

APR 19 1977

Boston Edison Company
M/C NUCLEAR
ATTN: Mr. G. Carl Andognini
800 Boylston Street
Boston, Massachusetts 02199

Gentlemen:

In response to your request dated October 7, 1976, and a supplement thereto dated December 28, 1976, the Commission has issued the enclosed Amendment No. 23 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station Unit No. 1.

The amendment changes the Pilgrim Unit No. 1 Technical Specifications by replacing the existing Environmental Monitoring Program in its entirety by a new updated Environmental Monitoring Program that has been developed in accordance with NRC Regulatory Guide No. 4.8, "Environmental Technical Specifications for Nuclear Power Plants".

We have reviewed the extent and methodology of the new monitoring program. The program includes sampling and analysis of direct radiation, airborne particulates and radioiodines, soil, water, aquatic biota, sediment, milk and other terrestrial food chains. Our review has determined that the program, with minor revisions agreed to by the licensee to meet Regulatory Guidance contained in Regulatory Guide 4.8, is acceptable to the staff and meets the objectives of a monitoring program for verifying projected or anticipated radioactivity concentrations and related public exposures.

We have evaluated the potential for environmental impact of operation in accordance with the enclosed amendment. We have determined that the effect of the changes authorized are administrative or relate only to the frequency, type and location of samples taken in support of the environmental monitoring program being carried out by Boston Edison to quantify the environmental impact of the operation of Pilgrim Unit No. 1.

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APR 19 1977

Because the nature of this amendment is limited to administrative matters, we have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level, and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

The amendment applies only to the environmental monitoring program, and it does not involve significant new safety information of a type not considered by a previous Commission safety review of the facility. It does not involve a significant increase in the probability or consequences of an accident, does not involve a significant decrease in a safety margin, and therefore does not involve a significant hazards consideration. We also have concluded that there is reasonable assurance that the health and safety of the public will not be endangered by this action nor will it be inimical to the common defense and security.

A copy of the related Notice of Issuance is also enclosed.

Sincerely,
Original signed by

Don K. Davis
Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

Enclosures:

1. Amendment No. *23* to License No. DPR-35
2. Notice

cc w/enclosures:
See next page

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| DATE > | <i>3/23/77</i> | 3/23/77 | <i>3/15/77</i> | <i>4/19/77</i> | |

April 19, 1977

cc w/enclosures:
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cc w/enclosures and cy of
BECO filings dtd. 10/7/76 and
12/28/76:
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Commissioner
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Quality Engineering
100 Cambridge Street
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

BOSTON EDISON COMPANY

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 23
License No. DPR-35

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Boston Edison Company (the licensee) dated October 7, 1976, and a supplement thereto dated December 28, 1976, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B of Facility License No. DPR-53 is hereby amended to read as follows:

3.B Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 23, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 19, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 23

FACILITY OPERATING LICENSE NO. DPR-53

DOCKET NO. 50-293

The following changes relate to the Appendix A portion of the Pilgrim Unit No. 1 Technical Specifications. The changed areas on the revised pages are shown by marginal lines.

| <u>Remove Pages</u> | <u>Insert Pages</u> |
|---------------------|---------------------|
| 181 | 181* |
| 182 | 182 |
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| | 187a |
| 188 | 188* |
| 223 | 223 |

*No changes on these pages. They are included for convenience in updating the basic Technical Specifications.

3.8.B Airborne Effluents (Cont'd)4.8.B Airborne Effluents (Cont'd)

otherwise the cartridges shall be removed and analyzed daily until a steady release level has been established. These filters shall be analyzed for I-131 (charcoal), gross radioactivity (B, γ) and Ba-La-140 and I-131 (particulate).

7. The weekly charcoal filters shall be analyzed for I-133 and I-135 at least quarterly.
8. The weekly particulate filters shall be analyzed for gross alpha radioactivity at least quarterly. A composite of a months' filters shall be analyzed for Sr-89 and Sr-90 at least quarterly and principal gamma emitting nuclides monthly.
9. When the average daily gross radioactivity release rate equals or exceeds that given in 3.8.B.3 or increases by 50% over the previous day, the iodine and particulate cartridge shall be analyzed to determine the release rate increase for iodines and particulates.
10. All waste gas monitors shall be calibrated at least quarterly by means of a built-in check source and annually with a known radioactive source. Each monitor shall have an instrument channel test at least monthly and sensor check at least daily.
11. At least annually, automatic initiation and closure of waste gas system shall be verified.

D. Environmental Monitoring Program

An environmental monitoring program shall be conducted to evaluate the effects of station operation on the environs and to verify the effectiveness of the source controls on radioactive materials.

SURVEILLANCE REQUIREMENTS

4.8.D Environmental Monitoring Program

An environmental monitoring program shall be conducted as follows:

1. Environmental samples shall be selected and analyzed according to Table 4.8.1 at the locations described in Tables 4.8.2 and 4.8.3 and shown in Figures 4.8.1, 4.8.2 and 4.8.3.
2. Analytical techniques used shall be such that the detection capabilities in Table 4.8.4 are achieved.
3. A census of gardens producing fresh leafy vegetables for human consumption (e.g., lettuce, spinach, etc.) shall be conducted near the end of the growing season to determine or verify the location of the garden (available for sampling) yielding the highest calculated thyroid dose. This census is limited to gardens having an area of 500 square feet or more and shall be conducted under the following conditions as necessary to meet the above requirement:
 - a. Within a 1-mile radius of the plant site, enumeration by a door-to-door, or equivalent counting technique.
 - b. If no milk-producing animals are located in the vicinity of the site, as determined by item 4 below, the census described in item 3a above shall be extended to a distance of 5 miles from the site.

