A.C.R.S. Ad Hoc Subcommittee on the restart of Pilgrim, the Commonwealth is concerned that mediocre scores by the licensee during the last

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S.A.L.P. period coupled with a history of poor performance by the licensee have not been taken seriously enough in the staff's evaluation of readiness to restart. If the licensee is unable to achieve S.A.L.P. scores that even equal the national average for licensed commercial nuclear power plants in this country while Pilgrim remains shutdown, why should we believe that the plant is ready to restart?

Some of our other concerns, which transcend the scope of the IATI, are outlined in our letter to the A.C.R.S., a copy of which will be forwarded to you tomorrow.

We appreciate your acknowledgment of the professionalism exhibited by Mr. Sholly and Ms. Chan during the IATI and the cooperation extended to them by the team members and the licensee.

Sincerely,

Peter W. Agnes, Jr.

Peter W. Agnes, Jr.
Assistant Secretary
of Public Safety

PWA/cas

DOCKET NUMBER 50-293 (2.206)
PROD. & UTIL. FAC.

DOCKETED
USNRC

'86 JUL 15 P3:20

UNITED STATES OF AMERICA

BEFORE THE NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

PETITION FOR SHOW CAUSE CONCERNING

PILGRIM I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

DS03

TABLE OF CONTENTS

UNITED STATES OF AMERICA

BEFORE THE NUCLEAR REGULATORY COMMISSION

PETITION FOR SHOW CAUSE CONCERNING PILGRIM I NUCLEAR POWER STATION

JURISDICTION AND INTRODUCTION

Jurisdiction

This petition is filed pursuant to 10 CFR §2.206 and 10 CFR §2.202. The action requested is that an order be issued to the Boston Edison Company to show cause as to why the Pilgrim I Nuclear Power Station Station ("Pilgrim") should not remain closed and or have its operating license suspended by NRC unless and until that time at which the licensee demonstrates conclusively to the NRC and the public: (1) that its management is no longer hampered by the deficiencies noted by the petitioners herein; (2) that the Radiological Emergency Response Plan fully complies with 10 CFR §50.47 and 10 CFR §50.57, is given high organizational priority and sufficient funding by the licensee, the Federal Emergency Management Agency (FEMA), the Massachusetts Civil Defense Agency (MCDA) and local governments; and (3) that the inherent design flaws noted by petitioners herein which render Pilgrim I's containment structure extremely vulnerable in most accident scenarios have been overcome to the extent that the public health and safety will be assured.

The material which follows demonstrates that there is not reasonable assurance that Pilgrim I can be safely operated due to numerous deficiencies in licensee management, the inadequacy of the existing Radiological Emergency Response Plan (RERP), and inherent deficiencies in the Facility's containment structure. The deficiencies discussed in detail below cut a broad swath across the spectrum of safety requirements. It might be argued that one or more of the deficiencies taken individually does not pose an intolerable risk. In the aggregate, however, they thoroughly compromise the reliability of the most important safety systems in the plant and destroy the fundamental principle of defense-in-depth espoused by the NRC.

Both the Pilgrim I licensee, Boston Edison Company, and the NRC staff have failed to resolve these safety issues which have arisen repeatedly throughout the plant's history.

This petition is filed with the Director of Nuclear Reactor Regulation as the licensee is currently shut down. Therefore, it is vital that the Director address and resolve these safety issues before the licensee is granted a firm date for resumption of operations.

In the face of the information presented herein, failure to institute proceedings pursuant to 10 CFR §2.202 by the Director would violate its statutory mandate to ensure the public health and safety.

Description of the Petitioners

William B. Golden is a Massachusetts State Senator representing Cohasset, Weymouth, Duxbury, Hingham, Hull, Marshfield, and Scituate. Frank M. Hynes is a Massachusetts State Representative representing Scituate and Marshfield. Barbara A. Hildt is a Massachusetts State Representative representing Amesbury, Newburyport and Salisbury. These legislators have expressed their concern for their constituents within and around the Plymouth Emergency Planning Zone by involving themselves in the issues surrounding nuclear power in the Commonwealth and particularly in their assistance in producinng this petition.

The Massachusetts Public Interest Research Group (MASSPIRG) is a non-profit citizens group concerned with safe energy, environmental issues and consumer protection. MASSPIRG has over 96,000 citizen members and over 75,000 student members throughout Massachusetts. Approximately 2,000 citizen members live in the plume exposure Emergency Planning Zone for Pilgrim and approximately 7,000 live on Cape Cod for at least part of the year. Because of its concern for the safety and health of the public and the environment, MASSPIRG has long been involved in the issues of nuclear power, especially with regards to the Plymouth nuclear facility. In 1977, MASSPIRG published a study of emergency response plans in Massachusetts entitled "Nuclear Evacuation Planning: Blueprint for Chaos" and in 1983 followed it with an updated study entitled "Blueprint for Chaos II: Pilgrim Disaster Plans Still a Disaster." Since then, MASSPIRG has represented the public interest in public hearings and debates on the issues of nuclear power.

The Plymouth County Nuclear Information Committee, Inc. (PCNIC) is a non-profit Massachusetts corporation with a principle place of business at 50 Congress St, Boston, MA 02109, care of William S. Abbott, Esq. PCNIC is composed of approximately 300 members who reside in and around Plymouth County. PCNIC was incorporated in 1974 for the purpose of educating the public with regards to the hazards, risks and operating characteristics of various applications of nuclear energy, to participate in licensing hearings and other administr tive and legal proceedings involving the use of nuclear energy, and to encourage parties licensed by the Nuclear Regulatory Commission to fulfill their obligations to the public. From 1974 to the present, PCNIC has participated in numerous regulatory and licensing proceedings regarding the Pilgrim I station, and the Pilgrim II station (subsequently cancelled by Boston Edison).

The Plymouth Alliance is a citizens' organization based in Plymouth Massachusetts. Motivated by a concern for the health and welfare of the community, its goal is the establishment of safe energy alternatives. In order to achieve this, the Alliance strives to promote public awareness through education and democratic action.

Jo Ann Shotwell and James M. Shannon are both candidates for Massachusetts State Attorney General.

The remaining signatories of this petition are public officials, organizations and citizens of the Commonwealth who are concerned with the issue of continuing operation of the Pilgrim nuclear facility by the licensee and who endorse the relief requested by the petitioners herein.

Introduction

The three main issues raised herein have to do with Boston Edison's management of plant operations, the Radiological Emergency Response Plan (RERP), and the Pilgrim facility's physical structure.

Part I (sections 1 through 13) of the Statement of the Facts refers to manifestations of the licensee's deficient plant management. The management-related technical and organizational problems listed therein by plant functional area are already known to the NRC, since they are largely culled from NRC inspection reports. As such, they are not presented as specific violations whose past or ongoing presence at Pilgrim in themselves should warrant a plant shutdown; indeed, some are being dealt with by the licensee under close NRC scrutiny. Rather, they are symptomatic of the long history of Boston Edison's incompetence as the manager of a nuclear facility. The most recent SALP report and the April 2, 1986 special inspection report demonstrate NRC's grave concern with the overall quality of Boston Edison's management. As the reports indicate, every year's round of NRC inspections, each of which covers only a fraction of the facility's mechanical and organizational functions, uncover a plethora of new management-related problems. The reports note that many of the specific problems are not resolved by the licensee in a timely fashion or, in some cases, not at all. Recurring problems in such areas as staffing, self-identification of problems, management oversight of operations and attitudes toward problems, equipment maintenance, radiological controls, and surveillance testing, despite repeated promises by the licensee to resolve them, indicate a history of mismanagement and an incapability by Boston Edison to maintain the standards of safety that are required of a nuclear operator. Thus, its continuing operation of the Pilgrim plant poses an extremely serious and unacceptable health and safety threat to the citizens of the Commonwealth.

Part II (sections 14 through 20) detail the failure of FEMA, MCDA and Boston Edison, to develop a Radiological Emergency Response Plan (RERP) that can be given final approval by the NRC. By law, this in itself should be enough to warrant the suspension of a nuclear facility's operating license. However, given Pilgrim's management deficiencies and their threat to safe plant operations, this lack of an acceptable emergency plan should be of even greater concern to the region's public officials and citizenry. The fact that the NRC has granted interim approval of

Pilgrim's RERP does not provide any reassurance to the public's safety and health. Rather, the failure of the RERP to gain final approval by the NRC after many years of plant operation <u>only</u> underscores its unacceptability.

Part III (section 21) deals with the basic deficiencies of the Pilgrim facility's GE Mark I containment structure, which has a very high probability of failure early in the course of severe accident scenarios. This probability of failure is highly significant in light of the facility's managerial problems and the inadequacy of the RERP.

STATEMENT OF THE FACTS

I. MANAGEMENT

1). <u>Licensee's Management of Pilgrim is Deficient.</u>

NRC contends that competent management is critical to ensure the safe operation of any nuclear power facility:

> No level of technical safeguards can make a nuclear facility safe unless it has good management (statement of NRC Commissioners at hearing before U.S. House Subcommittee on Energy Conservation and Power, Boston Globe, May 23, 1986)....
>
> The common denominator at inferior plants is poor management (ibid.)....
>
> Management is the single most important factor in assuring safe plant operations.... There seems to be a history and pattern of poor management and leadership at this site (James Asselstine, telephone interview with the Boston Globe, ibid.).
>
> Management has been weak at the plant for some time and this has had a negative influence on safety (James Asselstine, interview, Boston Globe, May 28, 1986).

