APPENDIX A

TO

FACILITY OPERATING LICENSE DPR-35

TECHNICAL SPECIFICATION AND BASES

FOR

PILGRIM NUCLEAR POWER STATION -.

PLYMOUTH, MASSACHUSETTS

BOSTON EDISON COMPANY

DOCKET NO. 50-293

9 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, ¥) and Ba-La-140 and I-131 (particulate).

- 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 radiosctivity 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 3.8.8.3 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.
- 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.

D. Environmental Monitoring Program

An environmental monitoring program shall be conducted as follows:

1. Atmospheric Environment

- a. Radioactive particulates and gaseous iodine will be monitored by air samplers stationed at the seven locations shown in Table 4.8.1A. It is planned that filters will be collected weekly from each station and analyzed as shown in Table 4.8.3.
- b. External gamma exposure will be monitored by means of thermoluminescent dosimeters stationed at the nineteen locations shown in Table 4.8.18.

Every month the dosimeters will be exchanged with ones that have been recently annealed, and the exposure rate at each location for the month will be determined.

2. Aquatic Environment

- a. Domestic water samples will be collected monthly from the locations shown in Table 4.8.2A. Each sample will be analyzed as shown in Table 4.8.3.
- b. Sampling of the discharge canal and intake area will be made in such a manner as to collect monthly and quarterly composites from these locations. During the months of June, July and August, samples of seawater will be collected monthly off the beaches southeasterly of the plant. Seawater samples will be analyzed as shown in Table 4.8.3.

3.8.D Environmental Monitoring Program (Cont'd)

4.8.D Environmental Monitoring Program (Cont'd)

- c. Samples of marine life indigenous to the area of Pilgrim Station will be collected during their commercial harvesting seasons when they are most readily available. Samples will include lobster (May through October), flounder (November or December), and Irish Moss (May through September). Edible molluscs will be collected during summer months if any can be found within three miles of the station. Each sample will be analyzed as shown in Table 4.8.3.
- d. Bottom sediment samples will be collected semiannually from an area in the vicinity of the discharge canal outfall. Each sample will be analyzed as shown in Table 4.

3. Terrestrial Environment

- a. Milk samples will be collected monthly from the locations shown in Table 4.8.2.B and analyzed as shown in Table 4.8.3.
- b. Samples of cranberries and other crops having commercial significance will be collected annually during their harvesting seasons from the locations as shown in Table 4.8.2.B. Each sample will be analyzed as shown in Table 4.8.3.

3.8.E Mechanical Vacuum Pump

- 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.

PNPS - ENVIRONMENTAL MONITORING PROGRAM TABLE 4.8.1A

Air Particulates and Gaseous Iodine Surveillance Stations
* indicates Control Station

Location

East Weymouth*
Plymouth Center
Manomet Substation
Cleft Rock Area
Rocky Hill Road
Rocky Hill Road
Public Access Area

Distance and Direction from Station

23 miles NW
4.5 miles W-WNW
2.5 miles SSE
0.9 miles 5
Onsite
Onsite W-WNW
Onsite

TABLE 4.8.1B EXTERNAL GAMMA EXPOSURE SURVEILLANCE STATIONS

Location

East Weymouth*
Kingston*
Sagamore*
Plymouth Airport*
North Plymouth
Plymouth Center
South Plymouth
Manomet
Manomet
Manomet
Cleft Rock Area
Rocky Hill Road
Rocky Hill Road

Public Access Area
Public Access Area
Property Line
Property Line
Rocky Hill Road
Microwave Tower

Distance and Direction from Station

23 miles NW
10 miles WNW
10 miles CSE-S
8 miles WSW
5.5 miles WNW
4.5 miles W-WNW
3 miles WSW
2.5 miles SE
2.5 miles SSE
2.25 miles ESE-SE
0.9 miles S
0.8 miles SE
0.3 miles W-WNW

Onsite S Onsite N-NNE Onsite W Onsite SSV Onsite SSE Onsite S

PNPS - ENVIRONHENTAL MONITORING PROGRAM TABLE 4.8.2A

AQUATIC SURVEILLANCE STATIONS

*Indicates Contro	1 Station	
Sample Type	Sample Location	Distance and Direction from Station
Domestic Water	Deep Water Pumping Station (Lout Pond Well and Little South Pond) - Plymouth	4.75 miles W
	Warner's Pond Pumping Sta- tion (Manomet Well) - Manomet	2.75 miles SSE
	Great Pond Pumping Station (Great Pond - South Weymouth*)	24 miles WNW - NW
Sea Water	Discharge Canal	Onsite
	Cooling Water Intake	Onsite
	Priscilla Beach	0.8 to 1.6 miles ESE-SE
	White Horse Beach	1.6 to 2.7 miles ESE-SE
Marine Life	Area surrounding the station	Sampling ranges from 2.4 miles W-WNW to 2.9