If the census indicates the existence of a garden at a location yielding a calculated thyroid dose greater than that from the previously sampled garden, the new location shall replace the garden previously having the maximum calculated iodine concentration. Also, any location from which fresh leafy vegetables can no longer be obtained may be dropped from the surveillance program as long as the NRC is notified in writing, as soon as possible that such vegetables are no longer grown or no longer available at that location.

4. A census of animals producing milk for human consumption shall be conducted at or near the middle of the grazing season to determine or verify the location yielding the highest calculated annual average thyroid dose. The census shall be conducted under the following conditions as necessary to meet the above requirement:
 - a. Within a 1-mile radius from the plant site or within the 15 mrem/yr isodose line, whichever is larger, enumeration by a door-to-door or equivalent, counting technique.
 - b. Within a 5-mile radius for cows and for goats, enumeration derived from referenced information from county agricultural agents or other reliable sources.

If it is learned from this census that animals are present at a location which yields a calculated thyroid dose greater than from previously sampled animals, the new location shall be added to the surveillance program as soon as practicable. The sampling location having the lowest calculated dose may then be dropped from the surveillance program at the end of the grazing season during which the census was conducted. Also, any location from which milk can no longer be obtained may be dropped from the surveil-

lance program as long as the NRC is notified in writing, as soon as practicable, that milk-producing animals are no longer present, or milk samples are no longer available at that location.

5. Deviations are permitted from the required sampling schedule if specimens are unobtainable due to hazardous conditions, seasonal unavailability or to malfunction of automatic sampling equipment. In the event of equipment malfunction, every reasonable effort shall be made to complete corrective action prior to the end of the next sampling period. Any significant deviations from the sampling schedule shall be explained in the annual report.
6. Detailed written procedures, including applicable check lists and instructions, shall be prepared and followed for all activities involved in carrying out the environmental monitoring program. Procedures shall include sampling, data recording and storage, instrument calibration, measurements and analyses, and actions to be taken when anomalous measurements are discovered.

Procedures shall be prepared for insuring the quality of program results, including analytical measurements. These procedures will identify the responsible organizations, include purchased services (e.g., contractual lab), include independent audits, and include systems (such as participation in IAEA and/or NBS intercalibration exercises and submission of "blind" quality control samples for analyses by the contractors) to identify and correct deficiencies, investigate anomalous or suspect results, and review and evaluate program results and reports.

BASES 3.8.D and 4.8.D Environmental Monitoring Program

An Environmental radiological monitoring program is conducted to verify the adequacy of in-plant controls on the release of radioactive materials. The program is designed to detect radioactivity concentrations which could result in radiation doses to individuals not exceeding the levels set forth in 10CFR50 Appendix I.

An example of this is the detection of I-131 in milk. Calculational Models (Regulatory Guide 1.109) have shown that a constant concentration of 3.3 pCi I-131 per liter milk would result in a dose of 15 millirems to the thyroid of an infant consuming that milk for a year. Allowing for an open grazing season of six months, and a maximum of two half-lives between event and sampling, the lower limit of detection at time of sampling must be 1.5 pCi/l ($3.3 \times 12/6 \times 1/4 = 1.6$).

A supplemental monitoring program for sediments and mussels has been incorporated into the basic program (see notes f and g to Table 4.8.1) as a result of an agreement with the Massachusetts Wildlife Federation. This supplemental program is designed to provide information on radioactivity levels at substantially higher sensitivity levels in selected samples to verify the adequacy (or, alternatively, to provide a basis for later modifications) of the long-term marine sampling schedules. As part of the supplemental program, analysis of mussels for isotopes of plutonium will be performed if radiocesium activity should exceed 200 pCi/Kgm in the edible portions.

The 200 pCi/Kgm cesium "action level" is based on calculations which showed that if cesium from plant releases reached this level, plutonium could possibly appear at levels of potential interest.* The calculations also showed that the dose delivered from these levels of plutonium would not be a significant portion of the total dose attributable to liquid effluents.

The program was also designed to be consistent, wherever applicable with Regulatory Guide 4.8 (Issued for comment December 1975). The following exceptions to the generic recommendations stated in Regulatory Guide 4.8 are justified due to site specific considerations:

