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WILLIAM D. HARRINGTON
SENIOR VICE PRESIDENT
NUCLEAR

April 15, 1983

BECO Letter No. 83-97

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

License No. DPR-35
Docket No. 50-293

SUBJECT: Response to NRC Generic Letter #82-33
dated December 17, 1982

Dear Sir:

Boston Edison Company has reviewed the requirements and guidance outlined within the subject letter, and is furnishing, by Attachment to this letter, a proposed schedule which Boston Edison believes meets the requirements identified in Supplement 1 to NUREG-0737.

Boston Edison believes that Emergency Operating Procedures (EOP's), must be supported by the proper control room environment and by readily available information on key plant parameters. Boston Edison will pursue a logic and determine the equipment and data backfits required to support the new emergency operating procedures. This logic is reflected in the proposed schedule for implementation of EOP's, Control Room Design Review (CRDR), Safety Parameter Display System (SPDS) and Regulatory Guide 1.97 improvements.

To supplement these plant changes, Boston Edison has included the Emergency Operations Facility (EOF), Technical Support Center (TSC), and Operations Support Center (OSC). The existing facilities meet the functional objectives of Supplement 1 and, when upgraded in accordance with the attached schedule, will meet the additional requirements.

Boston Edison believes it has an effective Emergency Response Capability (ERC) Program. Our plan for the required backfits, has set a schedule with reasonable and achievable goals. The changes to our ERC Program considers the impact to plant and personnel. Attachments A - E outline our plan and responses to Enclosure 1 of Generic Letter #82-33. Deviations from the NRC objectives are noted.

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Mr. Darrell G. Eisenhower, Director
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We trust this is responsive to your objectives. We are available to meet with members of your staff, at your convenience, to discuss our plan and answer any questions you may have.

Very truly yours,

W D Harrington

(Commonwealth of Massachusetts)
(County of Suffolk)

Then personally appeared before me, Mr. W. D. Harrington, who, being duly sworn, did state that he is Senior Vice President - Nuclear of Boston Edison Company, the applicant herein, and that he is duly authorized to execute and file the submittal contained herein in the name and on behalf of Boston Edison Company and that the statements in said submittal are true and to the best of his knowledge and belief.

My Commission expires:

October 21, 1988

Peter M. Kahle
Notary Public



1.C.1 UPGRADE EMERGENCY OPERATING PROCEDURES (EOP's)

Our Emergency Response Capabilities Program is based on the EOP's developed from the BWR Owners Group Emergency Procedure Guidelines (EPG's).

As you know, the EOP Program has been evolving since November 1979. In accordance with previously issued staff guidance, (NUREG-0737 1.C.1), General Electric had performed a re-analysis of transients and accidents which are applicable to PNPS. The document outlining the subject analysis is General Electric NEDO 24708A Rev. 1 which was sent to your staff in December, 1980.

The Generic EPG's Rev. 1 were sent to your staff in January, 1981. This document is GE NEDO 24934. We believe this report sufficiently details operator tasks, information and control needs. EPG's Rev. 2 was sent to your staff in June, 1982. In accordance with NRC Generic Letter #82-05, we are proceeding with implementation of our EOP Program. This document will also serve as the basis for integrating control room design review, safety parameter display system design and the emergency operating procedures.

As outlined in our plan, the appropriate operator training will be performed prior to our scheduled implementation of the plant specific emergency operating procedures. Additionally, we intend to submit to NRC our procedures generation package at least three months prior to the start of our operator training on the EOP's.

We believe this plan for upgrading Emergency Operating Procedures is responsive to the staff's objectives. Our planned implementation date is November 28, 1984.

I.D.2 SAFETY PARAMETER DISPLAY SYSTEM

Boston Edison is evaluating options that might improve the present information requirements and the associated acquisition/distribution capabilities in order to support effectively the operator and enhance the Emergency Response Facilities. We intend to consider the various guidance documents such as NUREG-0696, Regulatory Guide 1.97 (Rev. 2), BWROG Graphic Display System (GDS) evaluation, and the INPO guidelines for an effective SPDS implementation. We believe the best approach to incorporating the suggested guidance is to base the objective for the SPDS on operator information requirements and augment the Emergency Operating Procedures. This integrated approach is essential to ensure the final product provides reliable, accurate and more importantly useable information for the control room personnel.