The NRC commissioners, who had just ordered the Pilgrim facility to remain shut down temporarily because of safety problems (Boston Globe, May 21, 1986), characterized it as one of the worst run and least safe plants in the nation at the above Subcommittee hearing (Boston Globe, May 28, 1986).

Boston Edison (BECo) has failed to correct managerial deficiencies found as far back as 1982, despite NRC's order to do so through a comprehensive management improvement program. In that year NRC fined BECo a record $550,000 for two safety violations and a material false statement made by management about allegedly resolving one of the violations. NRC concluded that "insufficient review is being given by BECo management to the operation of the Pilgrim facility (NRC 50-293/ EA 81-63, cover letter from Richard C. DeYoung, Director, Office of Inspection and Enforcement). The 1982 events, as described by Mr. DeYoung,

> reveal substantial serious breakdowns in Boston Edison Company's management controls related to the Pilgrim facility. Continued operation of the Pilgrim facility requires significant changes in Boston Edison Company's control of licensed activities. Accordingly, I have determined that the actions set forth below are required by the public health, safety, and interest, and therefore, should be imposed by an immediately effective order (NRC 50-293/EA 81-63, Order Modifying License Effective Immediately, Section IV, p. 6).

The Order Modifying License Effective Immediately specifically demanded:

> -a full evaluation by an independent organization of BECo's organizational responsibilities, management controls, staffing levels and competence, training and retraining programs, communications, and operating practices, with recommendations for improvement;
>
> -a program for assuring that information supplied by BECo to NRC on items "important to safety" is "complete and accurate."
>
> -an evaluation and improvement of the program for plant modifications and design changes to ensure "compliance with the provisions of 10 CFR §50.59;"
>
> -an evaluation and modification of "safety-related procedures and the method used in the development and approval of these procedures" and assurance that plant modifications will be included in written procedures and drawings;
>
> -an evaluation and modification of the program for training and retraining personnel involved in safety-related activities;
>
> -an evaluation and modification of the program for assuring "responsible corporate management oversight" of safety-related activities;
>
> -development of a system of audits by management representatives to assure conformance to procedures and continued adherence to changes dictated by any of the reviews listed above (ibid., Section V, pp. 7-9).

2). Licensee has Failed to Correct Management Deficiencies.

The recent, ongoing history of managerial deficiencies at the Pilgrim plant clearly demonstrates that the management improvement measures demanded by the Order described in section (2) of this petition were never effectively implemented. Special inspection report 50-293/86-06, released April 2, 1986, echoes a theme of managerial weaknesses recurrent since 1982. In this report, NRC found

> four principle factors that are inhibiting progress in these programs and in identifying and correcting other weaknesses. These are (1) incomplete staffing, in particular operators and key mid-level supervisory personnel, (2) a prevailing view in the organization that the improvements made to date have corrected the problems, (3) reluctance, by management, to acknowledge some problems identified by the NRC, and (4) dependence on third parties to identify problems rather than implementing an effective program for self-identification of weaknesses (Inspection Report 50-293/86-06, cover letter from Richard Starostecki, Director, Division of Reactor Projects).

The conclusions highlighted in the most recent SALP report (report no. 50-293/85-99), issued February 18, 1986, similarly refer to the same general managerial problems that NRC identified and demanded that Boston Edison resolve in 1982. They also stressed the safety implications of those problems:

> 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 supervisors was noted to be insufficient. Whether this is due to a lack of supervisors or a lack of policy to foster such work 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.... Another lingering problem is the adequacy of licensed operator staffing (SALP Report 50-293/85-99, pp. 6-7).

3.) Deficiencies in the Area of Plant Operations

The SALP reports covering 1981, 1982 and 1983 give Boston Edison the lowest possible rating in the area of plant operations. In 1985, despite four years of NRC concerns, SALP Report 50-293/85-99 concludes that Pilgrim continues to have serious problems in plant operations, specifically with regards to staffing, operator performance, and response to quality assurance (QA) findings:

> 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 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 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.... 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.... 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 (SALP Report 50-293/85-99, pp. 9-10).

According to the same SALP report, this long-term operator staffing problem has led to serious lapses in operator performance and attention in instances which

> 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 (ibid., p. 11).

Another aspect of the plant operations area which was of particular concern to NRC was licensee response to QA findings. The SALP report determined that

> 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 (ibid., p. 12).

The NRC concluded that safety would be eroded without significant attention to the managerial problems in the area of plant operations:

> 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 (id.).

4). Deficiencies in the Area of Radiological Controls

In the area of radiological controls, BECo has had a history of extremely poor management performance and high worker exposure levels since the early 1980's. The company has proven itself unable to address these problems without constant NRC identification, oversight and direction. Despite demands for a specific improvement program, NRC is still finding fundamental weaknesses in management oversight in its implementation. The latest SALP report still assigns the lowest possible rating to this functional area.

Operations at the Pilgrim facility have been characterized by unplanned radiation releases and occupational exposures that are among the highest in the nation. SALP report 50-293/85-99 places those levels at 4,082 person-rems in 1984. NRC reports, Occupational Radiation Exposure at Commercial Nuclear Power Reactors, NUREG-0713 and NUREG-0714, list the Pilgrim plant among all commercial plants nationwide as having the highest number of man-rems per reactor in the period 1975-1979 and the highest collective dose per reactor in the period 1980-1984. Although the licensee has made efforts to clean up contaminated areas, "recontamination of the clean areas is an ongoing problem" (SALP report 50-293/85-99 p.16).

In reference to ongoing problems with unplanned radiological releases, the SALP report concludes that

> 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....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 second example involved the licensee's oversight of spent fuel pool work. NRC review...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....

> Due to the number and nature of problems identified in the radiological controls area last assessment period (twelve violations and two deviations in radiation protection, three violations in radioactive waste transportation, SALP report 50-293/84-34) 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) (ibid., pp. 14-15).

Despite the implementation of the RIP, NRC has found that

> implementation and effectiveness are not closely monitored....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....The licensee has considerable work yet to do in the area of ALARA Program establishment; procedures; management oversight; and corrective action system (ibid., p. 15).

> 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....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 (ibid., p.16).

Other NRC inspection reports list problems during the RIP implementation. One example is a routine radiological safety inspection carried out during the SALP evaluation period (from May 20 to May 24, 1985) which uncovered a violation of procedures for fuel pool work:

> We are concerned about the violation because it is similar to violations previously identified; and because it had existed for an extended period of time (about a month) prior to being identified by the NRC (Inspection Report 50-293/85-13, cover letter from Thomas Martin, Director, Division of Radiation Safety and Safeguards).

In summarizing the information in the Radiological Control functional area, the SALP report covering this period states that

> 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....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 (SALP report 50-293/85-99, p. 18).

Beside noting that staffing problems still persisted in this functional area, the April 2, 1986 Special Inspection report identifies additional organizational deficiencies:

> Some problems continue to exist between certain Watch Engineers and radiological controls technicians. The communications problems have resulted in some violation of radiological controls procedures, friction between the groups (e.g., maintenance, operations, and instrumentation and controls), and morale problems. Recent examples include poor communications during a recent Gai-Tronics problem, and poor communication during an entry into the AOG building to drain filters. These problems appear to continue in part due to the failure to bring identified deficiencies in this area to the attention of appropriate management for resolution (Inspection Report No. 50-293/86-06, p. 21).
>
> The licensee has not established and implemented an effective radiological controls technician retraining program. This is indicative of inadequate planning considering the number of new procedures which are being established and implemented to meet Radiological Improvement Program (RIP) commitments. Also, the program does not ensure appropriate retraining of personnel being rotated through various jobs (id.).
>
> ALARA group personnel do not receive outage planning schedules, are unaware of the work planning process, and in most instances are unaware of work to be performed more than a day in advance of the work.
>
> The lack of adequate review time could compromise the adequacy and effectiveness of ALARA controls.....
>
> Regarding in-field ALARA controls, observations of radiation protection technicians covering jobs found non-uniform implementation of ALARA controls during work. This is of concern because in some cases, the technicians provide the only ALARA oversight for the job (e.g. "A" priority RWPs)....
>
> An example of poor ALARA planning was the repeated repairs to the clean radwaste pump (Section 5.7). Here, unnecessary repeated repairs were made in areas with radiation levels of 140 mr/hr (ibid., p. 22).

In discussing radiological occurrence reports (ROR), the April 2, 1986 report asserts that the program was found to be less than adequate in that specific problems associated with radiological incidents were not clearly stated and identified problems were not brought to the attention of the appropriate level of station management for their review and resolution (e.g. January 1986 contaminated Watch Engineer ROR) (ibid., p. 22).

The licensee has identified significant problems in the area of use of HP personnel resources to support RWPs which are not used.... The licensee has not clearly identified the cause of this problem and initiated timely, lasting corrective action to address it. At one point up to 75% of daily RWPs were not being used. On a yearly basis, the licensee estimated that unused RWPs could cause up to 26 person-rems of needless radiation exposure to personnel performing radiation surveys (ibid., p. 23).

