



**Boston Edison**

Pilgrim Nuclear Power Station  
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General Manager - Technical Section

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BECO Ltr. #96-096

NPDES Programs (SPA)  
U.S. Environmental Protection Agency  
P.O. Box 8127  
Boston, MA 02114-8127

1997 ENVIRONMENTAL MONITORING PROGRAMS AND PLANS

Gentlemen:

In accordance with NPDES Permit No. MA0003557 (Federal) and No. 359 (State) for Pilgrim Station, the attached 1997 Environmental Monitoring, Thermal Discharge Fish Surveillance, and Dissolved Nitrogen Saturation Reduction Programs and Plans are submitted by Boston Edison Company for your approval.

This submittal is made in accordance with Part 1, Paragraph 8d of the above-referenced permit. These programs and plans have been recommended by the Pilgrim Administrative-Technical Committee to replace the 1996 environmental program.

If there are any questions concerning the attached programs and plans, please do not hesitate to call Mr. Robert Anderson (508-830-7935).

H. V. Oheim  
General Manager - Technical

RDA/nas/radmisc/96Monit

Attachment: Marine Ecology Monitoring Related to Operation of Pilgrim Station  
Unit 1, NPDES Permit Programs

cc: U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

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MARINE ECOLOGY MONITORING  
RELATED TO OPERATION OF PILGRIM STATION UNIT 1  
NPDES PERMIT PROGRAMS

In accordance with NPDES Permit requirements for Pilgrim Station Permit No. MA0003557 (Federal) and No. 359 (State), the following modified programs are presented for 1997. The 1978 through 1996 programs were submitted to the U.S. Environmental Protection Agency (EPA) and Mass. Department of Environmental Protection (DEP), in December 1977 through December 1995, respectively.

I. ENVIRONMENTAL MONITORING

The Environmental Monitoring Program represents a continuation of previous monitoring with changes made based on latest results and analyses. Pre-operational studies for Pilgrim Unit 1 commenced in 1969, almost four years before initial operation in December 1972. In accordance with environmental monitoring and reporting requirements of the Unit 1 Operating License, DPR-35, issued by the U.S. Atomic Energy Commission (now the Nuclear Regulatory Commission), Boston Edison carried out a post-operational Marine Ecology Program. This program was designed to investigate the Cape Cod Bay ecosystem, with emphasis on the Rocky Point area, to determine whether the operation of Pilgrim Station resulted in measurable effects on the marine ecology and to evaluate the significance of any such effects. The Marine Ecology Program for Unit 1 continued for five years from initial full power operation (that is, through December 1977) and was replaced by this NPDES Permit Program (with NRC concurrence). Amendment #67 (1983) to the PNPS Technical Specifications deleted Appendix B non-radiological water quality requirements since they were incorporated in the NPDES Permit. The post-operational monitoring for Pilgrim Unit 1 and the collected data are incorporated and analyzed in the Marine Ecology Semi-Annual Reports (#1-48), Marine Ecology Final Report (1978), and the Section 316 Demonstration Document (1975) and Supplement (1977) pursuant to the Federal Water Pollution Control Act Amendments of 1972.

The NPDES Program includes the following elements:

A. Pilgrim Administrative - Technical Committee

The Pilgrim Administrative - Technical Committee (PATC) is an advisory committee that was established to ensure the Pilgrim marine studies have the benefit of qualified, outside scientific and technical advice and are responsive to regulatory agency concerns. The PATC recommends improvement to ongoing monitoring based on the latest results with the approval of the U.S. EPA and Mass. Department of Environmental Protection. It has held 86 regular meetings since July 16, 1969 and will continue to be involved in future Pilgrim marine monitoring.

The PATC is composed of representatives (technical and administrative) from each interested federal and state regulatory agency, Boston Edison Company and the University of Massachusetts.

The present membership is as follows:

Agency

National Marine Fisheries Services - (1 member)

Mass. Department of Environmental Protection- (2 members)

U. S. Environmental Protection Agency - (3 members)

Mass. Division of Marine Fisheries - (2 members)

Mass. Office of Coastal Zone Management - (1 member)

University of Massachusetts - (1 member)

Boston Edison Company - (1 member)

Each meeting in 1996 was chaired by a representative of the Mass. Department of Environmental Protection. Minutes of PATC meetings appear in the semi-annual Pilgrim Station marine ecology reports.

B. Marine Fisheries Monitoring (Mass. Div. of Marine Fisheries)

The Division of Marine Fisheries (DMF), an agency of the Commonwealth of Massachusetts, conducts field monitoring pertinent to Pilgrim Station. The efforts listed below will be conducted in 1997.

Fish

As in 1996, Marine Fisheries studies in 1997 will focus on cunner recruitment (Summer/Fall) and winter flounder population parameters (Winter/Spring) to develop an understanding of PNPS impact on each of these two indicator species. Population estimates, fecundity estimates/ichthyoplankton dispersal studies, and adult equivalency analyses will be conducted on these two key species to help assess the impact of PNPS entrainment. Both species will be sampled and studied by a variety of techniques including trawling, trapping, diving and tagging. The smelt spawning habitat will be enhanced to improve population productivity through egg survivability in the Jones River (Kingston, MA) in March/April 1997 to mitigate effects of large impingements of rainbow smelt on Pilgrim Station's intake screens in recent years.

