

EVALUATION

of

PILGRIM NUCLEAR POWER STATION

Boston Edison Company

August 1981

SUMMARY

INTRODUCTION

The Institute of Nuclear Power Operations (INPO) conducted its first evaluation of Boston Edison Company's Pilgrim Nuclear Power Station (PNPS) during the weeks of April 13 and 20, 1981. PNPS consists of a 655 megawatt (electrical) General Electric boiling water reactor plant. The station is located on Cape Cod Bay near Plymouth, Massachusetts. The unit was placed in commercial operation in December 1972.

PURPOSE AND SCOPE

INPO conducted an evaluation of site activities to make an overall determination of plant operating safety, to evaluate management systems and controls and to identify areas needing improvement. Information was assembled from discussions, interviews, observations and reviews of station documents.

The team examined station organization, training, operations, maintenance, radiological and chemistry activities, and on-site technical support. Emergency preparedness was not included in the scope of the evaluation, nor were corporate activities, except as an incidental part of the station evaluation. As a basis for the evaluation, INPO used its own experience on best practices within the industry and written evaluation criteria which were furnished to the plant in advance. The evaluation standards are high, and the findings and recommendations are not limited to minimum safety concerns.

DETERMINATION

Within the scope of this evaluation the team concluded the station is being operated and maintained in a safe manner by competent personnel. We noted a positive attitude among station and corporate management personnel toward improvements in station operation and management. The following beneficial practices and accomplishments were noted:

- o determined management planning and actions to improve conditions in such key areas as outage planning, housekeeping, marking and identification of systems, control of spare parts and warehousing, control of plant modifications, and individual accountability
- o an effective fire brigade training program
- o well-developed operating and emergency procedures in the areas of format, content, and usability
- o an aggressive ALARA program including pre-job planning
- o a minimal number of alarms in the control room.

Opportunities for improvement were identified as follows:

- o Formal programs should be established to ensure that tasks assigned to specific individuals are accomplished.
- o Management of the solid waste program should be improved to decrease the volume of waste produced.
- o There is inadequate work space for the health physics group, the instrument and control group, and the technical support group.
- o Controlled drawings should be updated in a timely manner. Some are not readable.
- o Operator training on the purpose, scope, and operational requirements of plant modifications should be provided before the system is restored to service.

Recommendations are intended to augment the Boston Edison Company's efforts to achieve high standards in its nuclear operations. In taking corrective action, the company should consider the underlying significance of findings and recommendations. Boston Edison Company's responses to the report are considered appropriate to the findings presented. To follow the completion of these responses, INPO requests written notification of status at six month intervals, until the next INPO evaluation.

Specific evaluation findings are in the accompanying Details, and information of an administrative nature is in the Administrative Appendix. These findings were presented at an exit meeting in Plymouth, Massachusetts, on April 24, 1981, and were further discussed along with the company responses on July 8, 1981, in a meeting with corporate and station management.

The cooperation received from all levels of the Boston Edison Company is appreciated.

E. P. Wilkinson
President

BOSTON EDISON COMPANY

Response Summary

The management of Boston Edison Company was not surprised by the conclusion of the INPO team that the station is being operated and maintained in a safe manner by competent personnel nor by the note that there is a positive attitude among station and corporate management personnel toward improvements in station operation and management. We were also pleased that the team took notice of a number of beneficial practices and accomplishments and that it did not identify any items that we had not previously noted for action.

One reason for this is that for a little more than three years we have had an oversight committee of outside experts reviewing our operations from a corporate point of view. This committee, known as the Nuclear Review Group, visits Pilgrim and our headquarters on about a quarterly basis. It has free access to personnel and documents and reports its findings with recommendations to top corporate management. It has made substantial contributions in this area of identifying items for improvement in the operation.

Our responses to the specific recommendations are attached in the format requested. Updates will be provided at six-month intervals. The first update will be submitted by February 1, 1982.

DETAILS

This portion of the report includes the detailed findings. It is composed of six sections, one for each of the major evaluation areas. Each section is headed by a summary describing the scope of the evaluation and the overall finding in that area. The summary is followed by the specific findings, recommendations and utility responses related to each of INPO's evaluation procedures. The evaluation procedures that were used are listed in the ADMINISTRATIVE APPENDIX.

ORGANIZATION AND ADMINISTRATION

Station objectives, organizational structures, administrative controls, industrial safety, programs for quality assurance, and surveillance inspections and tests were reviewed.

Several areas were evaluated that indicate strengths within the Pilgrim Station organization. A well-qualified support staff is available, a sound quality control program exists and comprehensive overall surveillance scheduling and computer-based outage planning programs are being developed.

Areas for improvement are as noted in the following performance areas:

OBJECTIVES

(INPO Procedure OA-101, Revision 1)

Evaluation was performed to determine how effectively goals and objectives are disseminated throughout all levels of the station and how effectively they convey intended operational and maintenance directives. Areas reviewed included the station mission statement, supervisor accountability, availability of station mission documents, assessment programs and measurement of goals and objectives attainment. Determinations were made as follows:

The criteria of OA-101 were met.

ORGANIZATION STRUCTURE

(INPO Procedure OA-102, Revision 2)

Evaluation was performed to determine how effectively the organization manages the station to ensure safe, efficient operation. Areas reviewed included applicability of the organizational structure diagram, position descriptions for all station personnel, personnel performance evaluation, supervisor's span of authority, assignment of backup personnel for each plant management position and individual work load assignments. Determinations were made as follows:

The criteria of OA-102 were met.

ADMINISTRATIVE CONTROLS

(INPO Procedure OA-103, Revision 1)

Evaluation was performed to determine the effectiveness of the controls for administrative functions. Areas reviewed addressed the program of administrative controls for purpose, scope, responsibility, flexibility, level of administrative actions and program dissemination. Determinations were made as follows:

Finding (Reference Criterion E)

No clearly defined methods are established to ensure responsibilities and accountabilities assigned by station procedures are performed.

Recommendation

Develop and implement programs or procedures that require periodic review for completion of those tasks assigned to individual positions or personnel classifications by station procedures.

Response

Boston Edison concurs with both the finding and recommendation and has recently formalized and computerized the Operations Review Committee Follow List addressing safety-related concerns. The Integrated Work Management System when implemented, in 1982, will address the remaining concerns.

QUALITY PROGRAMS

(INPO Procedure OA-104, Revision 4)

Evaluation was performed to determine how effectively quality programs monitor and audit plant activities to promote accomplishment of the station mission. Areas reviewed included management controls, accountability programs, program cross checks, program effectiveness, programs for corrective actions and manning. Determinations were made as follows:

Finding (Reference Criterion A)

Management controls are not in effect to require regular evaluation of some aspects of plant operations. Specifically, the areas not being evaluated include the following:

- o control room operations
- o plant chemistry and laboratory practices
- o security systems
- o procedures
- o safety, fire and emergency systems
- o effectiveness of the program for review of in-house and industry events.