1. The required detection capability for I-131 in milk is about twice the value suggested in Regulatory Guide 4.8. The justification for the higher value is presented in the second paragraph of this section. This is a conservative estimate of the capability of the milk surveillance program to detect concentrations at the appropriate annual dose level since the annual dose is proportional to the annual average concentration in milk. The detection limit for a group of samples is less than that for a single sample and is inversely proportional to the square root of the number of samples. The conservatism in this case is approximately $\sqrt{12}$, or about a factor of 3.
2. Air particulates are not analyzed for radiostrontium. The program instead calls for this analysis in milk samples. This is justified because the air-cow-milk exposure pathway can be better monitored at Pilgrim after the very low level releases of radiostrontium are reconcentrated in cow's milk (Ref. 1).
3. Soils and sediments are not routinely analyzed for Sr-90, but rather the analysis is done on a contingency basis. The rationale behind this is that Sr-90 will not contribute to long-term radionuclide buildup until the more abundant gamma emitting nuclides appear in relatively large concentrations. Both Items 2 and 3 reflect the fact that in 3½ years of operation, Pilgrim Station liquid releases of Sr-90 have amounted to only 1/1000 of the Sr-90 inventory in Cape Cod Bay water (from weapons testing fallout) and about 4/100,000 of the direct deposition on the Bay. Also, gaseous releases of Sr-90 have been only 1/100,000 of the terrestrial Sr-90 inventory within five miles of the station (Ref. 1).
4. Surveys are conducted annually, to determine appropriate locations for sampling of leafy vegetables and milk. The objective of these surveys is to ensure that the environmental samples are representative of realistic food chain pathways, considering local conditions. Results of the monitoring program will be used as "benchmarks" to verify calculational models used to predict the consequences of effluent releases from the station. The models can then be employed to predict doses attributable to radiation deposition at any other location of interest. The combination of monitoring results and calculational model predictions is a practical method of demonstrating compliance with 10CFR50 Appendix I. This approach does not require (nor is it always practical) that environmental media always be sampled from the "worst case" locations; although sensitivity of the monitoring results might be improved by sampling from locations which are reasonably close to "worst case" conditions.

* in measurable quantities having a potential dose (human food chain) significance comparable to other nuclides if present at their detection limits.

Verification of the appropriate milk sampling locations on an annual basis is satisfactory as there are very few locations suitable for the grazing of dairy herds in the vicinity of the plant (Ref. 2). This situation makes it unlikely the location of the nearest dairy herd (3.5 miles-W) will change.

5. Annual sampling of beef forage (in place of beef) is adequate because beef cattle are not raised commercially in the vicinity of the site. However, dairy cows from the Plymouth County Farm are periodically sold for beef. Feed (hay) from this location will be sampled to monitor this potential pathway for ingestion of radioactivity. If beef cattle feeding on local forage are found at locations closer to the site, forage samples from the closer location will replace the sample from the County Farm.
6. Groundwater flow at the plant site is into Cape Cod Bay; therefore, terrestrial monitoring of groundwater is not included in this program.
7. Poultry sampling is not performed because poultry in Plymouth County feed almost exclusively on imported grain and are usually raised under shelter.
8. Field gamma isotopic surveys are conducted to monitor radioactivity in soil in lieu of laboratory analysis of soil samples. The technique has several advantages over laboratory analysis. First, analysis can be performed on the same plot of land from survey to survey, and radioactivity build-up at the location can be accurately determined. Secondly, gamma exposure rate is determined directly from this technique; hence compliance with 10CFR50 Appendix I levels can be investigated directly rather than indirectly through soil sampling.

References:

1. Wrenn, M.E., "Review of Sr-90 Releases from Pilgrim 1 Nuclear Plant and a Comparison with Extant Environmental Levels", 1976.
2. Pilgrim Station Unit #2 PSAR, Appendix 11F, pp. 11FC-11 and 11A, amended June 15, 1976.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.8.E Mechanical Vacuum Pump

1. The mechanical vacuum pump shall be capable of being isolated and secured on a signal of high radioactivity in the steam lines whenever the main steam isolation valves are open.
2. If the limits of 3.8.E are not met, the vacuum pump shall be isolated.

4.8.E Mechanical Vacuum Pump

At least once during each operating cycle verify automatic securing and isolation of the mechanical vacuum pump.

TABLE 4.8.1

OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

| <u>Exposure Pathway or Sample Type</u> | <u>Locations (Direction-Distance) from Reactor</u> | <u>Sampling and Collection Frequency</u> | <u>Type and Frequency of Analysis</u> |
|--|--|---|---|
| AIRBORNE | | | |
| Particulates | 11 (see Table 4.8.2) | Continuous sampling over one week | Gross beta radioactivity at least 24 hours after filter change. (a) Quarterly composite (by location) for gamma isotopic. (b) |
| Radioiodine | 11 (see Table 4.8.2) | Continuous sampling with canister collection weekly | Analyze weekly for I-131 |
| Soil | 11 (see Table 4.8.2) | Once per three years | Field gamma isotopic. (c)(1) |
| DIRECT | | | |
| | 20 (see Table 4.8.3) Plymouth Beach and Priscilla/White Horse Beach | Quarterly Annually (Spring) | Gamma exposure quarterly. (1) Gamma exposure survey (1) |
| WATERBORNE | | | |
| | Discharge Canal Bartlett Pond (SE-1.7 mi.) Powder Point (NNW-7.8 mi.)(d) | Continuous Composite Sample Weekly grab sample Weekly grab sample | Gamma isotopic (b) monthl and composite for H-3 analysis quarterly, (c). |
| AQUATIC | | | |
| Shellfish | Discharge outfall Duxbury Bay Manomet Pt. Plymouth or Kingston Harbor Marshfield (d) | Quarterly (at approximate 3-month intervals) | Gamma isotopic (b); also see note (f). |