Finfish observational dive surveys will continue in 1997 for the Pilgrim Station thermal plume area. This monitoring will involve periodic diving from May through October to document fish behavior and condition at various stations in close proximity to the discharge canal, and two discharge area dives in late December to record any heated water overwintering fishes.

### Gas Saturation

In 1997, saturated gas analyses will be conducted during any periods of potential discharge-related mortalities. A Weiss satumeter will be used in situ to measure total partial pressure of dissolved gases and percent saturation of total gas, nitrogen, and oxygen.

#### C. Impingement Monitoring (Marine Research, Inc./BECO)

The main objective of the impingement study is to calculate impingement rates of marine organisms by gathering and analyzing data on numbers and species carried onto the four intake traveling screens at Pilgrim Station. In 1997, the weekly collection time will be twenty-four hours (three 8-hour periods). Supplemental initial fish survival data and reimpingement data, if possible, will also be recorded. BECO will analyze the data and prepare the reports.

#### D. Benthic Monitoring (ENSR Consulting & Engineering)

Transect monitoring to record benthic species and map the extent of Irish moss stunted and denuded areas immediately off the discharge canal will continue 4 times a year (March, June, September, and December) in 1997.

#### E. Entrainment Monitoring (Marine Research, Inc.)

As in 1996, entrainment monitoring in 1997 will emphasize consideration of ichthyoplankton, particularly winter flounder and cunner.

The 1997 entrainment studies will consist of routine monitoring of the Pilgrim discharge. This monitoring will be on a three times per week basis from March through September, and three times biweekly from October until February. If exceptionally high egg or larvae concentrations are found in the discharge when compared with previous years, steps may be taken to implement contingency ichthyoplankton sampling plans to assess the magnitude of the high concentrations. The plans will consist of additional tows and sample analysis from the discharge canal. MRI will analyze the data and prepare the reports including adult equivalency impact analyses for some of the more abundant species entrained.

#### F. Reporting of Environmental Monitoring

Semi-annual and annual reports with results of the above (items A-E) will be submitted to the EPA and DEP by October 31, 1997, and April 30, 1998, covering the periods January-June and January-December 1997, respectively. Mass. DMF will prepare a final project report for the commercial lobster pot study, which was completed in 1993.

## II. THERMAL DISCHARGE FISH SURVEILLANCE

For 1997, as in 1996, the Pilgrim Administrative - Technical Committee has recommended removing the PNPS discharge canal, barrier net on an experimental basis (to be reviewed annually). A net will be available for installation should any related fish incident warrant it.

The Thermal Discharge Fish Surveillance Program for Pilgrim Station will involve frequent visual inspections of the discharge canal during periods of fish migration to determine fish presence and condition. Also, diver observation in the plume area will be conducted from May through October and in December by Massachusetts Division of Marine Fisheries personnel as part of the Environmental Monitoring Program.

The observation and inspection elements of the Surveillance Program monitor compliance with the NPDES Permit by providing a check on fish in the discharge canal. These elements indicate when fish susceptible to gas bubble disease mortality are within or sufficiently near the Pilgrim Station discharge to warrant action to reduce surface nitrogen saturation level to less than 115% (as indicated by gas saturation analyses) and/or install the fish barrier net.

## III. DISSOLVED NITROGEN SATURATION REDUCTION

The plan for reducing dissolved nitrogen surface saturation levels to less than 115% in the discharge canal will involve a power reduction or outage should a school of fish susceptible to gas bubble disease mortality be in the immediate vicinity of Pilgrim Station. The procedure for determining the need, feasibility, and request for a power reduction or outage is as follows:

- A. Responsible regulatory/agency personnel familiar with fishery statistics (e.g., Mass. Division of Marine Fisheries) will estimate the magnitude of the fish school and, based on measured water quality and other pertinent environmental data, make a determination as to the likelihood and effect of a gas bubble disease mortality. They will also determine the potential necessity for a nitrogen saturation reduction and notify Boston Edison of this initial judgment.
- B. Boston Edison will notify the appropriate regional power authorities of the possibility of a power reduction and obtain projections through at least the upcoming weekend. Boston Edison will transmit load information to the agencies/persons taking the actions identified in item A above.
- C. On the basis of this information, agency personnel will formulate specific recommendations to the EPA Regional Administrator and/or the Mass. DEP, Office of Watershed Management (OWM) or their designees, on the timing and duration of a power reduction that is, in their judgment, appropriate and in the overall public interest.
- D. Responsible regulatory personnel will request a power reduction through a telephone call to Boston Edison, Pilgrim Nuclear Power Station Vice President of Nuclear Operations.
- E. Boston Edison personnel will record results of periodic surveillance of the condition and location of the fish prior to and subsequent to any station operational changes.