Recommendation

Develop and implement periodic administrative or quality control review of the activities listed above to ensure quality performance in these areas.

Response

In addition to the existing scheduled audits of these areas by the Quality Assurance Department to meet the requirements of the station Technical Specifications and Section 18 of the Boston Edison Quality Assurance Manual, a surveillance inspection program will be implemented by the Operational Quality Assurance Group by March 1982. In addition, the Integrated Work Management System will also provide the management with an ongoing overview of the quality aspects of each task.

INDUSTRIAL SAFETY

(INPO Procedure OA-106, Revision 1)

Evaluation was performed to determine the effectiveness of the station's safety program in providing a safe, orderly working environment. Areas reviewed included the station's general and site-specific policy, management support for the safety program, and employee and management interface in safety matters. Determinations were made as follows:

1. **Finding** (Reference Criteria A, B, and C)

Commitment, support, and involvement in the safety program are not effectively achieved by management, the supervisory staff, or the employees. Specifically, safety meetings and plant fire drill exercises required by company procedures are not being performed.

Recommendation

Comply with the published instructions and policies of both the Boston Edison Company and the Pilgrim Nuclear Power Station (PNPS) regarding safety committees and meetings and general employee fire drill exercises, specifically:

- o Boston Edison Safety Manual (BESM) Safety Policy/Procedures (SP-2) - Safety Committees
- o PNPS Nuclear Operating Department Procedure 1.4.17 - Safety Committee and Meetings
- o BESM SP-3 - Fire Drill Exercise

Response

While the program is not formally documented, the incident ratio at PNPS indicates the safety consciousness of employees. A policy statement will be issued and procedures revised to ensure compliance. This effort will be completed by September 1981.

2. **Finding** (Reference Criterion D)

Plant-specific work practices and safety considerations that affect employee safety are not always published and made available to every employee.

Recommendation

Comply with the requirements of the Boston Edison Safety Manual regarding new employee safety training and job safety standards. Specifically, ensure each new employee is given a copy of the accident

prevention manual and ensure compliance with the requirements of BESM SP-6 (Job Safety Standards).

Response

Boston Edison agrees that an accident prevention manual should be distributed or made available to all employees and Boston Edison will review the existing manual and reorder for distribution. This action will be completed prior to September 1981.

3. Finding (General Criterion)

Industrial safety responsibility is a collateral duty of the Senior Nuclear Training Specialist. The demands of his primary duties do not permit him to devote the attention necessary to effectively administer the industrial safety program.

Recommendation

Reassign responsibility for the industrial safety program to an individual trained in the subject and available to give it the necessary attention.

Response

Boston Edison agrees that the duties of the Industrial Safety Officer have evolved into a full-time requirement in view of the increasing modifications activity. A position description is being developed and a target date of September 1981 has been established for filling the position.

SURVEILLANCE PROGRAM

(INPO Procedure OA-107, Revision 1)

Evaluation was performed to determine if an effective program exists to accomplish surveillance inspection and testing. Areas reviewed in the surveillance program included completeness, depth, acceptance criteria, results review, notification and control of off-standard conditions, suitable scheduling and training in proper use of surveillance procedures. Determinations were made as follows:

The criteria of OA-107 were met.

PERSONNEL QUALIFICATIONS

(INPO Procedure OA-108, Revision 1)

Evaluation was performed to determine if a program exists for providing qualified personnel to operate and maintain the station. Areas reviewed included the applicability of job descriptions for station positions, the programs for personnel promotion and selection, and the program for periodic review of all job descriptions. Determinations were made as follows:

The criteria of OA-108 were met.

TRAINING AND QUALIFICATIONS

The following areas were evaluated: training organization and administration, training programs for licensed and non-licensed operators, shift technical advisors and other station personnel, training resources, and training program effectiveness. There were positive features noted in most areas. Of special note were the conscientious and capable training staff, management's support of training activities, and the structured annual oral examination administered to all licensed personnel. Improvements can be made in the areas discussed in detail below.

TRAINING ORGANIZATION AND ADMINISTRATION

(INPO Procedure TQ-211, Revision 2)

Evaluation was performed to ensure that the station has a clearly defined training organization that provides for assignment of responsibilities and delegates authority to accomplish those tasks assigned to the training group. Areas reviewed included the organizational structure and practices, training staff size, ability and authority to schedule and provide required training, and the existence of and adherence to written training plans.

1. Finding (Reference Criterion A)

A formal organizational structure which agrees with actual reporting requirements has not been published.

Recommendation

Develop and publish an organizational structure that describes the functional and administrative relationships within the training group.

Response

The Training Manager's position, which was under development during the assessment, has been approved and candidates are being solicited. To avoid confusion during the development, the anticipated organization change was not published. It will now be made formal prior to July 1, 1981.

2. Finding (Reference Criterion D)

Training programs, as described in the training manual, have not been effectively implemented in the following areas:

- o operations group training
- o maintenance group training
- o technical group training.

A new training plan for licensed operator training has been developed and is being implemented. The training manual has not been revised to reflect the new training plan.

Recommendation

Identify the training programs and records described in the Training Manual that are not being implemented. Review these programs for applicability. This review should include, but not be limited to, weaknesses noted in TQ-243, Criterion A; TQ-244, Criterion E; and TS-701, Criterion D. Implement the training programs that result from this review.

Response

Boston Edison agrees with the recommendation. The Training Manual will be reviewed to determine applicability of non-implemented training programs and records. Those programs and records identified as applicable will be implemented by May 1, 1982.

TRAINING RESOURCES

(INPO Procedure TQ-221, Revision 2)

Evaluation was performed to determine whether sufficient and adequate facilities, equipment, and materials are provided to support the training programs. Areas reviewed included facilities, laboratories, workshops, office space, training materials, aids and equipment, lesson development, and accommodations to support the trainers and trainees. Determinations were made as follows:

Finding (Reference Criterion F)

Lesson plans, reference materials and training aids do not exist for the complete implementation of the licensed operator training, licensed operator requalification training, and shift technical advisor training programs. A plan to produce these materials on an "as needed" schedule is being implemented.

Recommendation

Prepare the required training program materials in sufficient time to allow for review and practice use. In developing these training materials consider similar weaknesses in TQ-243, Criterion C; TQ-244, Criterion B; and TQ-245, Criterion D. Management should establish goals and priorities to ensure that necessary materials are developed, reviewed and made available for use in all scheduled training sessions.

Response

Boston Edison agrees with the recommendation and will complete all actions by May 1, 1982.

TRAINING EFFECTIVENESS

(INPO Procedure TQ-231, Revision 2)

Evaluation was performed to determine what measurements are made of the effectiveness of training programs in meeting training objectives and improving operational performance. Areas evaluated included programs for management evaluation of training effectiveness, measurement of trainee and instructor performance, and audits of training activities. Determinations were made as follows:

The criteria of TQ-231 were met.