TABLE 4.8.1
(Cont'd)

| <u>Exposure Pathway or Sample Type</u> | <u>Locations (Direction-Distance) from Reactor</u> | <u>Sampling and Collection Frequency</u> | <u>Type and Frequency of Analysis</u> |
|--|---|--|---|
| Irish Moss | Discharge outfall Manomet Pt. Ellisville (d) | Semi-annually | Gamma isotopic (b) |
| Lobster | Vicinity of discharge point Offshore (d) | Four times per season Once per season | Gamma isotopic (b) on edible portions, |
| Fish | Vicinity of discharge point Offshore (d) | Quarterly, Groups I and II (e) In season, Groups III and IV (e) Annually, each group | Gamma isotopic (b) on edible portions(e) |
| Sediments | Rocky Point Plymouth Harbor Duxbury Bay Plymouth Beach Manomet Pt. Marshfield (d) | Semi-annually | Gamma isotopic (b) (c), see also note (g) |
| INGESTION (Terrestrial) | | | |
| Milk | Plymouth County Farm (W-3.5 mi.)(h); Whitman Farm (NW-21 mi.) (d) | Semi-monthly during periods when animals are on pasture, other- wise monthly | Gamma isotopic (b) Sr-89, 90 monthly; radioiodine analysis all samples. |
| Cranberries | Manomet Pt. Bog (SE-2.6 mi.) Bartlett Rd. Bog (SSE/S-2.8 mi.) Pine St. Bog (WNW-17 mi.) (d) | At time of harvest | Gamma isotopic (b) on edible portions. |

TABLE 4.8.1
(Cont'd)

| <u>Exposure Pathway or Sample Type</u> | <u>Locations (Direction-Distance) from Reactor</u> | <u>Sampling and Collection Frequency</u> | <u>Type and Frequency of Analysis</u> |
|--|---|--|---|
| Tuberous and green leafy vegetables | Karbott Farm (SSE-2.0 mi.)(h) Bridgewater Farm (W-20 mi.) (d) | At time of harvest | Gamma isotopic (b) on edible portions. |
| Beef Forage | Plymouth County Farm (W-3.5 mi.) (h) | Annually | Gamma isotopic (b) |

Notes

- (a) If gross beta radioactivity is greater than 10 times the control value, gamma isotopic will be performed on the sample.
- (b) Gamma isotopic means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.
- (c) If integrated gamma activity (less K-40) is greater than 10 times the control value (less K-40), strontium-90 analysis will be performed on the sample.
- (d) Indicates control location.
- (e) Fish analyses will be performed on a minimum of 2 sub-samples, consisting of approximately 400 grams each from each of the following groups:

| I. Bottom Oriented | II. Near Bottom Distribution | III. Anadromous | IV. Coastal Migratory |
|---------------------|------------------------------|-----------------|-----------------------|
| Winter flounder | Tautog | Alewife | Bluefish |
| Yellowtail flounder | Cunner | Rainbow smelt | Atlantic herring |
| | Atlantic cod | Striped bass | Atlantic menhaden |
| | Pollock | | Atlantic mackerel |
| | Hakes | | |

- (f) Mussel samples from four locations (immediate vicinity of discharge outfall, Manomet Pt., Plymouth or Kingston Harbor, and Green Harbor in Marshfield) will be analyzed quarterly as follows:

One kilogram wet weight of mussel bodies, including fluid within shells will be collected. Bodies will be reduced in volume by drying at about 100°C. Sample will be compacted and analyzed by Ge(Li) gamma spectrometry or alternate technique, if necessary, to achieve a sensitivity** of 5 pCi/kg for Cs-134, Cs-137, Co-60, Zn-65 and Zr-95 and 15 pCi/kg for Ce-144.

The mussel shell sample from one location will be analyzed each quarter. One additional mussel shell sample will be analyzed semi-annually. Unscrubbed shells to be analyzed will be dried, processed, and analyzed similarly to the mussel bodies.

Because of the small volume reduction in pre-processing of shells, sensitivities attained will be less than that for mussel bodies. The equipment and counting times to be employed for analyses of shells will be the same or comparable to that employed for mussel bodies so that the reduction in sensitivities (relative to those for mussel bodies) will be strictly limited to the effects of poorer geometry related to lower sample volume reduction. Shell samples not scheduled for analysis will be reserved (unscrubbed) for possible later analysis.

**Sensitivity values are to be determined in accordance with a 95% confidence level on K_{α} ; 50% confidence level on K_{β} (See HASL-300 for definitions).

Notes (Cont'd)

If radiocesium (Cs-134 and Cs-137) activity exceeds 200 pCi/kg (wet) in mussel bodies, these samples will be analyzed by radiochemical separation, electrodeposition, and alpha spectrometry for radioisotopes of plutonium, with a sensitivity of 0.4 pCi/kg.

- (g) Sediment samples from four locations (Manomet Pt., Rocky Pt., Plymouth Harbor, and head of Duxbury Bay) will be analyzed once per year (preferably early summer) as follows:

Cores will be taken to depths of 30-cm, minimum depth wherever sediment conditions permit by a hand-coring sampling device. If sediment conditions do not permit 30-cm deep cores, the deepest cores achievable with a hand-coring device will be taken. In any case, core depths will not be less than 14-cm. Core samples will be sectioned into 2-cm increments, and surface and alternate increments analyzed, others reserved. Sediment sample volumes (determined by core diameter and/or number of individual cores taken from any single location) and counting technique will be sufficient to achieve sensitivities of 50 pCi/kg dry sediment for Cs-134, Cs-137, Co-60, Zn-65, and Zr-95 and 150 pCi/kg for Ce-144. In any case individual core diameters will not be less than 2 inches.

The top 2-cm section from each core will be analyzed for Pu isotopes (Pu-238, Pu-239, 240) using radiochemical separations, electrodeposition, and alpha spectrometry with target sensitivity of 25 pCi/kg dry sediment. Two additional core slices per year (mid-depth slice from two core samples) will be similarly analyzed.