In the area of Chemistry/Radiochemistry and Effluent Monitoring and Controls, radiological safety inspections have uncovered a number of problems during the RIP implementation period. The May, 1985 routine radiological safety inspection reported one deviation:

> This deviation involved failure to evaluate certain nonradioactive systems and establish appropriate sampling and analysis programs for these systems in order to identify radioactive contamination in a timely manner to preclude any unmonitored, undetected radioactive effluent releases (ibid.).

Another radiological safety inspection conducted August 19-23, 1985 uncovered three unplanned releases. The first involved an "apparent unmonitored release path from the 'Hot' Machine Shop" that "may have existed for some period of time" (Inspection report 50-293/85-22, p.7). The second involved a backed-up drain in the "Hot" Machine Shop:

> The licensee's investigation indicated that liquid in the drain may be directed to the Main Sewage Pumping Station. Since the effluent from this pumping station is directed to an onsite leaching field and the pumping station effluent is periodically pumped out and sent to the Plymouth Sewage Disposal facility, the Main Pumping Station potentially represented an unmonitored effluent release path.... It was determined that the licensee had failed to implement a noncontaminated system sampling program consistent with the requirements of IE Bulletin 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored/Uncontrolled Release to the Environment (ibid., p. 10).

The third instance was described as follows:

> On July 30, 1985, the licensee's Sanitary Sewage System malfunctioned causing an estimated 100 gallons of untreated sewage to flow into storm drains. The drains discharge to Cape Cod Bay via the discharge canal. The licensee investigated the cause and determined it to be inoperable level instrumentation on the sewage tank at the main sewage pumping station (ibid., pp. 12-13).

Another routine radiological safety inspection conducted November 17-22, 1985 uncovered a violation involving "failure to perform monthly tests on waste gas monitors" for the Reactor Building Vent and the Stack Waste Gas Monitors, as required by Technical Specification 4.8 c.10. This resulted in issuance of a Notice of Violation (Inspection Report 50-293/85-32, cover letter from Thomas Martin, Director, Division of Radiation Safety and Safeguards, and Appendix A, Notice of Violation).

The problems that Pilgrim's management has had with monitoring and controlling radiological exposures, effluents and wastes is further demonstrated by its inability or lack of desire to make accurate low level radioactive waste projections. An April, 1985 report by Stone & Webster predicted that the Pilgrim facility's waste would contain about 1024 curies in that year; an updated survey by the Special Legislative Commission on Low Level Radioactive Waste on the waste produced determined that the actual level was 1540 curies, or more than 50% greater than predicted.

5). Deficiencies in the Area of On-Site Preparedness

The deteriorating ratings in the area of Emergency Preparedness over the last two SALP evaluation periods are particularly critical to plant safety and could lead to potentially catastrophic consequences for the region's citizenry. The 1986 SALP report concluded that

> performance was only minimally acceptable in this functional 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 (ibid., p. 27).

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 that the exercise be postponed in order to take time to clarify and complete the exercise scenario....

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. (ibid., p. 26).

6). Deficiencies in the Area of Maintenance and Modifications

Significant deterioration in performance from the previous SALP evaluation period (07/01/83-09/30/84) to the period evaluated by SALP report 50-293/85-99 was noted in the functional area of Maintenance and Modifications. Over time, this lack of diligence in management oversight can lead to serious safety-related equipment deficiencies. The current SALP report cites the following problems:

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 (ibid., p. 20).

Two isolated instances of untimely corrective action (for maintenance findings) 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 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 (ibid., pp. 20-21).

Another problem found in this functional area that is indicative of weak management was an

> interface problem between the corporate staff and the site.... Contractors reporting to offsite licensee engineers improperly installed a test instrument on the high pressure coolant injection (HPCI) system, which made the system inoperable (ibid., p. 21).

Also, NRC found that this functional area suffered from a problem typical throughout the facility, that of "staffing weakness" (id.).

7). Deficiencies in the Area of Surveillance

As in the area of Maintenance and Modifications, BECo's performance rating in the area of Surveillance has experienced significant slippage since the previous evaluation period. In this area NRC found:

> weaknesses in the areas of startup test scheduling, test adequacy, compliance with procedural requirements, and response to abnormal test results.... (ibid., p. 23).

During a slow startup from a 1984 outage,

> 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)....
>
> 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... demonstrated a lack of sensitivity to the finding. Subsequent NRC action could have been avoided if the finding was resolved prior to the startup (ibid., p. 24).

The startup period was marked by additional procedural deficiencies which

> 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 (ibid., pp. 23-24).

The SALP report also described problems in carrying out surveillance tests:

> 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 rates by a factor of sixty....
>
> 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.... 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....
>
> 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 (ibid., pp. 24-25).

In summarizing its evaluation of the Surveillance functional area, the SALP report clearly indicates that weak management oversight has led to lax performance:

> Weaknesses were noted in the response to abnormal surveillance test results, in surveillance test procedural adequacy, and in startup test scheduling. 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 (ibid., p. 25).

Since the 1986 SALP report was issued, many new revelations of surveillance testing deficiencies have been uncovered. The April 2, 1986 Special Inspection Report notes the following problems:

One particular observation that reflected both poor prior planning and control involved recently instituted Inservice Testing (IST) of the HPCI system in procedure 8.5.4.1, HPCI Pump Operability and Flow Rate at 1000...

The test procedure was not promptly changed after the February 21 test. Therefore, the HPCI test could not be performed as required by procedure on March 1, 1986. A new test sequence will be developed to allow proper verification of the minimum flow valve while operating the system.

The deficient procedure in question was reviewed and approved by the ORC without their recognition that 1) the success of the minimum flow check valve test depended on the presence of the auto-initiation signal, and 2) that the 5 second timing valve was incompatible with system design and safety analysis assumptions (Inspection Report, 50-293/86-06).

During the reviews of I&C surveillance procedures, it was noted that the licensee did not fully provide for independent verification requirements for lifted leads or installed jumpers. ANSI Standard 18 7-1976, Section 5.2.6, Equipment Control, specifies that temporary modifications, such as electrical jumpers and lifted electrical leads require independent verification. The ANSI Standard also requires that independent verification of tagging of equipment be performed. During the return to service of the HPCI system on March 1, 1986, it was observed by an inspector that there were tags removed from the system, with valves realigned, without a double verification of the position of the valves (ibid., p. 15).

A Quality Assurance Surveillance, 85-1.2-1, dated January 25, 1985, resulted in issuance of Deficiency Report (DR) No. 1384. This DR was issued to resolve questions about independent verification practices used by I&C personnel during surveillance testing. The Nuclear Operations Manager (NOM) subsequently issued a July 1 , 1985 memorandum M85-137, Control and Verification of Operating Actions, which discussed the method to be used to perform the verifications. The inspector determined that the management objectives of this document were not translated into the maintenance request and tagging procedure (ibid., p. 16).

The inspector expressed concern over an intermittent condition that leaves a residual flow indication of approximately 50 GPM following the reactor core isolation cooling (RCIC) pump operability test, procedure 8.5.5.1. During this test on February 28 and March 1, 1986, the anomalous condition was observed by the inspectors. It was not observed during the test performed on March 2, 1986. Based upon discussion with licensee personnel, it appears that this has been a long standing condition.... However, on March 1, 1986, it was noted that procedure 3.M.3.8 was neither implemented as required by station policy, nor was a second verification of the valving actions performed when returning the transmitter to service (ibid., p. 16).

However, acceptance of a residual flow indication on the RCIC system ...wing a surveillance test was an example of a poor attitude (ibid., p.

> The NRC reviewed the licensee's evaluation of a potentially generic problem (subsequently detailed in IE Information Notice N. 86-13 dated February 21, 1986) involving explosive squib valves used in the Standby Liquid Control System (SLCS).... Bench test firing of a squib valve's explosive charge is and unacceptable test. However, the licensee determined that the squib charges were fired using a bench test, rather than the SLCS firing circuit in 1984. The licensee's failure to perform an in-circuit firing of an explosive charge that came from the same manufactured batch as those installed on April 10, 1984 is contrary to the requirement specified in Technical Specification 4.4.A.2.c and is considered a violation (86-06-07) (ibid., pp. 17-18).

This last instance led to events in which the licensee declared both systems of the SCLS inoperable on February 20, 1986 and initiated a plant shut down. A Notice of Violation was issued with the April 2 Special Inspection Report.

A more recent example of BECo's failure to insure proper surveillance was reported in the June 18, 1986 edition of the Boston Globe. In that instance, Edison failed to perform 90% of the required tests on valves designed to contain the spread of a radioactive leak in case of an accident and 36% of the required tests on leak-detection devices.

Another recent example was reported in the June 24, 1986, edition of the Boston Globe:

> An alarm that warns operators when voltage levels are too low to run emergency systems was due, to be tested in January or February, but plant operators forgot, according to a report filed with the NRC on Saturday.

8). Deficiencies in the Area of Security and Safeguards

In the area of Security and Safeguards, as in other functional areas, staffing deficiencies and weak corrective actions were noted. These criticisms further reflect on the inadequate nature of BECo's management.

> 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 deficiency 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, and 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 barrier. Licensee management should be more aggressive in establishing guidelines and clarifying security program objectives (ibid., p. 28).