NON-LICENSED OPERATOR TRAINING

(INPO Procedure TQ-242, Revision 2)

Evaluation was performed to determine whether a training program has been established for non-licensed operators. Areas reviewed included the programs for initial and continued training of non-licensed operators who are not scheduled to become licensed operators. In addition, programs for initial training of non-licensed operators scheduled for eventual licensing were reviewed. Determinations were made as follows:

1. Finding (Reference Criterion A)

An initial training program for non-licensed Nuclear Plant Operators has not been developed. The on-the-job training provided to prepare operators to become "tour-qualified" is unstructured and not effectively implemented.

Recommendation

Develop and implement a training program that will prepare the non-licensed Nuclear Plant Operators for their assignments.

NOTE: "INPO Guidelines for Qualification Programs for Nuclear Power Plant Non-licensed Operators" (Document Number GPG-04) could provide a basis for the development of this program. Modifications of the INPO guidelines could be made to correctly address the duties and responsibilities of Pilgrim's "tour-qualified" watch stander during normal, off-normal or emergency operations.

Response

The course outline has been developed and is presently being implemented by the Training Department for the present class of non-licensed operators.

2. Finding (Reference Criterion C)

The training program for Nuclear Auxiliary Operators is not fully implemented.

Recommendation

Implement a structured training program that includes appropriate fundamentals and system checkouts for Nuclear Auxiliary Operators.

NOTE: INPO guidelines referenced above address the development of this program.

Response

Boston Edison agrees and a course outline has been developed and materials are being prepared to implement the program. This program is scheduled to commence July 1, 1981.

LICENSED OPERATOR TRAINING

(INPO Procedure TQ-243, Revision 2)

Evaluation was performed to determine the effectiveness of the training program that prepares candidates for reactor operator and senior reactor operator (SRO) licenses. Areas reviewed included program content; base level of knowledge; training materials and source inputs; training in systems, plant fundamentals and operating practices; SRO training; and evaluation of trainees and the training program. Determinations were made as follows:

Finding (Reference Criterion I)

A program of technical, supervisory, and administrative training to address the increased responsibilities of senior reactor operators has not been developed.

Recommendation

Develop and implement a training program for senior reactor operators that addresses their increased duties and responsibilities.

NOTE: "INPO Guidelines For Qualification Programs at Operational Units for Nuclear Power Plant Licensed Operators" (Document Number GPG-03) could provide a basis for this program.

Response

Boston Edison agrees with the recommendation and the program will be developed and should commence during the next requalification training cycle.

LICENSED OPERATOR REQUALIFICATION PROGRAM

(INPO Procedure TQ-244, Revision 2)

Evaluation was performed to determine the effectiveness of the requalification program in maintaining a high level of skill and knowledge for each Reactor Operator and Senior Reactor Operator. Areas reviewed included development and use of training materials to upgrade licensed operators in fundamentals and to inform them of procedure changes, licensee event reports, plant modifications, changes in station license requirements and changes in vendor information affecting operations. In addition, the policy on use of a training simulator, periodic program evaluation and provisions for inactive operator identification and requalification were reviewed. Determinations were made as follows:

Finding (General Criterion)

A system to prevent the potential compromise of the annual written examination has not been implemented. The same examination is given five separate times, once to each operating shift.

Recommendation

Implement a system to reduce the probability of the compromise of the annual examination.

Response

Boston Edison does not believe the examination content is being compromised. However, a system using multiple examinations, variations of the same question or variation of question types will be implemented to

reduce the probability of potential compromise of the annual written examination. The anticipated date for initiating this examination policy is January 1, 1982.

SHIFT TECHNICAL ADVISOR TRAINING

(INPO Procedure TQ-245, Revision 1)

Evaluation was performed to determine if a suitable training policy has been developed and implemented for shift technical advisor (STA) training and education. Areas of interest included a review of the STA program for college-level and site-specific instruction, simulator training, retraining provisions, and documentation of all training. Determinations were made as follows:

The criteria of TQ-245 were met except as noted in TQ-221, Criterion F in regard to requalification training.

OPERATIONS

Organization and administration, conduct of shift operations, tagout practices, use and content of procedures, plant status controls, facilities and equipment, and shift turnover were reviewed. Several good practices were noted, including well developed operating and emergency procedures, a dedicated control room paging system, and the availability of alarm response procedures at each control panel.

Improvements could be made in the areas of tagout practices, conduct of shift operations, plant status controls, and shift turnover. These improvements are discussed in detail below.

ORGANIZATION AND ADMINISTRATION

(INPO Procedure OP-301, Revision 3)

Evaluation was performed to determine the existence of a clearly defined operations organization that provides for the assignment of responsibility and delegation of adequate authority for accomplishment of required tasks. Areas reviewed included organizational structure, job descriptions, shift administrative assignments, written and oral instructions and orders, and miscellaneous administrative programs. Determinations were made as follows:

The criteria of OP-301 were met.

TAGOUT PRACTICES

(INPO Procedure OP-302, Revision 2)

Evaluation was performed to determine if established tagout practices ensure protection for personnel and station equipment. Areas reviewed included senior reactor operator approval of safety-related tagouts, double verification of tagged equipment for personnel safety, double verification of important safety-related components, tag coloring and numbering, and clearance log review. Determinations were made as follows:

1. Finding (Reference Criterion C)

A second verification is not performed for safety-related components and critical balance-of-plant equipment that are repositioned during maintenance, testing or change in operating mode. Use of OPER-38, Shift Turnover Sheet, as verification of system status, does not meet the intent of this criterion.

Recommendation

Develop and implement a station policy of second verification for safety-related components and critical balance-of-plant equipment that do not have control room position indication. Modify existing procedures as necessary to define the systems and plant conditions requiring independent verification.

Response

This recommendation was being evaluated at the time of the INPC assessment as part of the TMI issues. The requirements for second verification have been developed and will be implemented by August 1, 1981.

2. Finding (Reference Criterion G)

Although audits of active clearances placed for the watch engineer are done, audits of active clearances covered by maintenance requests are not being performed.

Recommendation

Implement periodic audits of clearances covered by active maintenance requests similar to the audits currently in use for red tags issued by the watch engineer. These audits should include a check for adequacy of the tagouts, verification that tags are in place and equipment properly positioned, and status of the equipment or system covered by the tagout. Results should be reviewed by appropriate supervisors within the operations group.

Response

This recommendation is incorporated in the Integrated Work Management System and although not scheduled to be implemented until after the 1981 refueling outage, this particular portion will be implemented prior to startup.

CONDUCT OF SHIFT OPERATIONS

(INPO Procedure OP-303, Revision 3)

Evaluation of the conduct of shift operations was performed to determine if operator activities and the aids for these activities support safe and efficient operation of the station. Areas reviewed included observation of operations, station cleanliness and order, response to abnormal conditions, logkeeping practices, reliability of control room instrumentation, and operator awareness of plant conditions. Determinations were made as follows:

The criteria of OP-303 were met except as noted in TS-703, Criterion C and TS-704, Criterion I.