- (h) These locations may be altered in accordance with results of surveys discussed in paragraphs 4.8.D-3 and 4.8.D-4.

- (i) Minimum sensitivities for gamma exposure measurements are as follows:

Field gamma isotopic - 1 uR/hr for K-40, U series, Th series, and CS-137.
Gamma exposure - 1 uR/hr average exposure rate.
Gamma exposure survey- 1 uR/hr exposure rate.

TABLE 4.8.2

AIR PARTICULATES, GASEOUS RADIOIODINE AND SOIL SURVEILLANCE STATIONS

| <u>Sampling Location</u> (<u>Sample Designation</u>) | <u>Distance and</u> <u>Direction from Reactor</u> |
|---|--|
| Offsite Stations | |
| East Weymouth (EW) * | 23 miles NW * |
| Plymouth Center (PC) | 4.5 miles W-WNW |
| Manomet Substation (MS) | 2.5 miles SE |
| Cleft Rock Area (CR) | 0.9 miles S |
| Onsite Stations | |
| Rocky Hill Road (ER) | 0.8 miles SE |
| Rocky Hill Road (WR) | 0.3 miles W-WNW |
| Overlook Area (OA) | 0.03 miles W |
| Property Line (PL) | 0.34 miles NW |
| Pedestrian Bridge (PB) | 0.14 miles N |
| East Breakwater (EB) | 0.35 miles ESE |
| Warehouse (WS) | 0.03 miles SSE |

* Control Station

TABLE 4.8.3

EXTERNAL GAMMA EXPOSURE SURVEILLANCE STATIONS (TLD)

| <u>Dosimeter Location (Designation)</u> | <u>Distance and Direction from Station</u> |
|---|--|
| Offsite Stations | |
| East Weymouth (EW)* | 23 miles NW * |
| Kingston (KS) | 10 miles WNW |
| Sagamore (CS) | 10 miles SSE-S |
| Plymouth Airport (SA) | 8 miles WSW |
| North Plymouth (NP) | 5.5 miles WNW |
| Plymouth Center (PC) | 4.5 miles W-WNW |
| South Plymouth (SP) | 3 miles WSW |
| Manomet (MS) | 2.5 miles SSE |
| Manomet (ME) | 2.5 miles SE |
| Manomet (MP) | 2.25 miles ESE-S |
| Cleft Rock Area (CR) | 0.9 miles S |
| Saquish Neck (SN)** | 4.6 miles NNW |
| Onsite Stations | |
| Rocky Hill Road (ER) | 0.8 miles SE |
| Microwave Tower (MT) | 0.38 miles S |
| Rocky Hill Road (WR) | 0.3 miles W-WNW |
| Rocky Hill Road (B) | 0.26 miles SSE |
| Property Line (H) | 0.21 miles SSW |
| Property Line (I) | 0.14 miles W |
| Public Parking Area (PA) | 0.07 miles N-NNE |
| Overlook Area (OA) | 0.03 miles W |

* Control Station

**TLD's for this location will be provided to a third party and will be analyzed for gamma exposure whenever returned to BECo.

TABLE 4.8.4

DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS (d)

| Analysis | Lower Limit of Detection (a) | | | | |
|------------|------------------------------|---|----------------------|----------------------|---------------|
| | Water pCi/l | Airborne particulate or gas - pCi/M ³ | Wet solids pCi/Kg | Dry solids pCi/Kg | Milk pCi/l |
| Gross beta | 2 | 1 x 10 ⁻² | | | |
| H-3 | 330 | | | | |
| Mn-54 | 15 | | 130 | 60 | |
| Fe-59 | 30 | | 260 | 120 | |
| Co-58,60 | 15 | 2 x 10 ⁻² | 130 | 60 | |
| Zn-65 | 30 | | 260 | 120 | |
| Sr-89 | 10 | | 40 | | 10 |
| Sr-90 | 2 | | 8 | 150 | 2 |
| Zr/Nb-95 | 10 | | | | |
| I-131 | | 7 x 10 ⁻² | 80(b) | | 1.5 (c) |
| Cs-134,137 | 15 | 1 x 10 ⁻² | 80 | 150 | 15 |
| Ba/La-140 | 15 | | | | 15 |

(a) The nominal lower limits of detection at the 95% confidence level (defined in the ERDA Health and Safety Laboratory procedures manual, HASL-300).

(b) Applies only to analysis of green leafy vegetables.

(c) Sensitivity with 25% error at the 95% confidence level.

(d) This table applies to all analyses other than those for which higher sensitivities apply in accordance with Notes (f) and (g) to Table 4.8.1.