In addition to these complaints, inspection number 85-24 revealed a security level III violation for "failure to maintain an adequate vital area barrier" (ibid., Table 5).

9). Deficiencies in the Area of Refueling and Outage Management

The fact that NRC assigned the highest possible rating to the area of Refueling and Outage Management, despite finding obvious and continuing examples of sloppiness and weak managerial oversight, raises questions bout NRC's ability to critically access BECo's performance. The recent SALP report admits that:

> 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 (ibid., pp. 30-31).

Furthermore,

> Weaknesses in the turnover of modification 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 (ibid., p. 31).

10). Deficiencies in the Area of Licensing Activities

The recent SALP report highlights another example of management deficiencies in the area of Licensing Activities. Responses to concerns about technical specifications have been too slow:

> 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 (ibid., p. 33).

11). Deficiencies in the Area of Fire Protection

The April 2, 1986 special inspection report found BECo's performance and management in the area of fire protection to be "weak". The summary states: "A lack of management initiative to reduce the number of station fire watches was evident. Fire watch personnel had minimal training. Several examples of degraded fire protection equipment were observed" (April 2, 1986 Inspection report No. 50-293/86-06, p. 30). The excessive number of Maintenance Requests (MRs) and the presence of numerous fire watches underscores the inability of Edison's management to address deficiencies in a timely manner.

> As of February 14, 1986, there were 72 plant locations requiring fire watches (either continuous or hourly) resulting from 90 separate reasons. The reasons for these watches vary from inoperable fire protection suppression equipment and unsealed penetrations between fire area boundaries to one missing screw on a fire door.
>
> There is a significant backlog of fire protection MRs (over 250) which were open from 1984 to the present. This backlog has contributed to the number of fire watches needed. The FPE indicated that Bechtel was recently tasked to reduce this backlog (ibid., p. 28).

A total of five plant areas have five suppression system deficiencies. These areas are the cable spreading room, emergency diesel generators, recirculation pump motor generator set room, the H2 seal oil system and the standby gas treatment system.

The halon system for the cable spreading room has not been weight tested as required by Technical Specifications. The halon system is connected and considered functional. It is difficult to weight test because of the large size of the halon bottles, lack of sufficient clearance beneath cable trays, and fact that they are restrained by racks for seismic purposes. This condition has existed for about two years without correction. Engineering has been involved with attempting to determine halon quantity in place by a level detection system. An unofficial level was obtained which indicated that there had been no change in quantity in the bottles. It is not clear why this system was not taken out of service temporarily, disassembled, and tested. There appears to have been a lack of management attention to fix this problem and eliminate fire watch in this area.

Preaction sprinkler system for the emergency diesel generators (EDG) is inoperable due to a design problem (ibid., p. 28).

The deluge system for both trains of the standby gas treatment system is inoperable due to the manual block valves being tagged shut. This condition stems from an incident in 1983 in which a leaking valve caused wetting of a charcoal filter bed, and the system has been inoperable since that time. This appears to be another case where a fire watch has been used in lieu of achieving problem resolution.

The inspectors were also concerned with the level of training provided to the contractor fire watches. Several fire watches were interviewed to determine their responsibilities and level of training. With the exception of fire watches for hot work, most of the contractor fire watches have little training in fire fighting including use of fire extinguishers. Licensees procedure for fire watches specifies that the fire watches primary duties are to inform the control room in the event of a fire.... In addition, the fire door connecting the 'A' and 'B' EDG rooms is blocked open to allow one fire watch instead of two. However, two individuals who manned this position stated that they had received no instruction to shut this door to prevent fire spread. This is another example of lack of management initiative to correct a long standing problem (ibid., p. 29).

An example of particularly sloppy performance and oversight was the following:

On February 28, the inspector again examined the D/G fire pump conditions. A portable electric heater using an ungrounded plug was directed at the battery in an attempt to keep battery cell temperatures within normal range. The heater was connected to an extension cord and the connection was laying on the room floor. If the D/G fire pump had started, this area was likely to get very wet from the leaking relief valve. The inspector considered this to be a safety hazard, and brought it to the attention of the NWF (ibid., p. 30).

> The room heating system for the diesel generator (D/G) fire pump was found to be out of service due to a frozen motor. As a consequence, the cell temperatures for the fire pump battery were below specification. This condition had existed since December 1985 (Id.).

12). Deficiencies in Licensee Management Manifest in All its Endeavors

Boston Edison's Company's deficient management was the subject of an extremely critical report issued by the Massachusetts Department of Public Utilities on June 26, 1986. This report indicates that these management problems are not restricted to the operation of the Pilgrim facility but rather were manifested in all of the company's endeavors. It announced the refusal of a BECo request for $35 million rate increase and lowered the licensee's allowable rate of return on common stock from 15.25% to 12%, stating:

> We have grave concerns about the ability and desire of Boston Edison's management to carry out its public service obligation. Based on the evidence in the record of this case and other recent cases involving the company, we conclude that there is a pervasive attitude within the company's top management, that unless ratepayers underwrite the business risks associated with the company's operations, it is not required to act in a manner consistent with its public service obligation....If the company continues to combine an abdication of its responsibility for capacity expansion planning with an approach that undervalues the potential for C&LM programs, it will jeopardize the health and safety of its customers and the economy of the region. The company's apparently cavalier attitude toward these impending consequences is a development which we regard with extreme alarm (DPU Report, from excerpts printed in the Boston Globe, June 27, 1986).

Although the problems outlined in the report are not directly related to operations at the Pilgrim facility, Paul F. Levy, DPU chairman, "said that in terms of management alone, the Pilgrim problems 'may be symptomatic' of Boston Edison's entire operation" (ibid.). Boston Edison's lack of social responsibility manifests itself at the Pilgrim facility in the kinds of managerial and organizational deficiencies that have been described herein to have been of great concern to the NRC for a number of years.

13). Statement of Law as it Applies to Standards of Management

The Atomic Energy Act, 42 USC §2236(a), provides for the revocation, suspension or modification of a license if any information is disclosed from "report, record, inspection or other means which would warrant the Commission to refuse to grant a license on an original application." Furthermore, the Commission has held that "public safety is the first, last and a permanent consideration in any decision on the issuance of a construction permit or a license to operate a nuclear facility." Power Reactor Development Corp. v. International Union of Electrical Radio and Machine Workers, 367 U.S. 396, 402, 81 S.Ct. 1529 (1961). The Supreme Court, in that case, emphasized that even after a reactor is licensed for operation, the Commission will retain jurisdiction "to ensure that the highest safety standards are maintained." Power Reactor, supra, 367 U.S. at 402, 81 S.Ct. at 1532.

However, since the NRC is able to oversee or inspect only a fraction of the organizational and technical functions of a nuclear facility, it must rely on the management of the utility to honestly, accurately and timely identify safety problems, to perform objective analyses, to propose solutions and to provide a great deal of data necessary for NRC to perform its duties. Petition for Emergency and Remedial Action, CLI-78-6, 7 NRC 400, 418-419 (1978). Unless the licensee demonstrates a full commitment to safety, "it is beyond the power of regulators to put an appropriate program in place." Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), LBP-82-56, 16 NRC 281, 358 (1982). Thus, the NRC must rely heavily upon the licensee's competence to manage the facility's operations so as to ensure that the public safety standards are maintained. In the case of the Pilgrim nuclear facility, the foregoing sections of this petition describe how the NRC tried in 1982 to get Boston Edison to "put an appropriate program in place," to improve management so as to ensure safe plant operation and how, in numerous reports and public statements issued within the last year, both the NRC and the Massachusetts Department of Public Utilities have expressed their determination that a high degree of management incompetence still remains, despite those efforts by the NRC in 1982. The NRC itself has stated that it indeed cannot rely upon the licensee to honestly, accurately and timely identify safety problems at the Pilgrim facility. In fact, it reports that licensee management suffers from a defensive attitude toward perceived weaknesses that "inhibits a thorough and critical evaluation with subsequent delays in resolving the problem(s)" (Section 2 herein). Because of management's inability or lack of commitment to prevent, identify and resolve organizational and operational problems, NRC itself has recognized that safety standards are not being adequately maintained as required for the retention of an operating license. Although through its inspection reports and regulatory oversight the NRC "encourages excellence in operations," Commissioner Asselstine admits, "however, the commission too often accepts far less" (James Asselstine, The Patriot Ledger, July 9, 1986).

II. EMERGENCY RESPONSE PLAN

14). Deficiencies in the Radiological Emergency Response Plan (RERP)

Nuclear Regulatory Commission (NRC) regulations provide that no full power operating license shall be issued by the NRC unless the NRC finds "that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency" (10 CFR §50.47 (a)(1)). The NRC lists sixteen particular standards which must be met by the emergency response plans (10 CFR §50.47 (b)). More detailed specifics for RERP's are set out in "Emergency Planning and Preparedness For Production and Utilization Facilities" found at 10 CFR Part 50, Appendix E. The NRC generally bases its finding of adequacy of RERP's upon a review by the Federal Emergency Management Agency (FEMA) of state and local emergency plans (10 CFR §50.47 (a)(2)). The NRC and FEMA have issued "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness In Support of Nuclear Power Plants," NUREG-0654/FEMA-REP-1, Rev. 1, November, 1980 (hereinafter

"Evaluation Criteria"). The evaluation criteria are relied upon by state and federal agencies to set up and evaluate RERPs.