Our plan involves the installation of a SPDS that is convenient to the control room operator. The system will display the information from which the plant safety status can be readily and reliably assessed by control room personnel who are responsible for avoiding degraded conditions. A continuous display will not be provided. The SPDS display will be designed to incorporate accepted human factors principles.

The minimum information provided to the operators will be sufficient to determine containment conditions, reactor coolant system integrity, reactivity control conditions, reactor core cooling and radioactivity conditions. The specific parameters and their display configuration will be determined based on EOP information requirements, Emergency Response Facility information requirements (i.e., TSC and LOF data needs), and will be consistent with operator information requirements.

The SPDS will be suitably isolated from electrical or electronic interference with equipment and sensors that are in use for safety systems. Additionally, procedures which describe the timely and correct safety status when the SPDS is not available will be developed in parallel with SPDS implementation. Operator training will be based on their response to degraded conditions with and without the SPDS available.

A written safety analysis will be prepared and submitted to the staff prior to implementation of our SPDS detailing the basis on which the specific parameters selected are sufficient to assess the safety status of the plant. Our proposed SPDS system will be reviewed in accordance with PNPS Technical Specifications to determine whether the changes involve an unreviewed safety question or a change to Technical Specifications. Your review and concurrence is necessary prior to our implementation of the PNPS SPDS.

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The schedule for SPDS implementation considers the effective integration of control room design, EOP's and NRC comments. However, in order to integrate effectively those initiatives, the schedule is constrained in some instances by Control Room Design, upgraded EOP's and NRC comments. Therefore, we intend to complete our conceptual design and send our Safety Analysis for SPDS to NRC by November 15, 1984. At that time we expect to finalize our design and implementation scope and by December 20, 1984 inform NRC of our commitments for final implementation.

I.D.1 CONTROL ROOM DESIGN REVIEW

Boston Edison has provided a control room whose design and environment adequately supports the operators' abilities to cope with normal operations and degraded conditions.

We have participated actively on the BWROG control room design review committee. A BWROG control room survey has been performed at Pilgrim Station and will serve as the basis of our program. The Control Room Design Review Program will include establishment of a multi-disciplinary review team including at least one member with established human factors engineering credentials. The BWROG review report will be analyzed, and those areas needing re-review or which were omitted in the original survey will be completed. In the task analysis phase of the program we plan to use the BWROG "generic" EPG's and our new plant-specific EOP's to develop the display/control requirements for emergency conditions. These requirements will be compared with the control room inventory to delineate missing displays and controls, if any.

Human factors engineering principles will be incorporated into our review methods to identify control room design discrepancies. The survey will include an assessment of control board layouts, the usefulness of audible and visual alarms, information recording and recall, task analysis, and control room environment. Based on the review a list of human engineering discrepancies will be defined. In order to verify any selected design improvements, we will coordinate the changes considering the impact on control room personnel, contribution to risk due to change, unreviewed safety questions and changes resulting from other improvement programs (such as SPDS). It is not expected that all discrepancies requiring changes will result in changes to control panels alone. Some discrepancies may result in procedural modifications or new training programs.

Our design review program will consider the various guidance documents such as NUREG-0700, NUREG-0801, BWORG survey program plans, and the INPO Guidelines for Control Room Design Review.

As outlined in the plan, our final completion date for control room modifications is not yet scheduled. However, we believe our plan and approach is consistent with the staff's objectives. We have provided our detailed schedule for completion of the control room design review phase of the plan, which is scheduled for completion by September 23, 1984.

REGULATORY GUIDE 1.97, REV. 2

In order to provide a comprehensive implementation schedule, Boston Edison expects to approach the PNPS/Regulatory Guide 1.97 analysis in a two phase manner. The first phase would be to compare the PNPS design base to Regulatory Guide 1.97 criteria, and if modifications are required, provide an implementation schedule that will be consistent with BECo's proposed Long Term Program.