USE OF PROCEDURES

(INPO Procedure OP-304, Revision 2)

Evaluation was performed to determine if procedure content and use are appropriate for conducting operations safely and reliably. Areas reviewed

included management policies for use of procedures and changes to procedures (short and long term). In addition, procedures were reviewed for clarity, continuity, identification of "sequence required" actions, and suitable advisory information. Determinations were made as follows:

The criteria of OP-304 were met.

PLANT STATUS CONTROLS

(INPO Procedure OP-305, Revision 2)

Evaluation was performed to determine if plant status controls are provided to ensure adequate equipment and system availability. Areas reviewed included management programs and policies that provide guidance for status control, actual practices in status control, responsibilities of senior licensed operators assigned to monitor and review status control, and provisions for status control under special conditions (e.g., outages, accident recovery or refueling). Determinations were made as follows:

Finding (Reference Criterion A)

A policy statement that includes several elements of status control was recently formalized. However, it does not cover many elements necessary to ensure that all affected watch stations are kept current.

Recommendation

According to the policy statement, it is understood that the associated guidelines will be formally incorporated into procedures by July 1981. The new procedures should be expanded to include the following:

- o equipment checksheets, status boards or other means to define requirements for each mode or plant condition
- o documentation at each affected shift level when status changes
- o formal assignment of an SRO for status change review and control
- o timely communication of status changes to all affected shift levels
- o periodic status monitoring and evaluation by management
- o provisions for status control during special situations, such as extended outages, refueling and post-accident recovery.

Response

The recommendations have been incorporated and will be in place by July 1, 1981.

OPERATIONS FACILITIES AND EQUIPMENT

(INPO Procedure OP-306, Revision 2)

Evaluation was performed to determine if plant facilities and equipment are operated and maintained in a manner that ensures safe and efficient operation. Areas reviewed included equipment service needs, effect of the working environment on safe and efficient station operation, and adequacy of communications equipment. Determinations were made as follows:

The criteria of OP-306 were met.

SHIFT TURNOVER

(INPO Procedure OP-307, Revision 1)

Evaluation was performed to determine if continuous, correct understanding of station conditions is maintained at all shift positions. Areas reviewed included programs and policies controlling shift turnover practices for individual shift positions, checklists, operating panel reviews and review of station activities in progress or planned. Determinations were made as follows:

Finding (Reference Criterion B)

Some operating shift positions do not have specific checksheets, or a similar mechanism, to guide the turnover process. A common check-sheet exists for several shift positions, but is limited in scope and does not include many items.

Recommendation

Develop turnover checksheets, or similar mechanism, to guide the turnover process for the Watch Engineers, Nuclear Auxiliary Operators and Nuclear Plant Operators (tour men). Broaden the scope of the check-sheets currently used by the Nuclear Operations Supervisors and Nuclear Plant Operators (control room operator). These shift turnover systems should include, but not be limited to, information pertinent to the watch station such as balance-of-plant equipment, jumper log review, testing in progress, and equipment out-of-service; and should provide a method for ensuring that plant status is understood.

Response

Boston Edison has begun to incorporate these parameters and will have the revision in place by September 1981.

MAINTENANCE

Organization, corrective and preventive maintenance, administrative programs procedures, maintenance history, special processes, and maintenance facilities were reviewed.

The knowledge and experience of group personnel are a strength to the maintenance and instrument and control (I & C) organizations. Additionally, there is a progressive approach by management which should contribute to performance of the maintenance function.

Areas where improvements are recommended included preventive maintenance, maintenance procedures, maintenance history, control of test equipment, and maintenance facilities.

MAINTENANCE ORGANIZATION AND ADMINISTRATION

(INPO Procedure MA-401, Revision 2)

Evaluation was performed to determine how effectively the maintenance and I & C organizations and administrative programs function to enhance performance of maintenance tasks. Areas reviewed included organizational structure, reporting requirements and practices, staff size, training and retraining, use of position descriptions and span of control for supervisors. Determinations were made as follows:

The criteria of MA-401 were met.

PREVENTIVE MAINTENANCE

(INPO Procedure MA-402, Revision 1)

Evaluation was performed to determine the effectiveness of the maintenance effort in optimizing equipment reliability and performance. Areas of review included governing procedures, equipment included in the program, type and frequency of preventive maintenance (PM), and effectiveness of program coordination and control. Determinations were made as follows:

Finding (Reference Criteria A,B,D,E, and G)

Although some preventive maintenance activities are performed by various groups at the plant, a formal, comprehensive preventive maintenance program is needed.

Recommendation

Develop and implement a formal, management-approved preventive maintenance program for mechanical, electrical, and I & C equipment. The program should include the following:

- o specific criteria for determining what equipment and instrumentation will be included

- o assignment of responsibilities for program development, implementation, and review
- o development of individual preventive maintenance procedures for safety-related equipment and instrumentation, and inspection guidelines for other equipment and instruments
- o establishment of realistic inspection or maintenance frequencies and appropriate types of PM activities.

Response

A plan and schedule to develop a program encompassing but not limited to the above recommendations is presently being developed. Implementation of the plan is scheduled to commence in September 1981.

MAINTENANCE PROCEDURES

(INPO Procedure MA-403, Revision 2)

Evaluation was performed to determine if existing maintenance procedures provide for quality and effectiveness of maintenance activities. Areas of review included an assessment of activities governed by procedures, methods of procedure development and revision, and content of procedures. Determinations were made as follows:

Finding (Reference Criterion A)

Vendor instruction manuals used extensively for control of work on safety-related and important non-safety-related equipment are not formally reviewed and approved.

Recommendation

Prior to use in safety-related or important non-safety-related work, vendor instruction manuals should be reviewed and approved in a manner equivalent to that provided for plant procedures. This review should consider applicability of the manual to the work to be performed, accuracy and suitability for controlling work, and established quality check points.

Response

The Integrated Work Control System, utilizing the Erection Control Sheet concept, will implement the above recommendations by requiring an Operations Review Committee review of processes required by vendor manuals not previously reviewed. These reviews will be required by September 1, 1982.

WORK CONTROL SYSTEM

(INPO Procedure MA-404, Revision 1)

Evaluation was performed to determine the effectiveness of the work control system in use at the plant. The system functions were checked to see if they define and authorize work to be performed by maintenance groups; provide for planning, scheduling and control of actual work; and provide a suitable record of work performed for future reference. Determinations were made as follows:

The criteria of MA-404 were met.

MAINTENANCE HISTORY

(INPO Procedure MA-405, Revision 2)

Evaluation was performed to determine if maintenance history records are retained and used to improve equipment reliability and performance. Areas of review included assessment of equipment included in the program, content and accessibility of records, history review and evaluation methods, and procedures for program implementation. Determinations were made as follows:

Finding (Reference Criterion D)

Mechanical, electrical and I & C maintenance history records are maintained but are not reviewed on a systematic basis. Equipment failures and "as found" out-of-specification instrumentation are not routinely evaluated. The potential necessity for more frequent preventive maintenance or calibration is not being recognized.