Both the NRC (10 CFR §50.100, §50.54 (e)) and FEMA (44 CFR §350.13) are empowered to withdraw their approval of plans that do not adequately protect the public. The NRC can revoke, suspend or modify a license to operate a nuclear power plant (10 CFR §50.100).

Serious deficiencies exist in the RERP for Pilgrim, warranting suspension of Boston Edison's operating license by the NRC. The deficiencies are outlined below. The combined effect of these deficiencies is to abrogate the "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency," the standard set by 10 CFR §50.47 (a) (1).

15). Deficiencies in Advance Information

a). The only method being used for advance public education in the Pilgrim Emergency Planning Zone (EPZ) is the distribution of pamphlets by mail. A MASSPIRG telephone survey conducted in 1983 revealed serious inadequacies in the distribution, retention and understanding of the pamphlets by area residents. No improvements in the advance information procedures have been carried out since 1983.

b). The current (September, 1985) pamphlets contain no information regarding public transportation for purposes of evacuation, despite the fact that the Radiological Emergency Response Plan (RERP) for the Town of Plymouth provides for thirteen "staging areas" where persons without transportation will be directed for "possible" public transport.

c). The advance information system for tourists and other transients is inadequate or nonexistent. For example, no signs have been posted to provide appropriate information for transients, a measure suggested by the NRC in 10 CFR Part 50, Appendix E. IV. D. 2.

d). The inadequate advance information system violates 10 CFR §50.47 (b) (7); 10 CFR Part 50, Appendix E. IV. D.2, and Evaluation Criteria G.1, G.2 and P. 10 of NUREG-0654.

16). Deficiencies in Notification During An Accident

The warning siren system and back-up systems are inadequate to essentially complete the initial notification of the public within the plume exposure pathway of the Emergency Planning Zone (EPZ) within fifteen minutes, as required by 10 CFR Part 50, Appendix E., IV. D.3. For example, the siren system has been plagued with false alarms. Rather than correct this problem, the response has been to disconnect the siren system during electrical storms. The sirens are inaudible or barely audible within large areas of the EPZ (Report on the Pilgrim Nuclear Power Station Siren Test, June 19, 1982, FEMA, January, 1983, p. 6). Furthermore, federal regulations require notification of "all segments" of the population (Criteria J. 10. c, E.6; 10 CFR Part 50, Appendix E, IV. D. 3). Clearly, the deficient siren system would fail to warn the hearing impaired; testimony at the June 18, 1986 hearing on the Pilgrim RERP before Massachusetts legislators provided no evidence of the existence of an alternate plan for notification of this segment of the population, a direct violation of this statutory mandate.

Further, in testimony before Massachusetts State legislators on June 18, 1986, Edward A. Thomas, Division Chief, Natural and Technological Hazards, FEMA, stated that Boston Edison had failed repeatedly to deliver to FEMA necessary technical specifications on the siren system. Mr. Thomas added that these delays by BECo have forced repeated postponements of the full-scale system test required by FEMA.

17.) Deficiencies in Evacuation Plans

a). The evacuation time estimates for the Pilgrim EPZ are unrealistically low. They fail to take into account the probability of some panic, traffic disorder, traffic obstacles outside the EPZ and the fact that thousands of people outside designated evacuation zones will also evacuate. According to testimony before Massachusetts legislators on June 18, 1986, by Edward A. Thomas, Division Chief, Natural and Technological Hazards, FEMA, the "reasonable assurance" adequacy of the current plan is based on the assumption that communities outside of the ten mile EPZ have developed plans to augment evacuation and sheltering efforts. When asked, Mr. Lubering, Deputy Director of the Massachusetts Civil Defense Agency (MCDA), stated that he had no evidence that such plans exist. Furthermore, evacuation time estimates are not provided for various adverse weather scenarios.

b). There are no workable plans for evacuating the physically disabled, nursing home residents, school children, hospital patients, campers, inmates of correctional facilities, or people without automobiles. In light of the deficiency noted in c.) below (lack of contractual agreements with transportation providers), general statements in the plan to the effect that these groups will somehow be evacuated are meaningless and unrealistic.

c). Testimony by FEMA and MCDA officials at the June 18, 1986 hearing on the Pilgrim RERP indicated that there are no contractual agreements with bus companies or bus drivers, ambulance companies, or any other transportation providers for thousands of people who cannot drive or may not have an automobile. No drivers have been trained in their supposed role in evacuation plans. In fact, no drivers have been informed that they have a role in evacuation plans. Furthermore, the proposed route of such evacuation (Routes 3 North and 44 West) are completely inadequate to effectively handle the anticipated volume of traffic. This is particularly true during the summer months due to the heavy volume of tourists heading to and from Cape Cod.

18). <u>Deficiencies in Medical Facilities</u>

a). Various NRC and FEMA regulations require that arrangements be made for medical services for contaminated injured individuals (10 CFR §50.47 (b) (12); 10 CFR Part 50, Appendix E. II. E. and IV. E. 7; Evaluation Criteria L.1 and L.3). The plan makes inadequate provision for treatment of victims of radioactive contamination. A MASSPIRG 1983 study of the two hospitals listed in the plan then in effect revealed they have a total capacity to treat only eight or nine victims of radioactive contamination. One of these (Jordan Hospital, Plymouth) is within four miles of the plant, so it may need to be evacuated. The other (Morton Hospital, Taunton) in 1983 had no staff trained for radiological accidents. No data suggests the situation has materially improved since 1983.

b). The plan fails to provide for the distribution of radioprotective drugs for the prevention of thyroid tumors to the general public or to persons in institutions who may not be evacuated. The NRC and FEMA recommend distribution of such drugs at least to such institutionalized persons (Evaluation Criteria, J. 10. e. and J. 10. f.

19). The Emergency Planning Zone Is Too Small

a). The Environmental Protection Agency recommends protective measures by the public when radiation exposure is likely to exceed the EPA "protective action guide" of one rem (Manual of Protective Action Guide and Protective Actions for Nuclear Accidents, EPA-520/1-75-001, EPA, 1975.

b). NRC regulations require the exact size and configuration of each EPZ to be "determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries." Generally, the NRC provides, the plume exposure EPZ should be about ten miles in radius (10 CFR Part 50.47 (c) (2)). Boston Edison Company has admitted that the only factor used to create the Pilgrim EPZ was jurisdictional boundaries (response of Boston Edison Company to Commonwealth of Massachusetts' First Set of Interrogatories on Emergency Planning, July 20, 1981, p.2).

c). Cape Cod begins just eleven miles from Pilgrim and is connected to the mainland by only two bridges. There is no emergency planning for Cape Cod, nor public education of protective measures, nor warning sirens. However, there are plans to close the Cape Cod bridges to prevent its evacuation, so as to give preference to evacuatees within the plant's 10-mile radius. This is totally unacceptable to the people on the Cape, who would be in the path of a radioactive plume if the the wind were blowing toward the Cape. Even if they were allowed to evacuate the Cape over the connecting bridges, they would be doing so in the direction of the plant and the source of the radiation. The issue of evacuating Cape Cod is extremely important in the light of the Chernobyl accident, since there the radioactive plume extended much further than 10 miles.

d). Basing his conclusion upon NRC data, the Attorney General of Massachusetts has concluded that the size of the Pilgrim EPZ is inadequate (comments of Attorney General Francis X. Bellotti Relative to Off-Site Emergency Planning for the Pilgrim Nuclear Power Station, submitted to FEMA, August 1982).

20). Lack of Coordination and Prioritization of the RERP

The NRC should suspend the operating license of the Pilgrim power plant until a realistic, detailed RERP is developed, showing an actual capability to educate, alert, treat and efficiently evacuate all people who may be at risk from a catastrophic accident at the plant. Federal, state and local government agencies, as well as Boston Edison, have all accorded a low priority to emergency planning. Instead of trying seriously to devise a plan that will protect all of the public, planners have sought to achieve only minimum compliance with NRC regulations; as sections 13 through 18 of this petition demonstrate, they have failed to do even that. This insufficient commitment to public protection is evident in missed deadlines, slow processing of paperwork, lack of attention to detail and inadequate budgets and staffing.

To date, FEMA has largely acquiesced in plans that fail to demonstrate a capability to adequately respond to an actual emergency, and FEMA's acquiescence has been emulated by the NRC. Where FEMA has criticized parts of the plan, the Massachusetts Civil Defense Agency (MCDA) has not responded in a timely fashion to FEMA's concerns. For example, according to testimony before Massachusetts state legislators on June 18, 1986, by Edward A. Thomas of FEMA, the agency sent letters outlining persistent FEMA concerns to MCDA in October, 1985 and January, 1986. FEMA received no response to the October letter until June 6, 1986, and FEMA had not yet received a response to the January letter by the time of the hearing. Another example of the serious lack of coordination was the failure of MCDA to deliver to FEMA an up-to-date version of the state emergency plan. According to statements by FEMA and MCDA officials in the June 28, 1986 edition of the Patriot Ledger of Quincy, MA, the plan was not delivered until 10 months after it was prepared. MCDA completed the updated plan in August, 1985 but did not deliver a copy of it until June 25, 1986. FEMA had formally requested a copy of the plan in October, 1985, but did not follow up on that request. MCDA's failure to respond to FEMA's request and FEMA's evident lack of concern and unwillingness to demand more responsive action are symptomatic of an emergency response regime that is uncoordinated and given low priority by its attendant public agencies.