Boston Edison intends to do an item-by-item comparison between all the requirements of Regulatory Guide 1.97, Rev. 2 and the applicable systems and components of PNPS. Any deviations found will be systematically evaluated and documented to determine if the deviation is justifiable due to plant-specific design, original design bases, supportive operational requirements, etc. Any deviations not found to be justifiable will be evaluated to determine what modifications, if any, are needed to conform to Regulatory Guide 1.97, Rev. 2.

As outlined in our plan, our final completion date for Regulatory Guide 1.97 modification installations is not yet scheduled. We believe our plan and approach is consistent with the staff's objectives and are providing a Regulatory Guide 1.97 report by April 19, 1985.

III.A.1.2 UPGRADE EMERGENCY SUPPORT FACILITIES

Boston Edison has established a well-balanced integrated organizational structure to provide for overall management and technical support of Pilgrim Nuclear Power Station. This support is described in detail in the PNPS Emergency Plan to accomplish the overall emergency preparedness objectives for accident assessment, response, mitigation and recovery efforts. In developing the emergency plan, we have analyzed all of the functions necessary to meet these objectives and can carry out these functions utilizing the skills and capabilities of a well-balanced integrated organization.

Present minimum staffing requirements at Pilgrim Station include one licensed (SRO) Nuclear Watch Engineer; one licensed Nuclear Operating Supervisor (SRO or RO); one licensed Nuclear Plant Operator (RO); two unlicensed Nuclear Plant Operators; one Nuclear Auxiliary Operator; one Health Physics Technician; and one Shift Technical Advisor. Therefore, our present minimum complement is eight (8) individuals. In addition, we are presently staffed with radiochemistry coverage two shifts/day, five days/week and one shift/day on weekends. Also, instrument and control coverage is presently one shift/day, five days/week.

Our experience demonstrates that the staffing levels described above assure adequate coverage for prompt emergency plan implementation. The present staffing has been reviewed discipline by discipline in terms of the time frame required to activate the emergency organization. This review has demonstrated that, although we can meet the intent of the Table 2 to the enclosure requirements, we cannot specifically comply with the rigid time requirements. Although unable to meet your schedule, it has been determined that all of the emergency functions can be activated in a timely manner so as not to impede the continuity of the immediate assessment, mitigation and response functions. We have examined in practical terms the locations of the residences of all of the plant personnel with immediate emergency responsibilities and have outlined on Table 1 the response time from their residences to Pilgrim Station. The response times indicated on the Table are realistic estimates based upon the time required for an individual awakened from sleep by a telephone call to get dressed and travel to the station and respond to their emergency assignment.

While Boston Edison endorses the functional objective of on-shift augmentation within 20 minutes for emergency response, we cannot support the response time guidance of Table 2 to the enclosure. The imposition of such requirements would force limitations on the housing and behavioral patterns of individuals. While PNPS may often meet the proposed 30 minute staff augmentation objective, this would be difficult to guarantee.

Boston Edison submits that it complies with the functional objectives demonstrated by the Minimum Staffing Requirements for Nuclear Power Plant Emergencies as outlined in Table 2 to the enclosure.

TABLE 1
ACTIVATION OF EMERGENCY PERSONNEL

		<u>RANGE OF MAXIMUM RESPONSE TIME TO PILGRIM STATION</u>		
	<u>ON SHIFT</u>	<u>30-40 MIN.</u>	<u>40-50 MIN.</u>	<u>50-60 MIN.</u>
I&C Supervision		0	1	3
Technician		2	5	7
Maint. Supervision		1	1	7
Mechanical		1	4	8
Electrical		0	2	2
Health Physics				
Supervision		0	6	0
Technicians	1	4	6	0
Operations Personnel	6	1	16	19
Reactor Engineering/ STA's	1	0	5	5
Technical Support		0	2	1
Plant Management		3	1	1
Plant Support (Stores, Admin.)		5	6	9
Chem. Supervision		0	1	1
Technicians		1	1	2

PILGRIM STATION EMERGENCY RESPONSE FACILITIES

This section describes the PNPS Emergency Response Facilities and equipment including the Control Room, On-site Technical Support Center, and On-site Operational Support Center, and near site and alternate Emergency Operations Facility.