Recommendation

A program should be instituted for the systematic review of maintenance history records. Reviews should be used to identify equipment performance trends, adjust preventive maintenance frequency, and improve equipment reliability.

Response

This recommendation has been incorporated as a requirement of the Preventive Maintenance Program.

CONTROL AND CALIBRATION OF TEST EQUIPMENT AND INSTRUMENTATION

(INPO Procedure MA-406, Revision 1)

Evaluation was performed to ensure that available facilities and procedures provide for accurate test equipment and instrumentation. Areas reviewed included identification, calibration, storage, issuance, usage, shipment and documentation. Determinations were made as follows:

Finding (Reference Criterion F)

Measuring and test equipment that is damaged or for which the calibration has expired is stored in the same location as operable, ready-for-issue equipment. Lack of segregated storage could lead to inadvertent use of inaccurate equipment.

Recommendation

Damaged or uncalibrated measuring and test equipment should be separated from equipment that is ready for issue.

Response

This recommendation is currently being implemented.

CONTROL OF SPECIAL PROCESSES

(INPO Procedure MA-407, Revision 1)

Evaluation was performed to determine if adequate controls exist for performance of special processes. Areas of review included training and qualification of personnel, administrative controls, and control of equipment and materials. Determinations were made as follows:

The criteria of MA-407 were met.

MAINTENANCE FACILITIES AND EQUIPMENT

(INPO Procedure MA-408, Revision 1)

Evaluation was performed to determine if available facilities and equipment contribute to the performance of maintenance activities. Areas reviewed included number, type and condition of tools and equipment; size and location of tool storage areas; adequacy of office and work areas; and the cleanliness and orderliness of maintenance facilities. Determinations were made as follows:

1. Finding (General Criterion)

Spare parts for I & C work are not readily available. Recent efforts to relocate all I & C spare parts under control of the central warehouse system has contributed to this problem.

Recommendation

Review existing spare parts support and take action to improve availability of I & C spare parts. The following actions should be considered:

- o expediting inventory of spare parts and assignment of Boston Edison Company stock numbers
- o issuing updated computer printouts of spare parts inventory on a more frequent basis
- o developing cross-reference information for locating identical parts in different plant systems.

Response

Boston Edison believes that the recent relocation of I&C spare parts to the warehouse caused this finding. The first two items are being expedited while the capability to implement the third is in place.

2. **Finding (Reference Criterion B)**

Adequate tool storage is not available at suitable areas in the plant.

Recommendation

Continue with present plans to stock and man tool issue stations within the plant.

Response

This effort is being supported and should be in place by September 1981.

3. **Finding (Reference Criterion C)**

I & C office and work areas do not adequately conform to the needs of the organization. Normal access to the control room through the I & C shop disrupts work and may be a safety hazard for technicians due to crowded conditions. Office space for the I & C supervisor is inadequate and hinders effective work.

Recommendation

An alternate means of access to the control room should be established and utilized to prevent disruption of activities in the I & C shop. Arrangement of the shop should also be reviewed and adjusted to provide suitable office space and areas for storing and using prints.

Response

The planned administrative building expansion should vacate offices in the plant and allow for relocation of some of the facility. In the meantime, a temporary trailer facility has been established.

RADIATION PROTECTION AND CHEMISTRY

Organization, administration, radiological protection, radioactive waste management and process water chemistry were reviewed. This portion of the evaluation was primarily an examination of plant programs and facilities as they function under normal operating conditions. It was concluded that the station's radiation protection and chemistry programs are being conducted in a manner that provides for sufficient controls to protect the public, plant workers and the environment.

A number of strengths were noted, including an aggressive, management-supported ALARA program, well-organized contamination control points and the active pursuit of program and facility improvements by station health physics and chemistry personnel. However, improvements could be made in the management of solid radioactive wastes, the adequacy and efficiency of facilities and the methods used for calibration and testing of radiological protection instrumentation as discussed below.

RADIATION PROTECTION AND CHEMISTRY ORGANIZATION AND ADMINISTRATION

(INPO Procedure RC-501, Revision 1)

Evaluation was performed to determine the effectiveness of the radiation protection and chemistry organizations and associated administrative control mechanisms in providing the level of services required at the station under normal operating conditions. Areas reviewed included the formal organizational structure, procedures for conduct of operations, staffing levels, training and retraining programs, position descriptions, and management authority. The radiation protection and chemistry groups are organized and administered in an effective manner. Both organizations are taking steps to increase technician staffing to support increased workload and, in the case of radiation protection, to reduce the reliance upon contractor personnel. Planning for future needs appears adequate, and the staff is aggressively pursuing improvements in existing programs. Determinations were made as follows:

The criteria of RC-501 were met.

ALARA PROGRAM

(INPO Procedure RC-502, Revision 1)

Evaluation was performed to determine the effectiveness of efforts toward maintaining personnel occupational radiation exposure as low as is reasonably achievable (ALARA) at the station. Areas of interest included the company's ALARA policy, responsibilities for ALARA, level of review for the ALARA program, systems for setting ALARA goals and measuring progress, and the overall scope of ALARA activities.

A formal ALARA program is in place at the station and is managed on a day-to-day basis by a dedicated ALARA group consisting of two ALARA engineers and one ALARA technician. A well documented, effective decision-making system is in use to perform cost-benefits analyses on ALARA efforts for major tasks as a part of pre-job evaluation and planning. The ALARA group is effectively pre-planning all radiological work on a task basis; however, improvements are possible for job tracking and trend analysis. Determinations were made as follows:

Finding (Reference Criterion D)

The ALARA program does not include a system for establishing specific exposure goals for major tasks or a method for tracking exposure accumulation on such tasks to monitor progress against the goals.

Recommendation

Expand the existing ALARA program to include a system for establishing exposure goals and monitoring exposure during major tasks. The exposure goals and tracking system should also include provisions for evaluation and corrective action, when necessary, for exposure accumulation in excess of the goals.

Response

This aspect of the ALARA program is being developed and will be implemented during the 1981 refueling outage.

PERSONNEL DOSIMETRY

(INPO Procedure RC-503, Revision 1)

Evaluation was performed to determine the effectiveness of the station's dosimetry program in measuring, evaluating and recording occupational radiation exposures. Areas examined included the scope of the dosimetry program, procedural controls, dosimetry selection and use, system operation, and exposure records.

The station's external dosimetry program is efficiently organized and tightly controlled. Clerical support is used effectively to minimize the paperwork burden on technicians and supervisors and to make the system easy to use from the perspective of station radiation workers. Exposure accumulation reports are being provided to plant personnel and supervisors on a daily basis. The dosimetry records group is in the process of converting paper exposure records files to a microfiche system with duplicate off-site storage for permanent records. Determinations were made as follows:

The criteria of RC-503 were met.