Further evidence of this lack of coordination and prioritization was revealed in Mr. Thomas' June 18, 1986 testimony. Mr. Thomas stated that Boston Edison had failed repeatedly to deliver to FEMA necessary technical specifications on the sirens that would notify the public of a radiological emergency at the Pilgrim plant. Mr. Thomas stated that these delays by Boston Edison have forced repeated postponements of system testing. Thus, the system has never been given the full-scale test required by FEMA.

The emergency response system's lack of prioritization is further demonstrated by the fact that local civil defense agencies in the communities within the Emergency Planning Zone have serious staffing and budgetary problems. Most local civil defense directors within the EPZ are unpaid or receive only small stipends. Most have little or no paid staff. The reliance on volunteers, who often have minimal professional experience or training, reflects the unwillingness of state and local government to make a genuine commitment to emergency response planning. Major improvements in staffing and budgets of state and local civil defense bodies must be implemented before public safety can be ensured. Moreover, lest the necessary measures taken constitute public subsidization of the financial requirements of a safe nuclear power system, Boston Edison should be required to provide the financial means for them.

III. CONTAINMENT STRUCTURE

21.) Inherent Design Flaws of Pilgrim's Containment Structure

The General Electric Mark I pressure-suppression system employed by the Pilgrim reactor contains inherent design flaws which raise serious questions about its ability to withstand a severe accident:

> A pressure-suppression containment system has some means of absorbing the heat of the steam in the fluid released to the containment volume. In all three GE models, the steam is forced to bubble through a pool of water and is condensed....If some unexpected event should result in steam generation or flow greater than the suppression capability, then the steam that is not condensed would add an increment of containment pressure. Since the objective of pressure-suppression is to permit use of smaller containment, rated at lower pressure than would be required without suppression, the incomplete suppression would lead to overpressurizing a pressure-suppression containment so designed (AEC internal report by Dr. Stephen Hanauer, September 20, 1972).

The containment structure employed at the Pilgrim reactor is rated to withstand 62 pounds per square inch of pressure from steam and other gases. In comparison, the containment structure employed at the Chernobyl reactor (also a pressure-suppression system) was rated to withstand 57 pounds per square inch of pressure (Boston Globe, May 26, 1986).

The AEC internal report by Dr. Hanauer goes on to state:

> All pressure-suppression containments are divided into two (or more) major volumes, the steam flowing from one to the other through the condensing water.... Any steam that flows from one of these volumes to the other without being condensed is a potential source of unsuppressed pressure. Neither the strength nor the leakage rate of the divider (between the volumes) is tested in the currently approved programs for initial or periodic inservice testing.... Because of the limited strength against collapse, the "receiving" volume has to be provided with vacuum relief. In all designs... this function is performed by a group of valves. Such a valve stuck open is a large bypass of the condensation scheme; the amount of steam that thus escapes condensation can overpressurize the containment. Valves do not have a very good reliability record (AEC internal report by Dr. Hanauer, supra.).

As to the probability of such overpressurization, the AEC has stated:

> GE claims two passive failures are required for trouble, but any malfunction of 12 vacuum relief valves, not easily inspected in the torus, over 40 years will set up half the accident, ready for trouble if a steam leak occurs. The GE position that this is too improbable to worry about is rejected (Task Force Review, Bypass Effects in GE Pressure Suppression Containments, November 9, 1971 and December 1, 1971).

This situation is exacerbated by the inability to carry out proper tests of the pressure-suppression system:

> The smaller size of the pressure-suppression containment, plus the requirement for the primary system to be contained in one of the two volumes, has led to overcrowding and limitation of access to reactor and primary system components for surveillance and in-service testing.... A pipe break in one of these compartments creates a pressure differential; each compartment must be designed to withstand this pressure. A method of testing such designs has not been developed (AEC internal report by Dr. Hanauer, Supra.).

The implications of the problem with the pressure-suppression containment in the GE reactors was not lost to the AEC:

> The problem is germane to all past and present GE pressure-suppression containments. About 40 such are already approved.... GE wants us and ACRS not to mention the problem publicly. They are afraid of delaying hearings in progress.... In any event, this is potential trouble for the Vermont Yankee and Pilgrim hearings; it will have to be faced and a real solution found (Task Force Review, Supra.).

Given his concerns about the problem, Dr. Hanauer formulated his own solution, concluding his study by recommending the following:

> Recent events have highlighted the safety disadvantages of pressure-suppression containments. While they also have some safety advantages, on balance I believe the disadvantages are preponderant. I recommend that the AEC adopt a policy of discouraging further use of pressure-suppression containments, and that such designs not be accepted for construction permits filed after a date to be decided (say two years after the policy is adopted) (ibid.).

AEC official Joseph M. Hendrie found Dr. Hanauer's recommendation to ban pressure-suppression containments an "attractive one in some ways," but ultimately rejected it, stating:

> However, the acceptance of pressure-suppression containment concepts by all elements of the nuclear field, including Regulatory and the ACRS, is firmly imbedded in the conventional wisdom. Reversal of this hallowed policy, particularly at this time, could well be the end of nuclear power. It would throw into question the continued operation of licensed plants, would make unlicensable the GE and Westinghouse ice condenser plants now in review, and would generally create more turmoil than I can stand thinking about (memo from Joseph M. Hendrie to John F. O'Leary, September 25, 1972).

Clearly, this decision to disregard Dr. Hanauer's recommendation demonstrates that the AEC was much more interested in preserving the interests of the nuclear power industry than in assuring public health and safety. In fact, Dr. Hendrie's response was embarrassing enough to the AEC that it was withheld from the FOIA both prior to an after Dr. Hendrie's confirmation as Chairman of the NRC, despite FOIA's specific request for all responses to Dr. Hanauer's recommendation (Union of Concerned Scientists, "An Analysis of Chairman Hendrie's Response to Senator Hart's Letter of June 15, 1978," December, 1978, pp. 1-2).

Dr. Hendrie has defended his September 25, 1972 reply to Dr. Hanauer's recommendation by stating that Dr. Hanauer offered his September 20, 1772 memo simply as "an idea to kick around" and that its main conclusion was that

> it was more trouble than it was worth to work out the review issues in the GE containments, and the concept ought to be discouraged. I thought we should not reject a containment system just because it was harder to review and required more staff effort (Joseph M. Hendrie, letter to the editor, New York Times, June 21, 1986).

This representation of Dr. Hanauer's memo by Dr. Hendrie is is highly misleading. Although Dr. Hanauer did complain about the inadequacy of testing components of the pressure-suppression system, his conclusion, as quoted in full above, reads very clearly- he felt that the safety disadvantages of the GE pressure-suppression containments warranted the end of their use in the industry.

Dr. Hanauer did assert in a June 20, 1978 memo to Dr. Hendrie that his current opinion was that there was adequate assurance of safety in the GE pressure-suppression containments, and that that had been his opinion in 1972 as well. However, a memo that he wrote in early 1973 lists, among other problems:

> Bypass Paths on BWR Pressure Suppression Containments. I think this is a real problem. Please note my memorandum of September 20, 1972, copy enclosed (S. H. Hanauer, memo to E. J. Bloch, January 15, 1973).

It seems obvious that Dr. Hanauer believed on January 15, 1973 that his September 20, 1972 conclusion on the lack of safety in GE pressure-suppression containments was accurate. The very different tone of his 1978 memo "leaves the public to decide whether his 1978 memo which was prepared for public consumption or his 1972 memo which the NRC tried to withhold from the public represents the truth" (Union of Concerned Scientists, "An Analysis of Chairman Hendrie's Response to Senator Hart's Letter of June 15, 1978," pp. 11-12).

The reason for the difficult position that Dr. Hendrie found himself in when responding to Dr. Hanauer's memo in 1972 is attributable to the fact that GE plants were being licensed and built before safety problems were solved. In order to justify licensing, the NRC "staff makes 'judgements' in the absence of the proof of safety" and subsequent attempts to "solve the safety problems are portrayed to the public as 'confirmatory in nature'" (ibid., p.12). As the Union of Concerned Scientists analyses indicate, NRC's confirmatory tests, such as those presented in NUREG-0474, often fail to produce expected results. The December, 1978 analysis summarizes three such cases in NUREG-0474: pool swell hydrodynamics were larger than expected; flow rates into the wet well were not well simulated; and "tests of the 'magnitude and character of hydrodynamics LOCA related air clearing loads on the Mark I containment system... have revealed that the anticipated load reduction due to three dimensional effects may not be realized'" (NUREG-0474, from UCS, supra, p. 13).

As the 1978 UCS analysis concludes, the practice of licensing plants before testing is completed and safety assured is that it is impossible for the NRC to enforce its own regulations. "Once plants are in operation, the pressures are enormous to allow them to continue in operation" (ibid., p. 15). Thus, plants with GE pressure-suppression designs, such as the GE Mark I containment structure at the Pilgrim plant, have been allowed to operate despite safety design flaws that have been known to the AEC/NRC for a decade and a half.