These facilities and equipment enhance Boston Edison's ability to:

- (1) Identify, classify and mitigate the consequences of an abnormal plant condition;
- (2) Mobilize the emergency response and recovery organization;
- (3) Provide technical staff in addition to and in support of control room personnel;
- (4) Provide personnel to perform maintenance and other plant service activities in support of Emergency Operations;
- (5) Assess the radiological and radiological consequences of the plant conditions to the general public and make recommendations to state and local officials concerning protective actions.

Each facility is provided with adequate equipment and information to assure that the response and recovery functions of the Emergency Organizations will be fully accomplished.

Activities, in response to emergencies at Pilgrim Nuclear Power Station are directed and controlled from two locations. Initially, activities are directed from the Main Control Room; however, if the situation escalates to an Alert, Site Emergency or General Emergency, the near site Emergency Operations Facility and Technical Support Center are activated as described in the Emergency Plan. The following subsections describe the Emergency Control and Support Facilities and Equipment for the Pilgrim Nuclear Power Station (PNPS).

CONTROL ROOM

The Control Room is designed to remain habitable under conditions which could result from the most severe design basis accident analyzed in the PNPS FSAR. Nuclear plant instrumentation is provided in the Control Room to give early warning of a potential emergency and provides for a continuing evaluation of the emergency situation. The Control Room contains the controls and instrumentation necessary for operation of the reactor and turbine generator under normal and emergency situations.

Additional equipment such as meteorological instrumentation displays and communication equipment is available in the Control Room. The Meteorological Data Acquisition Computer (MDAC) located in the EOF, is used to compile data from the meteorological instrumentation and has a display device installed in the Control Room. The MDAC is also used to estimate off-site projected doses. Self-contained breathing apparatus is maintained in the Main Control Room.

Direct radio and telephone communications capability is maintained in the Control Room to provide prompt alerting of and immediate information to federal, state and local officials. Until the Emergency Operations Facility is activated and staffed, the Main Control Room is the focal point from which all emergency activities are directed and controlled by the Emergency Director.

TECHNICAL SUPPORT CENTER

1. Location

The existing Technical Support Center (TSC) is located on the lower level of the Main Guard House within the protected area of the plant. This facility meets all of the guidelines discussed below with the exception of size, habitability, and direct availability of technical data.

Boston Edison intends to provide an upgraded TSC considering the guidelines contained in NUREG-0696. Our new TSC will be located in the new Administration Building. The Administration Building is scheduled for completion and occupancy during October, 1983. A schedule for equipping the new TSC with remote monitor and data links from the existing TSC, and installation of filters, will be completed and submitted by October 31, 1983. However, it must be noted, we believe the existing TSC sufficiently complies with the guidance outlined in the enclosure to Generic Letter #82-33.

The Technical Support Center (TSC) allows TSC personnel to perform the following functions:

- analyze current and projected plant status
- through communications with the Emergency Director and Watch Engineer, provide technical support and recommendations regarding emergency actions
- analyze and resolve mechanical, electrical and instrument and control problems
- analyze and resolve thermohydraulic and thermodynamic problems

- analyze and develop guidance on the protection of the core to assist operations personnel

2. Staffing and Training

Whenever a site or general emergency is declared, the following personnel will immediately report to the TSC and assume their duties:

1. TSC Supervisor (Assigned by the Emergency Plan)
2. Health Physics Supervisor
3. Reactor Engineer
4. Shift Technical Advisor (Off-duty)
5. Operations Engineer
6. Chemical Engineer
7. Maintenance Engineer
8. I&C Engineer
9. Computer Engineer
10. Administrative Assistants (clerical support)

The TSC Supervisor coordinates activities in the TSC and interfaces with the Control Room, OSC and EOF. All personnel associated with the TSC receive training describing their responsibilities during the emergency situation. In addition, personnel participate in periodic drills.

3. Size

The total floor area of the existing TSC is about 500 ft.². The total area of the upgraded TSC will be approximately 5700 ft.². Included in this space will be approximately 1000 ft.² for mechanical, electrical and filtering equipment; 2000 ft.² for data system equipment, processing, displaying and transmission of data; communication system; repair and maintenance of all the above equipment; 2700 ft.² for working space, including NRC consultation room and toilet facilities.