RADIATION SURVEILLANCE AND CONTROL

(INPO Procedure RC-504, Revision 1)

Evaluation was performed to determine the effectiveness of the station's radiological surveillance program and radiological work and material control mechanisms in identifying radiological conditions to workers and management. Areas of interest included surveillance program procedures, surveillance program scope, radiological conditions in the plant, surveillance methodology, management reviews, work and access controls and solid radioactive waste management. Determinations were made as follows:

Finding (General Criterion)

The station is not as effective as possible in minimizing the amounts of solid radioactive waste generated and the volume of waste shipped offsite, specifically:

- o No pre-collection or post-collection segregation or sorting of compactable waste is performed.
- o Unnecessary non-radioactive waste materials are not effectively restricted from entry into radiological controlled areas.
- o The waste compacting method in use is inferior to that used at other nuclear stations, resulting in lower than normal densities for compacted radioactive waste shipments.

Recommendation

Develop and implement a program to reduce the amount and volume of compacted radioactive waste. Further, include information and techniques in station training programs, such as General Employee Training, to increase station personnel awareness of the problem.

Items which should be considered include, but are not limited to, the following:

- o provision of clean waste receptacles in radiological controlled areas and at the entrances to these areas
- o removal of all packing materials and protective covering from items before they enter a radiological controlled area
- o post-collection sorting of non-contaminated materials.

Additionally, the station should expedite placing in service the high density drum compactor recently purchased.

Response

A program to minimize the generation of potential radioactive waste has been initiated, and installation of the high density drum compactor is anticipated to be completed prior to the refueling outage. General Employee Training programs will include information for the control of potential radioactive waste.

WASTE AND DISCHARGE CONTROL (Liquid)
(INPO Procedure RC-505, Revision 2)

Evaluation was performed to determine the effectiveness of the station's liquid waste control programs in minimizing the generation of liquid radioactive waste and limiting releases to levels as low as is reasonably achievable. The program elements reviewed included procedures, effluent monitoring system design and function, clean systems sampling, and training. The station is effectively controlling the generation, processing and release of liquid radioactive waste. Determinations were made as follows:

The criteria of RC-505 were met.

RADIOLOGICAL SURVEY EQUIPMENT CONTROL AND CALIBRATION
(INPO Procedure RC-506, Revision 2)

Evaluation was performed to determine the effectiveness of the station's radiological survey equipment control and calibration program in maintaining a sufficient inventory of instruments and a high degree of accuracy for the radiological measurements made with these instruments. The evaluation covered procedures, storage conditions, reference standard traceability, operational response checks, and calibration methods. Determinations were made as follows:

Finding (General Criterion)

The methods employed for calibration and operational response testing of radiation protection instruments are not adequate to ensure that the instruments will perform accurately over their full useful ranges. Survey instruments and rate meters are calibrated at only one point within the effective range of each calibration control and are not checked for linearity at additional points on each scale or decade of readout. Pancake GM probes used on friskers are not efficiency-checked, and friskers are source-checked with radioactive standards which do not represent radioactivity levels near the station's contamination limit. Survey instruments are not source-checked prior to use or on a routine schedule.

Recommendation

The methods and procedures employed for calibration of portable radiation protection instruments should be revised to incorporate the guidance given in Sections 4.1 and 4.2.2 of ANSI N323-1978, "Radiation Protection Instrumentation Test and Calibration." As a part of calibration, each frisker equipped with a pancake GM probe should be efficiency-checked with an appropriate radioactive standard. In addition, all replacement probes should be similarly checked immediately after installation on a calibrated frisker. Source checks performed on friskers should utilize a planchet source with activity levels at or near the plant's surface contamination limit.

Instrument operational response checks should be performed prior to use of instruments or on a routine schedule. The response checks should include quantitative performance tests such as those described in Section

4.6 of ANSI N323, except that checking each scale or decade of readout should be based on the availability of sources, planned instrument use and consideration of ALARA principles. Instruments should be checked on those ranges which are of the most importance to the user.

Response

Procedures are being changed to reflect linearity response during calibration. A program for efficiency response determination of pancake probes will be implemented. Source checks performed on friskers will include use of a source with activity levels at or near the station's surface contamination limit. Quantitative performance checks will be performed based on planned instrument use and consideration of ALARA principles. This effort should be completed by September 1, 1981.

PERSONNEL HEALTH PHYSICS INDOCTRINATION

(INPO Procedure RC-507, Revision 2)

Evaluation was performed to determine the effectiveness of the station's health physics indoctrination program in informing personnel of the risks associated with radiation exposure and the available methods for minimizing exposure. Areas reviewed included management policy, scope and depth of the indoctrination, the training environment, and training documentation.

The health physics indoctrination program is presented as a part of general employee training and consists of videotape presentations supported by live instruction. Overall, the indoctrination program is structured and conducted in a manner that achieves the objective of preparing personnel to work in radiological controlled areas. Determinations were made as follows:

The criteria of RC-507 were met.

PROCESS WATER CONTROLS

(INPO Procedure RC-508, Revision 2)

Evaluation was performed to determine the effectiveness of process water controls in maintaining the integrity of plant systems. Areas reviewed included procedures; laboratory quality control; bulk chemical, cleaning agent and reagent control; training; and systems chemistry. The station's chemistry control program is well managed and appears effective in minimizing corrosion. Determinations were made as follows:

The criteria of RC-508 were met.

HEALTH PHYSICS FACILITIES AND EQUIPMENT

(INPO Procedure RC-509, Revision 2)

Evaluation was performed to determine the effectiveness of the station's health physics and chemistry facilities and equipment in satisfying station needs and in contributing to safe and efficient plant operation. Areas of interest included the number and types of instruments and equipment, the protective clothing inventory, the design and working environment of facilities and the ease of access to and physical conditions of radiological controlled areas. The radiological condition and cleanliness of controlled areas were good. Contamination control points were well organized to enhance the ease of access and egress for workers to and from contaminated areas. Determinations were made as follows:

Finding (Reference Criterion C)

An inadequacy exists in the design and working environment of some health physics and chemistry facilities, specifically:

- o The health physics and chemistry counting rooms lack adequate air conditioning to support the computer-based counting equipment in these spaces.
- o Respirator cleaning, monitoring, storage, and issue facilities are widely separated, contributing significantly to problems in conducting a respiratory program, particularly during outages.
- o The health physics instrument calibration facility and instrument ready room are overcrowded and inadequately equipped for instrument storage.
- o Background radiation levels in the whole body counting facility are variable, and at times are too high for optimum operation of the in-vivo counting equipment.

Recommendation

Upgrade the ventilation supply and air conditioning equipment as necessary to ensure adequate temperature control of the counting rooms.

In addition, pursue the completion of the planned modifications of available space to accommodate the respirator handling facilities and the instrumentation calibration and storage spaces. Consideration should be given to a similar weakness that exists in RC-506, Criterion B. Further, pursue the station plan for relocating the whole body counting facility.