TABLE 4.8.2B TERRESTRIAL AVEILLANCE STATIONS

Area in vicinity of discharge

canal outfall

Bottom Sediment

ofles ESE-SE

Sample Type	Sample Location	Distance and Direction from Station
Milk	Plymouth Hingham*	3.5 miles W 24 miles NW
Cranberries	Manomet Manomet Manomet	2 miles S 2 miles SSE 2.4 miles SE 2.75 miles SSE-S
Crops (Potatoes, Cabbage, Lettuce and Hay)	Plymouth	3.5 miles W

PNPS - ENVIRONMENTAL MONITORING PROGRAM TABLE 4.8.3 TYPES AND FREQUENCIES OF ANALYSES

Sample Type	Analysis	Frequency of Analysis
Air Particulates	Gross Beta	Weekly
	Gross Gamma on filter composites from each station Gamma Spectrum Iodine - 131	Monthly (1) Weekly
Gaseous Iodine	Iodine - 131	Weekly
Gamma Exposure	Dosimeter reading	Monthly
Domestic Water	Gross Beta and Gross Gamma Gamma Spectrum I-131, Sr-90, H-3	Monthly (1) Monthly
Sea Water	Fractional Gross Beta and Gross Gamma Gamma Spectrum Iodine - 131 Sr-90, Cs-137, H-3, Mn-54, Zn-65, Co-58 and 60	Monthly Monthly Quarterly
Marine Life	Gross Beta and Gross Gamma Gamma Spectrum I-131, Sr-90, Cs-137, Mn-54, Zn-65, Co-58 and 60	Each Sample (2) Each Sample
Bottom Sedimen	Gross Beta, Gross Gamma and Gamma Spectrum	Semi-Annually
Milk	I-131, Sr-90, Cs-137, Ba/La-140	Monthly
Crops	Gross Beta, Gross Gamma and Gamma Spectrum Sr-90, Cs-137	Annually Annually

Notes for Table 4.8.3

- (1) Selective gamma analysis will be made based upon gross gamma results, with at least one gamma spectrum analysis made each quarter.
- (2) A gamma spectrum analysis will be made at least once during each sampling period.

Planned

BASES:

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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 or 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 capendable 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.

Policy Issue 7: MONITORING AND SURVEILLANCE OF FACILITIES

Objective: To determine the roles of Federal agencies, State governments, and non-Federal groups in monitoring and surveillance of Federal and non-Federal facilities that use or produce radioactive materials where the potential exists for releases of radioactive material to the environment.

Discussion: Although many agencies have responsibilities for the monitoring and surveillance of Federal and independent facilities, there is concern that these responsibilities are not fully coordinated or used efficiently. Agencies are involved in a variety of monitoring and surveillance activities such as: making measurements, developing radiation detection devices and measurement protocols, overseeing measurement activities of facility operators, certification, and instrument calibration. Yet there is no overall policy regarding the monitoring and surveillance of these facilities.

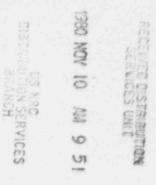
Among the specific topics to be addressed are:

- Should independent monitoring be carried out in Federal facilities and/or non-Federal facilities? If the measurements are made by the facility operator, should there be active independent oversight or surveillance of the monitoring? Should the Federal government develop a broad set of quality assurance guidelines to be used where there is not independent monitoring?
- Should all occupational monitoring of Federal facilities be conducted by OSHA? Would OSHA have the capability to carryout the monitoring or oversight of monitoring activities?
- Should EPA or another Federal agency coordinate a nationwide environmental radiation monitoring program and provide funds, guidance and technical assistance to the States for it? If so, what should be the characterics of the program.
- What role, if any, should States and non-governmental public groups have in monitoring and surveillance activities of Federal facilities or Federally regulated facilities.



NUCLEAR REGULATORY COMMISSION WASHINGTON, D. C. 20555

NOV 6 19:10



The Honorable Gerry E. Studds United States House of Representatives Washington, D. C. 20515

Dear Congre.sman Studds:

Thank you for forwarding to us the inquiry from your constituent, William A. Caswell, concerning monitoring the radiation received by residents living near nuclear power plants. While it appears that Mr. Caswell's principal concern is measuring radioactivity levels in the body, radiation is also received from radioactive materials external to the body. In fact, in most instances, external radiation exposure is the greatest contributor to the dose received by individuals.