4. Structure

Both the existing TSC and the upgraded TSC will be built in accordance with the uniform Building Code. The upgraded TSC will not be seismic Category 1, nor be qualified as an engineered safety feature (ESF).

5. Habitability

The existing TSC does not meet the habitability criteria specified in General Design Criteria (GDC) 19. The upgraded TSC will provide personnel with protection from radiological hazards, including direct radiation and airborne radioactivity from implant sources under accident conditions in accordance with GDC 19, SRP 6.4 and NUREG-0737, Item II.B.2.

The upgraded TSC ventilation system shall function in a manner comparable to the Control Room ventilation system but will not be seismic Category 1 qualified, redundant, instrumented in the Control Room, or automatically activated. It will include high-efficiency particulate and charcoal filters.

Continuous radiation monitors either installed or portable, will be provided for the protection of TSC personnel. These systems shall continuously indicate radiation dose rates and airborne radioactivity concentrations inside the TSC while it is in use during an emergency. Local alarms with trip levels set to provide early warning to TSC personnel of adverse conditions will be incorporated into the design.

6. Communication

The existing Technical Support Center is provided with reliable voice communication to the Control Room (CR), Operations Support Center (OSC), Emergency Operations Facility (EOF), NRC, and state and local operations centers. The upgraded TSC will also have reliable voice communications including:

- (a) Emergency Notification System
- (b) Dedicated telephones to the CR, and EOF
- (c) Designated telephones for NRC use (2)
- (d) Facsimile transmission capability to EOF and NRC Operation Centers

7. Instrumentation, Data System Equipment and Power Supplies

The existing TSC has access to data needed to analyze plant conditions. A description of this equipment is provided in the following section. Plans for upgrading this equipment will be considered based on SPDS and Regulatory Guide 1.97 modifications and TSC functions. The TSC is and will continue to be equipped with backup power source to the normal power supply.

8. Technical Data and Data System

The existing TSC is equipped with the following devices:

- A repeat of the plant's computer's Video Display, with 6 lines dedicated to trending variables which can display all data presently input to the plant computer.
- A TV monitor mounted in the control room which provides a view of the control room instruments.
- Two dual channel strip chart recorders for trending selected computer points.
- Remote operator's console for accessing, displaying and printing various plant parameters via the process computer.

Upgrade of the present instrumentation and data display capabilities at PNPS is under evaluation. Details on these plans are addressed under the section on SPDS and Regulatory Guide 1.97.

9. Records Availability and Management

Personnel in the upgraded TSC will have access to the following information:

- Plant Technical Specifications
- Selected Plant Operating Procedures
- Selected Emergency Operating Procedures
- Final Safety Analysis Report
- Selected Plant Operating Records
- Selected Drawings

OPERATIONAL SUPPORT CENTER

1. Functions

The on-site Operations Support Center (OSC) is located adjacent to the PNPS Maintenance Office Area and will be staffed by auxiliary operators, health physics technicians, maintenance and other plant personnel. These personnel are available to support the station operation and recovery functions as directed by the control room.

2. Habitability

The OSC is located outside the Rector Building (Secondary Containment) atmosphere boundary. However, in the event that the OSC becomes uninhabitable, an area adjacent to the control room may be designated as the alternate OSC.

3. Communications

The OSC is equipped with Plant Page System, telephone with direct off-site commercial network access, and access to maintenance office telephones.

4. Upgraded OSC

An upgraded OSC, consisting of approximately 300 sq. ft. will be inside the new TSC protected area and adjacent to the planned maintenance office area. It will be similarly equipped.

EMERGENCY OPERATIONS FACILITY

1. Functions

The near site Emergency Operations Facility (EOF) is five separate yet integrated units whose function is to assist Boston Edison to effectively and efficiently manage the overall licensee response to emergencies at PNPS. Each unit has been designed primarily to fulfill the following functions respectively:

- (1) Radiological and Environmental Assessment
- (2) Communications
- (3) Logistic Support
- (4) Decontamination and First Aid
- (5) Discussion and Briefing Area

The EOF will provide a means for high level interaction and communication among key personnel to include licensee, local, state and federal agencies as well as other support groups.

2. Location, Structure and Habitability

The EOF is located approximately a quarter of a mile west of the reactor building, and consists of mobile offices.