Note: At the time of the evaluation, the station had purchased additional in-vivo counting equipment and is planning to move the whole body counting facility to a building outside of the protected area where background is expected to be lower and more stable. The move and the installation of the improved equipment should improve the counting performance of the facility.

Response

Modification to the heating, ventilation and air conditioning equipment for the health physics and chemistry counting rooms will be performed

expeditiously. Facility modifications for respirator handling and instrument calibration are being pursued and should be in place by September 1, 1981. Relocation of the whole body counting equipment to an area outside the restricted area is continuing as planned.

RESPIRATORY PROTECTION PROGRAM

(INPO Procedure RC-511, Revision 2)

Evaluation was performed to determine the effectiveness of the station's respiratory protection program in protecting personnel from inhalation of particulate matter, noxious gases and vapors, and from oxygen deficiency. Areas reviewed included policy and procedures, identification and control of airborne materials, selection and use of respirators, respirator maintenance and emergency capabilities.

The station is in the process of developing and implementing a comprehensive respiratory protection program. As an interim measure, respiratory protection equipment is being used wherever warranted by conditions, but credit is not being taken for protection factors when calculating MPC-hrs of exposure to airborne radioactivity. Both the existing program and the draft plans for the new respiratory protection program were reviewed during the evaluation. Determinations were made as follows:

Finding (Reference Criterion B)

The station does not have a formal program in effect to control entry to and work in confined spaces. Additionally, systems that supply breathing air for use in supplied-air respirators are not sampled to verify the air meets breathing air quality specifications.

Note: It is recognized that the station plans to incorporate breathing air quality sampling in the new respiratory protection program.

Recommendation

Develop and implement a program for entry into confined spaces. The program should include identification of confined spaces, pre-entry testing, ventilation, respiratory protection, worker safety and routine monitoring of occupied spaces.

Service air systems should be sampled prior to use as breathing air and periodically thereafter. The output of the self-contained breathing apparatus bottle charging station should be sampled as an item of routine maintenance.

Response

Implementation of the respiratory protection program will include both confined space and breathing air quality sampling and is scheduled for completion by September 1981.

TECHNICAL SUPPORT

On-site engineering support was evaluated in the areas of organization and administration, engineering functions performed, nuclear operating experience evaluation, plant modifications, and reactor engineering.

A good effort is being made by the Technical Group to implement plant management goals through specific tasks assigned in the areas of reactor engineering, I&C engineering, and chemistry. The document control system being implemented by the on-site Information Resources Management Group is comprehensive and well organized. Improvements can be made in the following performance areas:

TECHNICAL SUPPORT ORGANIZATION AND ADMINISTRATION

(INPO Procedure TS-701, Revision 1)

Evaluation was performed to determine if the technical group is capable of performing all assigned responsibilities, personnel are knowledgeable of their duties, a training program exists to enhance and develop the skills and knowledge of personnel, and non-technical personnel are utilized for non-technical tasks.

The criteria of TS-701 were met except as noted in TQ-211, Criterion D.

ENGINEERING SUPPORT

(INPO Procedure TS-702, Revision 2)

Evaluation of the engineering support functions was performed. These functions included plant performance monitoring, communication with other support groups, control of important documents, and adequacy of engineering support facilities. Determinations were made as follows:

1. Finding (Reference Criterion A)

A plant performance improvement program has not been developed to take advantage of the performance data currently being collected and monitored by the Shift Technical Advisors (STA).

Recommendation

Develop a plant performance program. The program should include modeling, data analysis, mechanisms for improving efficiency and reliability, and responsibility assignments.

Response

We concur with the need for a more effective plant performance improvement program. With STA training scheduled to be completed in July and the addition of two Performance Engineers by January 1, 1982, this function will be re-emphasized and expanded to include the above.

2. **Finding (Reference Criterion C)**

Drawings are not revised in a timely manner to incorporate as-built information. In addition, legibility is not good on laminated copies of some controlled drawings and temporary as-built drawings.

Recommendation

Develop a system to ensure that drawings are issued and revised in a timely manner. Efforts should also be made to improve the readability of drawings.

Response

We concur with the finding regarding timely updates of drawings and will address the issue as part of our efforts in the development of a post-work test plan. Drawing legibility is a chronic problem for which corrective action was initiated about two years ago. Efforts will continue in this area.

3. **Finding (Reference Criterion D)**

The facilities available for document control are not adequate to support the necessary and expected effort.

Recommendation

Review the long-term needs of the on-site Information Resources Management Group and provide additional work and storage space as required. Provide appropriate areas for use and protection of controlled drawing sets throughout the plant, especially in the I&C Shop area adjacent to the control room.

Response

The planned administration building expansion addresses some of this issue. Appropriate areas for use and protection of controlled drawings in the I&C shop area will be provided by January 1, 1982.

NUCLEAR OPERATING EXPERIENCE EVALUATION PROGRAM

(INPO Procedure TS-703, Revision 1)

Evaluation was made of the programs in place for analyzing in-house and industrywide operating events. The reporting, review, and follow-up corrective actions for in-house events were examined, along with the method of disseminating the information to appropriate personnel and the industry. For industry events, examination was made of the sources of information reviewed, the screening process employed in surveying events, and the disposition of events relevant to the plant. Determinations were made as follows:

1. **Finding (Reference Criterion B)**

The program for review of industry events is not fully implemented at the plant. Two new procedures, Nuclear Operations Support Department (NOSD) Procedure 22.01 and Pilgrim Procedure 1.3.33, have been distributed. However, these procedures do not assign specific responsibilities to determine information distribution and action at working levels and do not provide for a follow-up system on action items.

Recommendation

Revise NOSD Procedure 22.01 and Pilgrim Procedure 1.3.33 to include responsibility assignments and a follow-up system to ensure that action items are completed. Provide training to effected personnel.

Response

We concur with the recommendations and will implement procedure changes and provide the necessary training for effected personnel. This action will be completed by January 1, 1982.

2. Finding (Reference Criterion C)

The program for review of in-house and industry events does not include a provision for periodically evaluating its effectiveness. The present scope of quality assurance review does not address effectiveness.

Recommendation

Modify the existing program for review of in-house and industry experiences to include periodic evaluations for effectiveness. These periodic evaluations should determine the depth of understanding by the group(s) receiving the information, i.e., operations, mechanical maintenance, electrical maintenance, instrument and control, etc. The program should be independently reviewed by knowledgeable individuals to ascertain that information is provided to the right people in a timely manner and corrective actions are being implemented.

Response

We concur with the need to evaluate the effectiveness of the operating experience feedback system. Since an independent review is essential to an objective review, we will assign the responsibility of performing these periodic reviews to an off-site group.

PLANT MODIFICATIONS

(INPO Procedure TS-704, Revision 1)

Evaluation of the program for processing plant design changes was performed to determine if changes are implemented in a timely manner while maintaining the quality of plant systems, structures, and components. Review of proposed modifications, prioritization, tracking, testing, verification of installation, and closeout of the design change package were examined. Determinations were made, as follows:

1. Finding (Reference Criterion B)

Effective coordination for design, installation, and testing of plant design changes is not evident.