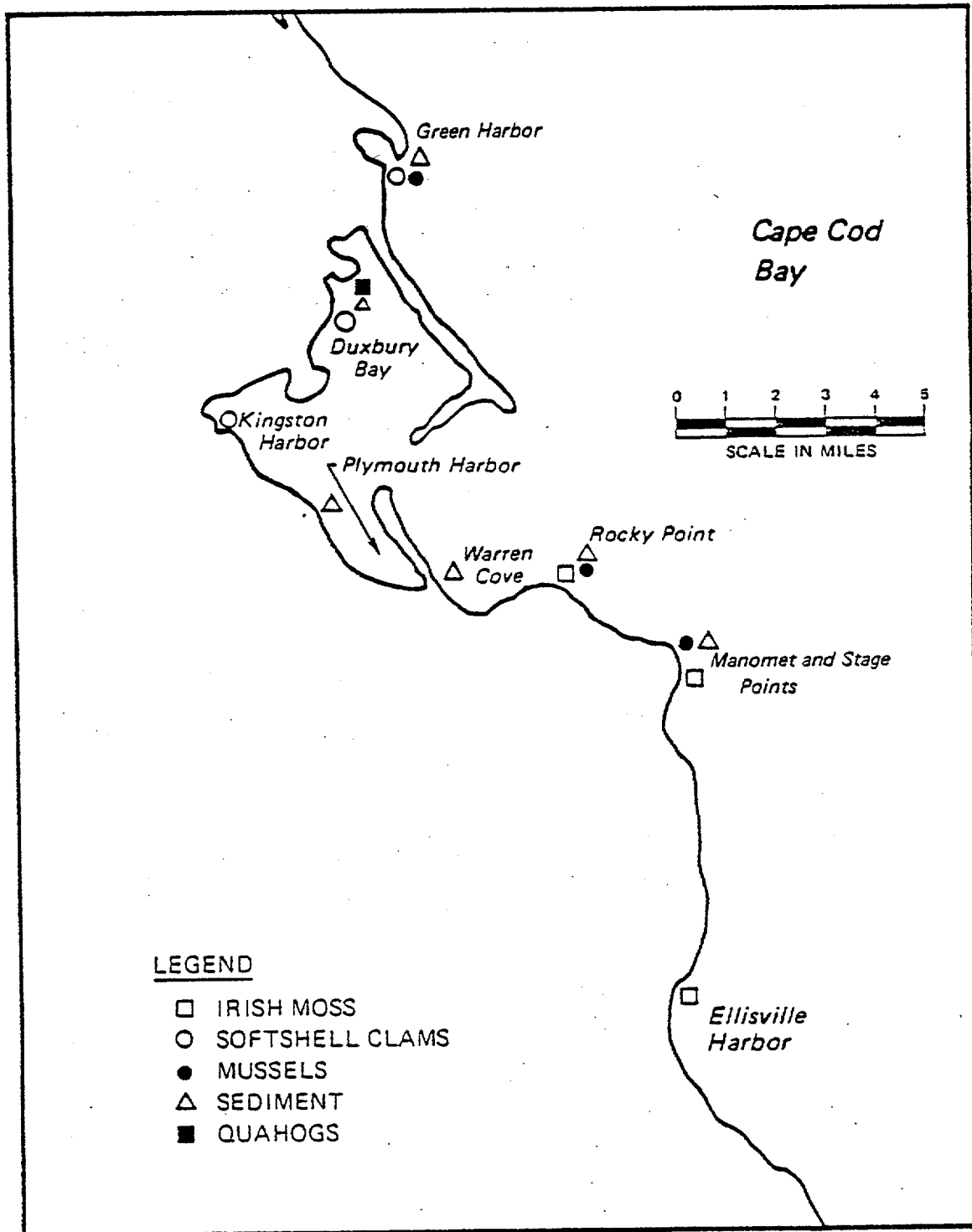
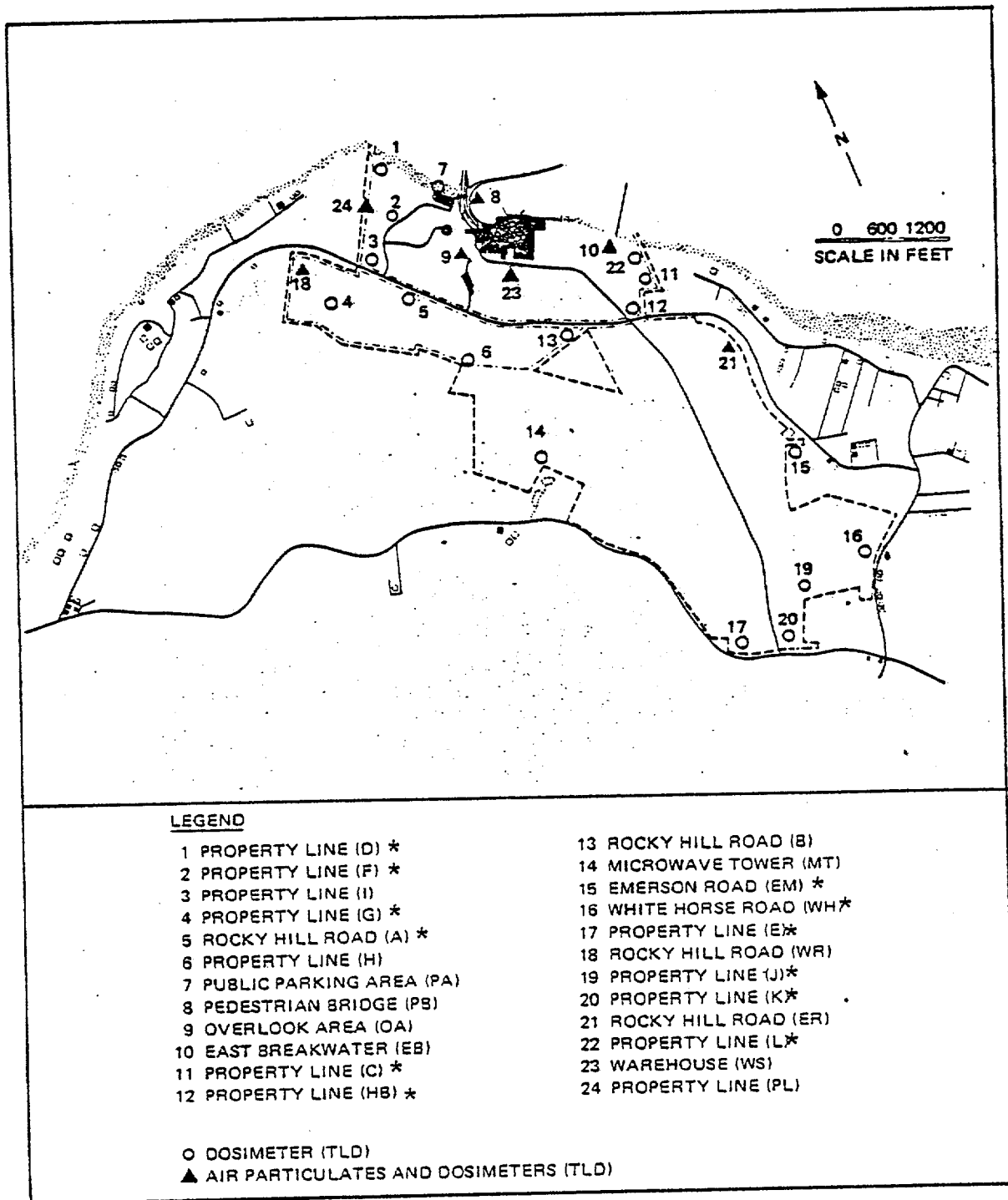