The habitability of this facility has been carefully evaluated. Detailed analysis (available for your review) has led to the determination that the EOF would be habitable under conditions that would exist during the Design Basis/Loss of Coolant Accident analyzed in the PNPS Safety Evaluation Report. The results of these analyses indicate that the total thirty-day dose to occupants of the EOF, following a LOCA, is about 3.1 Rem to the total body and about 5.6 Rem to the thyroid. These calculated doses are well below the limits specified in GDC 19 for dose limits to control room operators following an accident.

In the unlikely event the EOF is uninhabitable, an alternate EOF has been designated in Bridgewater at the Massachusetts Civil Defense Agency Area II Headquarters roughly 20 miles from PNPS. This is the location from which the state would coordinate emergency operations for Southeastern Massachusetts in the event of an emergency at PNPS. This would co-locate Boston Edison, state and federal agencies in the spacious Emergency Operating Center routinely utilized by all the state agencies involved in emergency response and will provide all of the necessary facilities and equipment to assure uninterrupted high level interaction and coordination among all key personnel. This will provide continuity of dose projections and availability of immediate actions for public protection.

Separate space, upstairs from and adjacent to the MCDA facility, has been dedicated for AEOF use. It has been permanently equipped with necessary telephone and radio equipment, maps and copying equipment, and includes an alternate press briefing area.

3. Staffing and Training

The Emergency Operations Facility is staffed by qualified members of the plant staff and other such qualified personnel as may be designated by plant and corporate management. This staff includes, but is not limited to:

- Emergency Director
- Radiation Emergency Team Coordinator
- Monitoring Team Leaders and Members
- Environmental Assessment Engineers
- Public Information Director

- Administrative Assistants (clerical support)
- Physician's Assistant
- Manpower Coordinator
- Emergency Communications Coordinator

The EOF staff has received training in their areas of responsibility and have participated in EOF activation drills conducted periodically in accordance with the Emergency Plan for PNPS, as well as one large-scale integrated annual exercise.

4. Size

The primary EOF provides approximately 3500 sq. ft. of working space. This provides adequate space for the personnel, records, and equipment required to assess the conditions within the plant and the surrounding environments.

5. Radiological Monitoring

To ensure adequate radiological protection of EOF personnel, radiation monitoring systems are provided in the EOF. These monitoring systems are composed of dedicated portable monitoring equipment which will continuously indicate radiation dose rates and airborne radioactive contamination inside the EOF while it is in use during an emergency.

6. Communications

The EOF has reliable voice communications facilities to the NRC, the control room, and state and local emergency operations centers.

The EOF voice communication equipment includes:

- Hotline telephones ENS and HPN
- Dedicated telephones to TSC and CR
- Intercommunications between work areas of EOF
- Radio communications to environmental monitoring teams
- Communications to state and local operations centers
- NRC office space with adequate telephone capabilities

The backup to this communication network includes radio communications with local and state police and local, state and federal emergency management agencies.

7. Instrument, Data System Equipment and Power Supplies

Equipment is provided in the EOF to gather, store and display data needed in the EOF to assess the environmental impact of the emergency as it develops. The EOF data system performs its function without degrading or interfering with control room functions.

The EOF electrical equipment load is normally powered from off-site power. A backup source of power is supplied by the security system diesel generator. Circuit transients or power supply failures and fluctuations do not cause a loss of stored data. All telephone equipment is tied to the security uninterrupted power supply.

8. Technical Data and Data System

The EOF is presently equipped with digital displays of wind speed and direction, temperature and delta temperature as measured at the 33 foot and 220 foot elevations of the PNPS meteorological tower. The EOF is also provided with a meteorological data acquisition system minicomputer system which records, analyzes and displays the data. Additional EOF data requirements are being addressed with the TSC data requirements under SPDS.

9. Records Availability and Management

The EOF records shall include the following information:

- Plant Technical Specifications
- Selected Plant Operating Procedures
- Emergency Operating Procedures
- FSAR
- Emergency Plan (BEC, state, local)
- Off-site Population Distribution Data
- Evacuation Plans
- Selected Radiological Monitoring Records
- Selected Plant Drawings