There is no simple, inexpensive device which would monitor the internal radioactivity levels in residents living near nuclear power plants. Past experience has shown that emissions of radioactive materials from the routine operation of nuclear power reactors are generally too low to result in any measurable increase in the internal radioactivity levels of nearby residents. Internal levels of certain radioactive materials can be monitored by measuring radiation emitted from within the body by a technique known as whole-body counting, requiring sophisticated, expensive instruments. Such monitoring was done on approximately 750 residents living within three miles of the Three Mile Island Nuclear Station following the March 28, 1979 accident. No abnormal radioactivity levels attributable to radionuclides from either the accident or the normal operation or the Three Mile Island plant were found.

There are relatively inexpensive devices that can be used to monitor radiation doses from external sources such as noble gases and other radionuclides. These devices, called thermoluminescent dosimeters (TLD's), are used in the vicinity of nuclear power stations, such as the Pilgrim Nuclear Power Station, to measure radiation levels around the facility. In addition to the thermoluminescent dosimeters placed by licensees, subsequent to the TMI-2 accident the NRC also has increased the number of TLD's that it has placed around operating nuclear reactors, including the Pilgrim site.

Rather than monitor individual residents, we require nuclear reactor licensees to monitor effluents, both prior to release and during release. We also require environmental surveillance programs to measure external doses and the radioactivity levels in air, water, and foods. A copy of the effluent

and environmental surveillance requirements for the Pilg im Nuclear Power Station is enclosed. The results obtained from the environmental surveillance program would be available in the local public document room. The local public document room for the Pilgrim Nuclear Station is located at:

> Plymouth Public Library North Street Plymouth, Massachusetts 02360 617-746-1923

Mr. Caswell might also be interested in knowing that the issue of radiation monitoring around nuclear facilities is one of the agenda topics for the Federal Radiation Policy Council. A statement of the issues that will be considered in this regard is enclosed. If Mr. Caswell wishes to provide comments to the Radiation Policy Council he may send them to:

> Mr. Carl R. Gerber, Executive Director Radiation Policy Council Staff c/o Office of Science and Technology Policy Executive Office of the President New Executive Office Building Room 3105 Washington, D. C. 20500.

> > Sincerely,

For William J. Dircks
Executive Director for Operations

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Enclosures:

1. Portions of Pilgrim Technical Specifications (2 copies)

2. RPC Agenda Item

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3.8.D Environmental Monitoring Program (Cont'd)

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TABLE 4.8.1B EXTERNAL GAMMA EXPOSURE SURVEILLANCE STATIONS

Location

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Plymouth Airport*
North Plymouth
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South Plymouth
Manomet
Manomet
Manomet
Cleft Rock Area
Rocky Hill Road
Rocky Hill Road

Public Access Area Public Access Area Froperty Line Property Line Rocky Hill Road Microwave Tower

Distance and Direction from Station

23 miles NW
10 miles WNW
10 miles SSE-S
8 miles WSW
5.5 miles WNW
4.5 miles W-WNW
3 miles WSW
2.5 miles SE
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2.25 miles ESE-SE
0.9 miles S
0.8 miles SE
0.3 miles W-WNW

Onsite N-NNE Onsite W Onsite SSW Onsite SSE Onsite S

Onsite S

FNPS - ENVIRONHENTAL MONITORING PROGRAM TABLE 4.8.2A

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	Cooling Water Intake	Onsite
	Priscilla Beach	0,8 to 1.6 miles ESE-SE
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Marine Life	Area surrounding the station	Sampling ranges from 2.4 miles W-WNW to 2.9 miles ESE-SE
Bottom Sediment	Area in vicinity of discharge	

TABLE 4.8.2B TERRESTRIAL SURVEILLANCE STATIONS

canal outfall

Sample Type	Sample Location	Distance and Direction from Station
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Sample Type	TYPES AND FREQUENCIES OF ANALYSES Analysis	Planned Frequency of Analysis
		Weekly
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Gaseous Iodine	Iodine - 131	Weekly
Gamma Exposure	Dosimeter reading	Monthly
Domestic Water	Gross Beta and Gross Gamma Gamma Spectrum I-131, Sr-90, H-3	Monthly (1) Monthly
Sea Water	Fractional Gross Beta and Gross Gamma Gamma Spectrum	Monthly
	Todine - 131 Sr-90, Cs-137, H-3, Mn-54, Zn-65, Co-58 and 60	Monthly Quarterly
Marine Life	Gross Beta and Gross Gamma Gamma Spectrum	Each Sample (2)
	I-131, Sr-90, Cs-137, Mn-54, Zn-65, Co-58 and 60	Each Sample
Bottom Sediment	Gross Beta, Gross Gamma and Gamma Spectrum	Semi-Annually
Milk	I-131, Sr-90, Cs-137, Ba/La-140	Monthly
Crops	Gross Beta, Gross Gamma and Gamma Spectrum Sr-90, Cs-137	Annually Annually

Notes for Table 4.8.3

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BASES:

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- What role, if any, should States and non-governmental public groups have in monitoring and surveillance activities of Federal facilities or Federally regulated facilities.