April 17, 1996

Mr. E. Thomas Boulette, Ph.D
Senior Vice President - Nuclear
Boston Edison Company
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, MA 02360

50-293

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE PILGRIM INDIVIDUAL PLANT EXAMINATION OF EXTERNAL EVENTS (IPEEE), (TAC NO. M83660)

Dear Mr. Boulette:

Enclosed is a request for additional information based on Boston Edison's IPEEE submittal dated July 1994. Your response to this request should be provided within 60 days of receipt of this letter to support our current review schedule.

The requirement affects nine or fewer respondents and, therefore, is not subject to the Office of Management and Budget review under P.L. 96-511.

Questions regarding this request should be sent to me at the letterhead address or you can contact me at (301) 415-3041.

Sincerely,
ORIGINAL SIGNED BY:

Ronald B. Eaton, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosure: Request for Additional Information

cc: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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REQUEST FOR ADDITIONAL INFORMATION

PILGRIM NUCLEAR POWER STATION

A.2 Seismic

1. The submittal states in Section 3.1.6.2 that the fraction of early release associated with the surrogate element is defined to be in the same proportion as that of early release associated with core damage sequences, namely 30.2%. The surrogate element was estimated to be responsible for 2.81% of the core damage frequency of 5.82E-05 per year, or approximately 1.64E-05 per year. Multiplying this value by 0.302 yields a large release frequency contribution from the surrogate of 5.0E-06 per year. The early release frequency contribution of the surrogate element is identified in Section 3.1.6.4 as contributing a frequency of 7.61E-07 to early release. This is a contribution of 4.6%, not 30.2%. Please explain how the conditional probability of early release was calculated for the surrogate element. If the process did not involve a mechanistic assessment of the failure modeled in the surrogate element, explain in detail why the selected method provides a reasonable estimate of early release from the surrogate element failure mode.

2. Please provide the basis for why you found the core damage frequency of 5.82×10^{-5} per reactor-year and early release frequency of 1.59×10^{-5} per reactor-year acceptable to resolve USI A-45.

3. What are the controlling seismic failure modes (including equipment/structure interactions) for the safety-related diesel generators? Please provide the fragility calculations for the controlling failure modes.

4. For the station blackout (SBO) diesel, what are the power demands for use of this component? How is the SBO diesel loaded on the buses to provide power? Please explain how the SBO diesel is brought into operation, identifying the operator actions needed and their coverage in emergency operation procedures (EOPs).

5. Regarding the SBO diesel, please provide the walk-down notes and results, and the fragility calculations for the SBO diesel and its support systems (i.e., fuel supply, batteries, etc.). Further, describe the basis for the identified failure to start and failure to run values for the SBO diesel listed in Table 3-4, addressing the available plant-specific and generic data for the SBO diesel. Finally, please identify the frequency of testing, surveillance, and maintenance for the SBO diesel.

6. Please indicate whether BECo is committing, in the seismic IPEEE submittal, to make the upgrades to the SBO diesel which were assumed in the analysis. If not, provide a discussion of the fragility of the SBO diesel without the upgrades and estimate the impact on CDF, seismically-

initiated accident sequence frequencies, and early release scenario frequencies resulting from the use of the unmodified SBO diesel in the analysis. If so, please discuss the scope of the committed enhancements and the schedule for their implementation.

7. Table 3-11 of the IPEEE submittal lists detailed Pilgrim Seismic Probability Risk Assessment (SPRA) fragilities. This table includes median fragilities (Am) for seismically induced core spray pipe rupture and seismically induced RHR piping rupture of 0.00. Similarly, Table 3-12 provides relay fragilities. This table includes three 0.00 median fragilities (Relays 1810F0801A, 181UF-801A, and All SBO Relays). Please identify whether these 0.00 median fragilities are meant as "place-keeper" values to guarantee failure in an earthquake. If not, please provide the correct value or explain why the value of 0.00g is correct and describe the basis for the value and explain the impact of this low median fragility on the performance of the plant following seismic events (including the contribution of each of these failure events to core damage frequency).