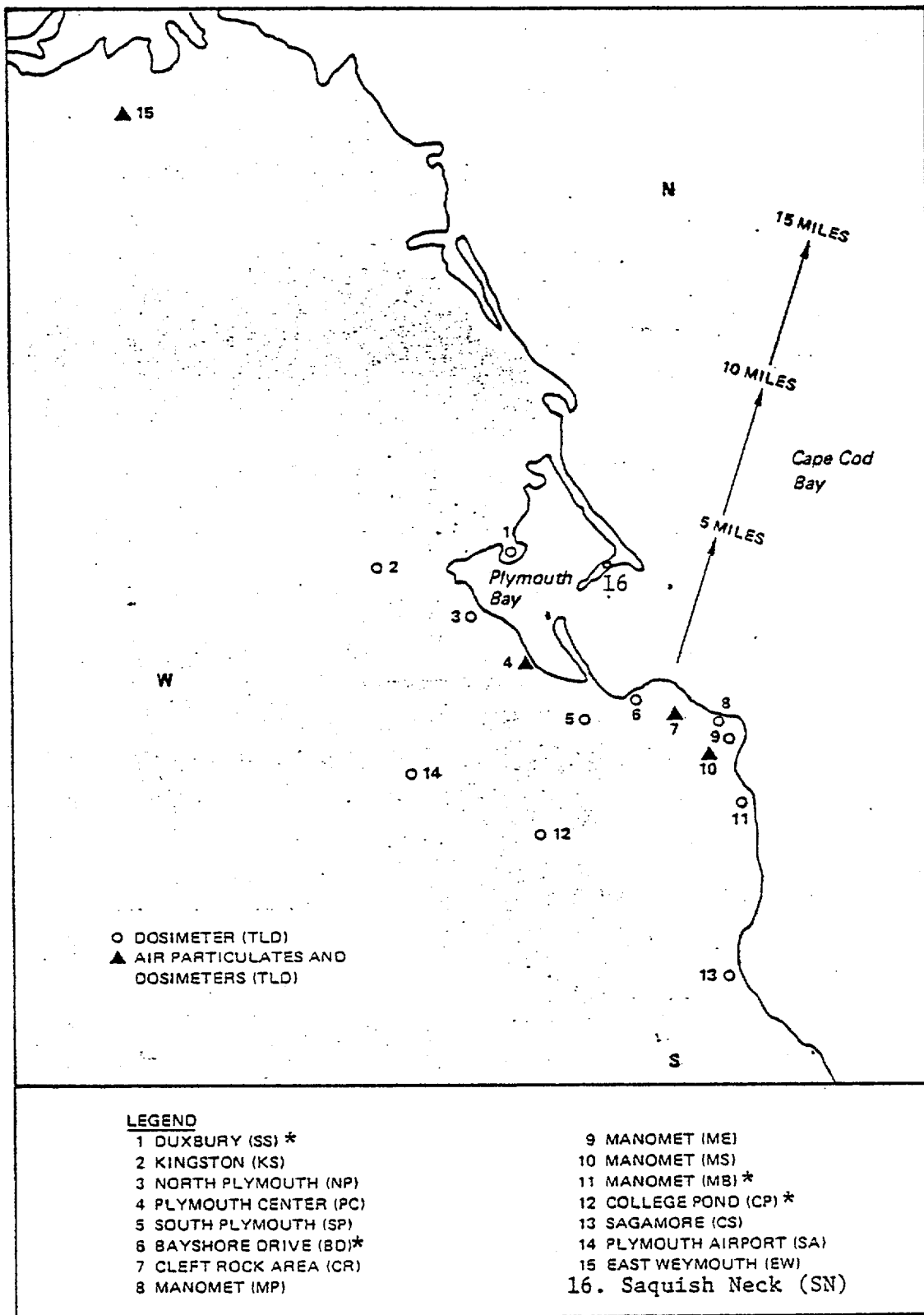