A substantial part of the problem in using "judgements" in licensing plants with design flaws like Pilgrim's Mark I containment has had to do with the probability risk assessments (PRAs) that the NRC has typically performed and the perception of risk that they entail. According to a study released by the Union of Concerned Scientists earlier this year, PRAs do not take into account some very important factors, such as the aging or structures; technical specification violations and temporary exemptions from specifications; construction defects and weaknesses; partial system failure sequences; and external factors such as earthquakes, fires, or sabotage (Steven Sholly and Dr. Gordon Thompson, "The Source Term Debate," Union of Concerned Scientists, January, 1986).

The Sholly and Thompson depict various accident scenarios and containment failure modes which are not taken into account in PRAs. Some of these entail a situations in which the concerns raised in Dr. Hanauer's 1972 memo may be realized. For instance, the safety/relief valves (SRVs) to limit reactor pressure by discharging to the suppression pool are located on the main steam lines inside the drywell. If a discharge line passing through the air space above the suppression pool were to break in the wet well space following a stuck-open SRV in that line, "steam would bypass the suppression pool and rapidly pressurize the containment" (Sholly and Thompson, supra, p. 4-17). Another type of scenario involves the failure of the residual heat removal system and subsequent inability to circulate suppression pool water, which could lead to containment failure. A third type of scenario mentioned in the study involves station blackout sequences (Sholly and Thompson, supra, Chapter 4).

Other scenarios not accounted for in PRAs include interfacing loss of coolant accident (LOCA) sequences, Mark I/II sequences with exploding hydrogen in de-inerted containment, reactor vessel rupture, main steam isolation valve (MSIV) leakage, and steam explosions (ibid., pp. 4-18 to 4-22). As the study asserts, "the failure to include important sequences such as these means that the estimated nuclear risks will necessarily be underestimated" (ibid., p. 4-1).

The tendency to underestimate the probability of various types of accidents, especially very serious ones, has had serious implications for nuclear facility construction. Nuclear manufacturers tended toward the lighter GE Mark designs because their lower pressure containment requirements and lighter designs were attractive economically. However, as stated recently by Commissioner Asselstine,

> as is apparently the case with the Soviet reactors, our reactors were not designed for large-scale core meltdown accidents. Because such accidents were assumed to be so unlikely as to be incredible, they were judged to be outside of the design basis for the plants. One consequence of this assumption is that U.S. reactor containments were designed to withstand the rupture of a large steam pipe but were not designed to withstand large-scale core meltdowns....There are accident sequences for U.S. plants that can lead to rupture or bypassing of the containment in U.S. reactors which would result in the off-site release of fission products comparable to or worse than the releases estimated by the NRC staff to have taken place during the Chernobyl accident (James Asselstine, statement before the Subcommittee on Energy Conservation and Power, May 22, 1986).

Similarly, in NUREG-0956, Reassessment of the Technical Bases for Estimating Source Terms, the Containment Loads Working Group obtained study results that "lead on to conclude that Mark I failure within the first few hours following core melt would appears rather likely" (NUREG-0956, July, 1985).

In the sobering light of the Chernobyl disaster, the issue of the inadequacy of the GE pressure-suppression containment has been raised again. The fact that the same problems still remain was underscored recently by the NRC's top safety official, Harold

Denton, Director of NRC's Office of Nuclear Reactor Regulation, who urged the nuclear industry to give top priority to resolving the containment structure problem:

> I don't have the same warm feeling about GE containment that I do about the larger dry containments. There has been a lot of work done on those containments, but Mark I containments, especially being smaller with lower design pressure- and in spite of the suppression pool- if you look (at the) WASH 1400 reg safety study, you'll find something like a 90% probability of that containment failing (Harold Denton, quoted in Inside NRC, Vol. 8 No. 12, June 9, 1986).

The lesson of Chernobyl was not lost on Mr. Denton, who went on to say to industry leaders,

> We can argue about the probability of severe core damage for a long time. I think the political climate is such that people are willing to concede that maybe they (severe accidents) will happen now and then at U.S. plants, despite the best efforts of everyone (ibid.).

Taken by itself, the high probability that Pilgrim's GE Mark I containment structure will not withstand various severe accident scenarios is a very serious factor threatening public health and safety within the region. However, the additional factors of deficient plant management, which greatly increases the probability of a severe accident taking place, and an inadequate Radiological Emergency Response Plan, which will fail to protect the public in case of a serious mishap, add up to an intolerable potential for disaster.

CONCLUSION

The petitioners have demonstrated herein that the managerial and structural problems of the Pilgrim nuclear facility, as well as the inadequacy of its Radiological Emergency Response Plan, combine to prevent any reasonable assurance whatsoever that "the highest safety standards are maintained," as is deemed necessary by the NRC in the case of facilities with existing operating licenses. (Power Reactor, supra, 367 U.S. at 402, 81 S.Ct. at 1532). Since in fact the health and safety of the region's inhabitants are gravely threatened by each of the above factors working both independently and in conjunction with each other, the petitioners request that the NRC issue an order to the Boston Edison Company to show cause as to why the Pilgrim facility should not remain closed, and initiate proceedings to suspend Boston Edison's operating license (#DPR-35), unless and until that time at which the licensee demonstrates conclusively to the NRC and the public: (1) that its management is no longer hampered by the deficiencies noted by the petitioners herein, which have brought the licensee under the criticism of the Massachusetts Department of Public Utilities and have resulted in the NRC commissioners identifying the Pilgrim plant as one of the worst run in the nation; (2) that the Radiological Emergency Response Plan is in full compliance with the provisions of 10 CFR §50.47 and 10 CFR §50.57, is given high organizational priority and sufficient funding by the licensee, FEMA, MCDA, and local governments, and has practical application over a wide range of serious accident scenarios; and (3) that the deficiencies that render the facility's structure extremely vulnerable in most accident scenarios have been overcome to the extent that public health and safety will be assured even under severe accident scenarios. In the latter case, the petitioners request that the NRC require Boston Edison to submit a feasibility study on all possible structural modifications prior to NRC approval of specific modification proposals. The petitioners also request that, subsequent to the operating license suspension, the NRC provide to the public full documentation of the factual basis for any determination it makes pursuant to the lifting or revision of the operating license suspension.

Furthermore, the petitioners request that the NRC, prior to making a decision pursuant to issuing an operating license suspension, schedule a comprehensive public hearing to address the issues raised by the petitioners herein. Such a hearing should address other related issues, including but not limited to Pilgrim's relationship to present and future regional energy needs.

APPENDIX A*

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)

*Reprinted from SALP report 50-293/85-99

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	7/15/85-8/19/85	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

APPENDIX B*

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).

*Reprinted from SALP report 50-293/85-99

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.

Appendix C

PILGRIM STATION

Docket No. 50-~~309~~ 293

REGULATORY PERFORMANCE HISTORY

A tabulation of significant milestones and enforcement actions

June 1972	Issued operating license.
December 1973	Shutdown Order issued to inspect for and repair fuel channel box damage.
December 1974	Fuel failure: Hydriding and pellet-clad interaction failures resulted in high gaseous activity. Operation with the fuel cladding perforations resulted in high dose rates in locations requiring access for operation and maintenance. During 1975, 76 and 77, power was limited between 60-80% to maintain offgas activity within regulatory requirements. The last of the defective fuel bundles was replaced during the 1977 refueling outage.
May 1975	A civil penalty ($12,000) was assessed for violations concerning Inservice Inspection activities identified during an inspection conducted December 1974 - February 1975.
July 1976	Management meeting to discuss concerns related to the management and implementation of the Health Physics Program.
October 1976	Management meeting to discuss concerns related to management and implementation of the Health Physics Program.
November 1977	Management meeting to review licensee efforts to strengthen Radiation Protection Program.
March 1978	A civil penalty ($16,000) was assessed for violations identified in inspection report 50-293/77-31. The violations were: overexposure of one individual; failure to instruct personnel in accordance with 10 CFR 19; failure to perform required air sampling; and failure to follow procedures.
September 1978	Management meeting to discuss concerns on recent inspection findings (all areas).
September 1979	Management meeting to discuss violation of primary containment integrity.
October 1979	A civil penalty ($5,000) was assessed for a violation identified in inspection report 50-293/79-15 involving a failure to follow the Security Plan.

February 1980	A civil penalty ($5,000) was assessed for shipping radioactive materials with external radiation levels in excess of regulatory limits.
March 1981 (SALP)	Management meeting to discuss the results of the SALP for the period January 1, 1980 to December 31, 1980.
April 1981	A civil penalty ($13,000) was assessed for events surrounding movement of irradiated fuel without secondary containment as identified in inspection report 50-293/80-03.
July 1981	A management meeting was held in July 1981 to discuss concerns for TMI Action Plan Items involving post accident sampling procedures and equipment and an Immediate Action Letter was issued regarding implementation of these items. Meeting was prompted by a June 1981 radiation protection inspection (50-293/81-14) found the licensee failed to conform with NRC criteria in connection with 4 of the 5 NUREG-0578 Category A items inspected.
June - September 1981	Inspections 50-293/81-18 and 81-22 identified six problems; inoperable combustible gas control system; failure to perform an adequate 50.59 review; failure to provide appropriate procedures and drawings; failure to make a report required by Technical Specifications; failure to provide accurate information to NRC; and failure to satisfy an Limiting Condition for Operation (LCO) regarding primary containment isolation valves. These inspections were subsequently the subject of enforcement actions taken in January 1982.
July - August 1981	A Performance Appraisal Inspection (50-293/81-20) found 6 of 8 areas examined below average. These were: committee activities; quality assurance audits; maintenance; corrective action systems; licensed and non-licensed training; and procurement. Plant operations and design changes and modifications were found to be average; however, significant weaknesses were identified in both areas.