8. For the seismic faults identified in Table 3-15 (page 3-104) of the IPEEE submittal, please provide the contributions of the events to core damage frequency or the importance of the events in order that the significance of the events may be identified.

9. A seismic fragility estimate is not provided explicitly in Table 3-11 for the nitrogen tank which provides Automatic Depressurization System (ADS) operability in the long term. Identify the seismic fragility of the nitrogen tank system (i.e., is this the same as event Condensate Storage Tanks 105 A&B?). In addition, the submittal does not rely on the ADS, apparently due to the low capacity of the nitrogen tanks system. Please discuss the amount of time ADS would be available without the nitrogen system, and indicate whether this time period is sufficient to achieve stable shutdown before the nitrogen system would be required and whether this stable shutdown mode is covered by plant procedures and can be maintained without the nitrogen system. If so, discuss the impact of such a stable shutdown strategy on the SPRA results.

10. The IPEEE submittal discusses a possible interaction between seismically initiated failure of a liquid nitrogen tank and the diesel generators. Please discuss how this interaction was evaluated in the SPRA. If it was not included, discuss the impacts of this interaction on the results of the seismic IPEEE.

11. Please provide a copy of Reference 3-16 (GEI Consultants SSI study for Pilgrim).

A.3 Fire

1. The potential adverse effects on plant-related equipment due to combustion products have not been addressed in the IPEEE submittal, except for the statement that "The concern relative to non-thermal combustion by-products is not addressed." Typically, the non-thermal effects of combustion on safety-related equipment are addressed during the fire walk-down. Please provide an analysis of the effects of combustion products on safety-related equipment.

2. The only seismically-induced fire sources addressed were the release of flammable or combustible liquids or gases. Weakly anchored electrical cabinets have been found to be important seismically-induced fire risk contributors. Please provide either the justification for not considering electrical cabinets as a seismic fire source or the core damage frequency analysis of electrical cabinet seismic/fire interactions.

3. Fire protection systems at Pilgrim have been installed in accordance with NFPA codes. Therefore, the submittal assumed that adequate assurance is provided that fire protection systems will not fall on safe shutdown components during a seismic event. However, only fire piping standpipes are required by NFPA standards to be seismically qualified. Therefore, please provide the basis for assuming that the fire protection systems at Pilgrim (apart from the standpipes) will not fall on safe shutdown components during a seismic event.

4. If the potential for cross-zone fire and smoke spread was not considered, please provide justification for its exclusion. Please provide an analysis of the effect on fire-induced CDF if the potential for the failure of active barrier components such as doors and dampers for all fire areas, and the potential for cross-zone fire propagation is considered for high hazard areas such as the turbine building, diesel generator room, switchgear rooms and lube oil storage areas.

5. Even though four fire events have occurred in safety-related areas at Pilgrim, only industry-wide generic frequencies were used. Please provide an analysis of the effect on fire-induced core damage frequency if the generic data is updated utilizing Pilgrim plant-specific fire data.

6. Were fire-induced loss-of-coolant accidents or inadvertent operation of valves modeled? If these events were excluded from consideration, please provide the justification for exclusion. If they were modeled, please provide the resulting core damage frequency contribution.

7. Please provide a listing of all key fire IPEEE assumptions, as requested by NUREG-1407, Section C.3.

8. Fire compartment interaction analysis should consider fire brigade accessing the fire area through adjacent fire zones that contain cable and equipment from an opposite safety train. Please provide fire scenarios that involve this situation, and describe how they have been considered in the IPEEE submittal.

A.4 HFOs

1. A site-specific tornado hazard analysis was referenced (Reference 5-17 of the IPEEE submittal), but unavailable for review. Please provide this reference so that the tornado hazard review can be completed.