Figure 4.8-1 Typical Mollusc, Algae and Sediment Sampling Stations



*additional station not required by Specification 4.8.D.1

Figure 4.8.2 Location of Onsite Monitoring Stations



*additional stations not required by Specification 4.8.D.1

Figure 4.8.3 Location of Offsite Monitoring Stations

BASES:

3.8 and 4.8 Objective:

It is expected that releases of radioactive material in effluents will be kept at small fractions of the limits specified in Section 20.106 of 10 CFR, Part 20. Consistent with this objective, operating procedures shall be developed and used, and equipment which has been installed to maintain control over radioactive materials in gaseous and liquid effluents produced during normal reactor operations, including expected operational occurrences, shall be maintained and used, to keep levels of radioactive material in effluents released in unrestricted areas as low as practicable.

At the same time the licensee is permitted the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided a dependable source of power even under unusual operating conditions which may temporarily result in releases higher than such small fractions, but still within the limits specified in Section 20.106 of 10 CFR, Part 20. It is expected that in using this operational flexibility under unusual operating conditions the licensee will exert his best efforts to keep levels of radioactive material in effluents as low as practicable.

C. Unique Reporting Requirements

1. Radioactive Effluent Release Report

A report shall be submitted to the Commission within 60 days after January 1 and July 1 of each year specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents during the previous 6 months. The format and content of the report shall be in accordance with Regulatory Guide 1.21 (Revision 1) dated June 1974.

2. Environmental Program Data

- a. Annual Report. A report on the radiological environmental surveillance program for the previous 12 months of operation shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) as a separate document within 90 days after January 1 of each year. The reports shall include summaries, interpretations, and statistical evaluation of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of any land use surveys which affect the choice of sample locations. If harmful effects or evidence of irreversible damage are detected by the monitoring, the licensee shall provide an analysis of the problem and a proposed course of action to alleviate the problem.

Results of all radiological environmental samples shall be summarized and tabulated on an annual basis. In the event that some results are not available within the 90-day period, the report shall be submitted, noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

- b. Anomalous measurement report. If radioactivity in an indicator medium from an off-site location is found and confirmed at a level exceeding ten times the control station value, a written report shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) within 10 days after confirmation.** This report shall include an evaluation of any release conditions, environmental factors, or other aspects necessary to explain the anomalous result.

** A confirmatory reanalysis of the original, a duplicate, or a new sample may be desirable, as appropriate. The results of the confirmatory analysis shall be completed at the earliest time consistent with the analysis, but in any case within 30 days of receipt of the anomalous result.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-293

BOSTON EDISON COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 23 to Facility Operating License No. DPR-53, issued to Boston Edison Company (the licensee), which revised Technical Specifications for operation of the Pilgrim Nuclear Power Station (the facility) located near Plymouth, Massachusetts. The amendment is effective as of its date of issuance.

This amendment replaces, in its entirety, the existing Pilgrim Unit No. 1 Environmental Monitoring Program, contained in Technical Specification Section 4.8 by a new Environmental Monitoring Program developed by Boston Edison. The new program has been reviewed by the staff against the Commission's guidance contained in Nuclear Regulatory Commission Regulatory Guide 4.8 "Environmental Technical Specifications for Nuclear Power Plant".

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated October 7, 1976, and a supplement thereto dated December 28, 1976, and (2) Amendment No. 23 to License No. DPR-53. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Plymouth Public Library on North Street in Plymouth, Massachusetts 02360. A single copy of item (2) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 19th day of April, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

April 15, 1977

Note to Paul O'Connor, Project Manager, Pilgrim Unit No. 2

Re: Concurrence on Amendment to Pilgrim Unit 1 Environmental
Monitoring Program

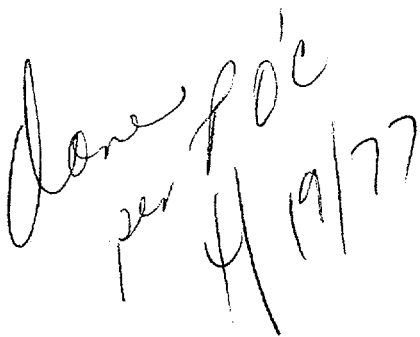
I concur in the amendment of the Pilgrim Unit 1 environmental monitoring program subject to the conditions described below.

The amendments to the Pilgrim 1 operational environmental monitoring program will become the preoperational program for the proposed Pilgrim Unit 2. As you know, the changes to the Unit 1 environmental monitoring program stem from the Staff's recommendation that these changes be made in order that Pilgrim Unit 1 be in accord with Regulatory Guide 4.8 and pursuant to an agreement between the Massachusetts Wildlife Federation and Boston Edison. As we agreed, it would be beneficial for future amendments of this nature that the Staff recognize in its cover letter to the Applicant that these changes stem from the requirements of NRC Regulatory Guide 4.8 and incorporate additional monitoring requirements, which are consistent with Regulatory Guide 4.8, that are a result of an agreement between Boston Edison and the Massachusetts Wildlife Federation.

As you know, we received a request from the licensee that the footnote, denoted by a double asterisk, on page 187 of the technical specification reflect the fact that the TLD's will be given to a third party rather than residents of Saquish Neck.



Barry H. Smith
Attorney, OELD



Done per 4/19/77