Recommendation

Establish more effective communications among all groups, on-site and off-site, involved in the Plant Design Change Request (PDCR) process. Designating an individual in each group to act as contact point for PDCRs can aid in establishing improved communications and coordination.

Response

We concur with the finding regarding more effective coordination among the on-site and off-site groups. We have addressed this issue as part of our overall effort to upgrade our Integrated Work Management System and its primary components: Site Work Control System, Inter-departmental Work Request and Authorization Control System, and Plant Design Change Control System.

2. Finding (Reference Criterion C)

PDCRs are not adequately tracked. PDCR status cannot be readily determined from the time an approved request leaves the plant until it is installed and the design change is being closed out by the Management Services Group (MSG).

Recommendation

Provide a method furnishing information to the MSG tracker at each stage in the PDCR package so current status of the PDCR can be determined.

Response

We concur with the finding of inadequate tracking. We have addressed this issue as part of the overall upgrade of our Integrated Work Management System.

3. Finding (Reference Criterion F)

Entries in the Lifted Wire and Temporary Jumper Log reflect the use of a temporary plant change mechanism to effect permanent plant modifications. These changes are not reflected in plant drawings and other documents and the effect on subsequent plant design changes may be overlooked.

Recommendation

Establish a review schedule of suitable frequency for evaluating entries in the Lifted Wire and Temporary Jumper Log. The review should be conducted by an individual or group independent of operations and knowledgeable of subsequent plant modifications. Entries exceeding a specified length of time in the log should be considered for processing as PDCRs.

Response

We concur with the findings and plan to factor the potential for temporary modifications into our design input and review phases of the Plant Design Change Control System. We also plan to conduct a review of the jumper/lifted lead process to determine if adequate management controls are in place. A periodic assessment of the entries will be considered as part of the review process.

4. Finding (Reference Criterion I)

Effective operator training, drawings, revisions and procedure revisions that result from plant modifications may not be completed prior to placing modified systems in service. Posted Operations Review Committee minutes do not effectively convey modification purpose, scope, or operating philosophy for most plant modifications.

The backlog of PDCR packages in the close-out stage creates the potential for systems being placed in service with inadequate information available for the operators.

Recommendation

Provide operators with training, revised as-built drawings, updated procedures, and surveillance requirements regarding installed PDCRs on a formal basis prior to placing modified systems in service. Operator understanding of plant and procedure modifications should be periodically evaluated. Initiate action to relieve the backlog of PDCR packages currently awaiting closeout by the MSG.

Response

We concur with the finding regarding a need to improve in various phases of our Plant Design Changes Control System. We have initiated efforts to establish a more clearly defined and regimented post-work test plan which will address at least those elements alluded to in the finding. It is planned to have this effort completed prior to startup from the 1981 outage.

ON-SITE REACTOR ENGINEERING

(INPO Procedure TS-705, Revision 2)

Evaluation of reactor engineering was performed to assess the use of appropriate procedures, computer programs and control of changes to them, and the support functions provided by the on-site reactor engineers during all modes of plant operation. Additional areas evaluated included communication with other groups that coordinate with the site reactor engineers, the dedication to the maintenance of fuel cladding integrity, and the involvement in refueling activities. Determinations were made as follows:

The criteria of TS-705 were met.

ADMINISTRATIVE APPENDIX

I. LISTING OF AREAS EVALUATED

ORGANIZATION AND ADMINISTRATION

OA-101 Objectives
OA-102 Organization Structure
OA-103 Administrative Controls
OA-104 Quality Programs
OA-106 Industrial Safety
OA-107 Surveillance Program
OA-108 Personnel Qualifications

TRAINING AND QUALIFICATIONS

TQ-211 Training Organization and Administration
TQ-221 Training Resources
TQ-231 Training Effectiveness
TQ-242 Non-Licensed Operator Training
TQ-243 Licensed Operator Training
TQ-244 Licensed Operator Requalification Program
TQ-245 Shift Technical Advisor Training

OPERATIONS

OP-301 Organization and Administration
OP-302 Tagout Practices
OP-303 Conduct of Shift Operations
OP-304 Use of Procedures
OP-305 Plant Status Controls
OP-306 Operations Facilities and Equipment
OP-307 Shift Turnover

MAINTENANCE

MA-401 Maintenance Organization and Administration
MA-402 Preventive Maintenance
MA-403 Maintenance Procedures
MA-404 Work Control System
MA-405 Maintenance History
MA-406 Control and Calibration of Test Equipment and Instrumentation
MA-407 Control of Special Processes
MA-408 Maintenance Facilities and Equipment

RADIATION PROTECTION AND CHEMISTRY

RC-501 Radiation Protection and Chemistry Organization and Administration
RC-502 ALARA Program
RC-502 Personnel Dosimetry
RC-504 Radiation Surveillance and Control
RC-505 Waste and Discharge Control (Liquid)
RC-506 Radiological Survey Equipment Control and Calibration
RC-507 Personnel Health Physics Indoctrination
RC-508 Process Water Controls
RC-509 Health Physics Facilities and Equipment
RC-511 Respiratory Protection Program

TECHNICAL SUPPORT

TS-701 Technical Support Organization and Administration
TS-702 Engineering Support
TS-703 Nuclear Operating Experience Evaluation Program
TS-704 Plant Modifications
TS-705 On-Site Reactor Engineering

II. BOSTON EDISON COMPANY PERSONNEL CONTACTED

Manager of Nuclear Operations
Staff Assistant
Staff Assistant - Nuclear Safety
Chief - Management Service Group
Chief - Maintenance Group
Chief - Technical Group
Chief - Radiological Group
Senior Plant Engineers
Senior Compliance Engineer
Senior Planning Engineer
Senior Fire Protection Engineer
Senior Reactor Engineer
Senior Chemical Engineer
Senior Instrument and Control Engineer
Senior Maintenance Engineer
Senior Nuclear Training Specialist
Senior Quality Assurance Engineer
Senior Quality Control Engineer
Senior Reliability Engineer
Senior ALARA Engineer
Nuclear Watch Engineer
Nuclear Operations Supervisors
Nuclear Plant Operators
Nuclear Maintenance Supervisors
Instrument and Control Supervisors
Operational Quality Control Group Supervisor
Acting Supervisor, On-Site Information Resources Management Group
Stores Supervisor
Health Physics Records Supervisor
Health Physics Supervisor
Reactor Engineer
Chemical Engineer
Plant Engineers
Quality Control Engineer
ALARA Engineer
Radiological Engineer
Shift Technical Advisors
Nuclear Control Technicians
Nuclear Auxiliary Operator
Manager - Stores Department
Quality Control Inspector
Physician's Assistant
Nuclear Training Specialist
Maintenance Skills Instructor
Waste Management Coordinator
Health Physics Technicians
Health Physics Clerk
Training Group Clerk
Instrument and Control Clerk

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