October 1981	Enforcement conference to discuss management controls of safety related activities including the violations identified during inspections 50-293/81-18 and 81-22, the Performance Appraisal Inspection results, and an interim SALP review (period September 1, 1980 - August 31, 1981).
January 1982	Civil penalty ($550,000) assessed for failure to comply with requirements of 10 CFR 50.44; submittal of false information to NRC and subsequent delay of notification to NRC of known inaccurate information; and failure to comply with LCO for RCIC containment isolation valves.
(PIP)	Order modifying license required licensee to submit a comprehensive plan of action that would yield an independent appraisal of site and corporate management, recommendations for improvements in management controls and oversight, and a review of previous compliance with NRC requirements.
	Management meeting to discuss implementing requirements of the NOV/proposed civil penalty and order modifying license regarding the independent appraisal of Boston Edison Company (BECo) management practices.
January 1982	Inspection report 50-293/81-26 identified a severity level III violation for transportation of radioactive materials with liquid in the containers. This violation was based on an inspection in August 1981 by the State of South Carolina which resulted in issuance of a civil penalty ($1,000).
March 1982	Boston Edison Company (BECo) submitted the Performance Improvement Program (PIP) required by the January 1982 Order.
	NRC Management meetings to review status of the Performance Improvement Program were held approximately every six weeks until September 1984.

June 1982 --	A special inspection (50-293/82-20) conducted of licensee actions after radioactive spent resin was found on roof tops and pavement within the protected area. No violations identified. Confirmatory Action Letter issued concerning actions to be taken regarding the spent resin.
July 1982	Enforcement Conference to discuss exceeding an LCO associated with the Reactor Protection System water level instrumentation.
August 1982	Enforcement Conference to discuss exceeding an LCO associated with the Vacuum Breaker Alarm System.
September 1982 (SALP)	Management meeting to discuss the results of the SALP for the period September 1, 1981 to June 30, 1982.
August 1983	A shutdown order was issued requiring the licensee to shutdown in December 1983 and inspect the recirculation system piping for Intergranular Stress Corrosion Cracking. It required them to remain in cold shutdown until authorized to restart by the Director of NRR. The licensee replaced the recirculation system piping and was authorized to restart in December 1984.
September 1983 (SALP)	Management meeting to discuss the results of the SALP for the period July 1, 1982 to June 30, 1983.
November 1983	Management meeting to discuss refueling/pipe replacement preparations.
January 1984	Confirmatory Action Letter issued regarding licensee actions relative to health physics practices following the discovery of small, highly radioactive sources in the control rod drive repair room.
February 1984	Enforcement conference regarding the uncontrolled handling of small, highly radioactive sources in the control rod drive repair room.

April 1984	A civil penalty ($40,000) was assessed for problems in connection with the uncontrolled handling of small, highly radioactive sources in the control rod drive repair room between January 14 and 18, 1984. The violation involved identified problems with the labeling of containers, the use of extremity dosimetry, and the adequacy of instructions given to individuals working in the repair room.
September 1984	Management meeting to discuss a second instance of the uncontrolled presence of small, highly radioactive sources in the control rod drive repair room.
October 1984	Enforcement conference on the unplanned extremity exposure (within regulatory limits) connected with the small, highly radioactive sources in the control rod drive repair room. (Follow-up to September 1984 management meeting on same subject)
	Confirmatory Action Letter issued in connection with recurring radiation protection program weaknesses. The letter outlined licensee plans for evaluating and correcting these weaknesses.
November 1984	An order modifying the license was issued in connection with recurring weaknesses in the radiation protection program. The order required the licensee to complete an independent contractor assessment of the radiological controls program and to submit to NRC review and approval a Radiological Improvement Plan (RIP) for upgrading the radiological controls program. Followup inspections conducted in May, August, and November 1985 and April 1986.
	A Severity Level III violation (no civil penalty) was issued for failure to perform radiation surveys; failure to instruct workers in accordance with 10 CFR 19; and failure to properly implement a procedure in connection with the unplanned exposure noted above.
	Enforcement conference to discuss weaknesses in the control and monitoring of neutron instrumentation during refueling operations.

January 1985 (SALP)	Management meeting to discuss the results of the SALP for the period July 1, 1983 to September 30, 1984.
	Enforcement conference to discuss an unplanned occupational radiation exposure within regulatory limits associated with sludge-lancing operations on a waste tank as identified in inspection 50-293/84-44.
August 1985	Enforcement conference to discuss licensee's action on abnormal surveillance test results and a degraded vital area barrier.
October 1985	A civil penalty ($50,000) was assessed for the degradation of a vital area barrier.
November 1985	A safety system functional team inspection (50-293/85-30) was conducted by the Office of Inspection and Enforcement to assess the operational readiness and function of selected safety systems. The inspection identified that the licensee had not effectively mitigated a water hammer problem associated with the HPCI turbine exhaust line which had been occurring since the beginning of plant operation. Weaknesses were also identified with the licensee's design change process; control of plant instrumentation; handling of vendor information; program for approving and validating emergency operating procedures; capability to conduct a plant shutdown from outside the control room; and maintenance program for motor operated valves.
February 1986	Inspection report 50-293/86-04 identified a severity level III violation for failure to meet packaging requirements for low specific activity radioactive materials. This violation was based on an inspection in January 1986 by the State of South Carolina which resulted in issuance of a civil penalty ($1,000).

March 1986 (SALP)	Management meeting to discuss the results of the SALP for the period October 1, 1984 - October 31, 1985.
February - March 1986	A special diagnostic team inspection (50-293/86-06) was conducted to determine the underlying reasons for the licensee's poor performance described in the most recent SALP and to ascertain whether they could have an adverse impact on the safety of plant operations.
April 1986	An Augmented Inspection Team (AIT) conducted an inspection of recent operational events which included 1) the spurious group one primary containment isolations (and associated reactor scrams) that occurred on April 4 and 12, 1986, 2) the failure of the main steam isolation valves to promptly reopen after the containment isolations, and 3) the recurring pressurizations of the residual heat removal system. The AIT found the licensee's evaluations following the second event to be carefully structured and thorough. A Confirmatory Action Letter concerning the events was issued which required the licensee to provide a written report prior to restart containing the results of the evaluation and corrective actions. The CAL also required Regional Administrator authorization for restart.
	Inspection (50-293/86-10) reviewed implementation of the RIP. The inspection found the licensee adequately addressed 13 of the 34 items reviewed.
May 1986	Management meeting to discuss evaluations and corrective actions concerning the operational events of April 4 and 12, 1986.
June 1986	The first in a planned series of management meetings scheduled to review BECo management oversight of the implementation of the licensee improvement programs in progress.

Description of Improvement Program

I. Performance Improvement Program (PIP)

a) Required by Order in January 1982

b) Areas for Improvement
   1) Independent Review and Evaluation (MAC)
   2) Organization Review/Revision
   3) Management Control System Review/Revision
   4) Training on Changes

c) 126 milestones established

   - examples - Procedure Update Program (660 procedures)

   - Update Design Documents Program (450 drawings)

d) Status - Complete

   Licensee QA verification of final commitment performed October 1985

II. Radiological Improvement Program

a) Required by Order in November 1984

b) Areas for Improvement
   1) Independent Assessment of Program
   2) Radiological Organization Review/Revision
   3) Radiological Controls Review/Revision
   4) Management Oversight and Corrective Actions
   5) Training on Changes

c) 209 Milestones Established

   As of December 1985 one item remains open (reconfigure access control)

III. Continuous Improvement Program

a) Initiated by BECo in June 1985

b) Actions
   1) Visited plants with good SALP evaluations
   2) Conducted internal survey to identify problems/cause
   3) Issued report of findings in December 1985

c. Problem Areas Identified
1) Attitude
2) Accountability
3) Weak Root Cause Analysis
4) Communication
5) Effectiveness Assessment

d) Status
Implementation of sixteen of eighteen recommendations in progress

PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING
PILGRIM I NUCLEAR POWER STATION
SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW OF CONCERN

PILGRIM -I NUCLEAR POWER STATION

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PETITION FOR SHOW CAUSE CONCERNING

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

-- SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

-- PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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"Show-Cause" Petition

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SHOW CAUSE petition with the Nuclear Regulatory Commission concerning the Pilgrim nuclear plant in Plymouth, MA

The Show Cause petition will ask that the NRC suspend Pilgrim's license until Edison and the NRC can demonstrate that the following issues have been resolved. The areas are:

a. Mismanagement
b. Structural problems with containment
c. Radiological controls
d. Evacuation plans

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

-- PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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Affiliation:

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Signed: Susan C Tucker

Name:

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

SUBMITTED JULY 15, 1986

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PETITION FOR SHC. CAUSE CONCERNING

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

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PETITION FOR SHOW CAUSE CONCERNING

PILGRIM-I NUCLEAR POWER STATION

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