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U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

11/14/06  
71 FR 19504 (7)

RE: Scoping Comments in Response to the Notice of Intent to Prepare an Environmental Impact Statement (EIS) for the Pilgrim Nuclear Power Station in Plymouth, Massachusetts

Dear Sir/Madam:

In accordance with the United States Environmental Protection Agency's (EPA) responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, EPA Region I submits the following scoping comments to assist the United States Nuclear Regulatory Commission (NRC) in developing an Environmental Impact Statement (EIS) to support its proposed License Renewal for the Pilgrim Nuclear Power Station in Plymouth, Massachusetts (Pilgrim Station). The NRC administers this licensing process under the Atomic Energy Act and NRC regulations. According to the NRC's scoping notice, Entergy Nuclear Operations, Inc. (Entergy or the applicant) has requested a 20-year renewal of the facility operating license (extending the license to 2032) for Pilgrim Station.

Our expectation is that the NRC's EIS will assess environmental impacts and reasonable alternative courses of action related to the substantive issues regulated by the NRC under the Atomic Energy Act and NRC regulations. These include matters such as safety, radionuclide discharges or emissions to the environment, waste management, and others. EPA's EIS scoping comments focus on environmental issues related to areas for which we have regulatory responsibility and/or substantive expertise. Our comments are informed by several factors, including the following:

- information provided during several meetings with NRC staff in our offices;
- information gleaned from a meeting held by the NRC in Plymouth, Massachusetts on March 8, 2006;
- information related to the National Pollutant Discharge Elimination System (NPDES) permit issued by EPA to Pilgrim Station, and currently under review by EPA for potential reissuance, under Section 402 of the Clean Water Act (this permit regulates the facility's cooling water

*SOWSI Review Complete*

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- withdrawals and pollutant discharges (other than radionuclide discharges regulated by the NRC); and
- EPA's past experience with various aspects of pollution control regulation at nuclear power plants.

Pilgrim Station is located on the northwest corner of Cape Cod Bay in Plymouth, Massachusetts. The station consists of a boiling water nuclear reactor and associated systems, with a total nominal capacity of 670 megawatts. Pilgrim Station is a baseload facility that began commercial operation in December, 1972. The facility's once-through cooling water system withdraws up to 510 million gallons per day of water from Cape Cod Bay for cooling of the condenser. Cooling water passing through the condensers undergoes a temperature rise of about 32°F above ambient water temperature before being discharged back into the bay via a 900-foot long discharge canal.

Pilgrim Station operations have resulted in a range of impacts to marine life in Cape Cod Bay. Because the facility annually entrains large quantities of fish eggs and larvae and impinges large quantities of juvenile and adult fish, we recommend that the EIS pay particular attention to this impact from the plant's cooling system, especially with respect to winter flounder, Atlantic cod, and rainbow smelt. Winter flounder is a species of particular interest due to its commercial, recreational and ecological importance. Estimates of winter flounder age-3 adult equivalent losses due to entrainment and impingement as reported by Pilgrim in annual monitoring reports have ranged from <1 % of the Cape Cod Bay population to almost 30% of the population annually. Entrainment and impingement losses of Atlantic cod and rainbow smelt are of particular concern as well. Atlantic cod have historically supported a large commercial fishery in New England, but their numbers have declined to the point that commercial fishing for this species has almost been completely eliminated in Massachusetts Bay. The EIS should discuss entrainment and impingement losses of Atlantic cod at Pilgrim Station within the context of a collapsed commercial fishery. Pilgrim Station also impinges rainbow smelt, whose numbers have plummeted due to problems such as the loss of spawning habitat. It is our understanding that Rainbow smelt are now being studied for potential listing as a threatened or endangered species under the Endangered Species Act. The entrainment and impingement losses of this species at Pilgrim Station should be assessed within that context.

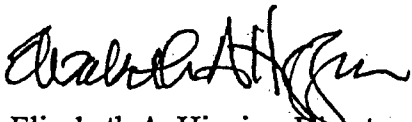
EPA recommends that the EIS use documented impacts to the marine environment from the thirty-four years that Pilgrim Station has been in operation to evaluate the direct, indirect, and cumulative impacts associated with the requested twenty year license extension. In addition, we recommend that the EIS explore alternative modes of operation that would avoid and minimize environmental impacts associated with the current mode of operation. These impacts include effects on water quality and marine life from the facility's pollutant discharges (e.g., any discharges of heat, chemicals, radionuclides, etc.) and withdrawals of water from Cape Cod Bay for cooling. The attachment to this letter provides a summary description of the issues discussed above and others that we believe should be addressed in the EIS, including assessment of the

impacts of cooling water discharges, thermal backwash operations, and the fish return system, and evaluation of alternative mitigation measures and cooling water intake structure technologies.

As we noted during our meetings with NRC staff, EPA is currently reviewing Entergy's application for reissuance of its NPDES permit. While we encourage the NRC to fully analyze the issues described in this letter in its EIS for the twin purposes of satisfying NEPA and supporting appropriate licensing decisions under the Atomic Energy Act and NRC regulations, the EIS should not draw conclusions regarding whether changes to plant operations or existing NPDES permit conditions would be necessary or appropriate to satisfy the Clean Water Act, as responsibility for those determinations rests with the EPA. In addition, the EIS should address relevant issues under other applicable laws, such as compliance with the Endangered Species Act, the essential fish habitat provisions of the Magnuson-Stevens Act, and the Coastal Zone Management Act.

Thank you for the opportunity to comment on the scope of the upcoming EIS for the Pilgrim Nuclear Power Station. We appreciate the NRC's efforts to coordinate with the EPA and other agencies and look forward to continuing to participate in the review of the project through the NEPA/relicensing process. Should you have any questions or wish to discuss our comments, please contact me or Timothy Timmermann of EPA's Office of Environmental Review at 617/918-1025.

Sincerely,



Elizabeth A. Higgins, Director  
Office of Environmental Review

enclosure

cc:

Chris Boelke, NMFS  
Christine Godfrey, USACE  
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Susan Snow Cotter, MACZM

## Detailed Scoping Comments for Pilgrim Station Relicensing EIS

### *Cooling Water Discharge*

Pilgrim Station discharges a maximum of 510 million gallons per day (MGD) of heated non-contact condenser cooling water to Cape Cod Bay. Pilgrim's current National Pollutant Discharge Elimination System (NPDES) permit specifies a maximum daily temperature limit of 102°F. The EIS should assess the scope of the thermal plume across the tidal cycle in terms of area and depth of the water body impacted, the amount of heat added to the water (in British Thermal Units) and the extent to which the discharge alters ambient water temperatures. The EIS should also assess the effects of the thermal plume on the marine environment, including effects on water quality and marine organisms. This analysis should consider possible acute and chronic effects to marine organisms, such as causing mortality, habitat avoidance, interrupted spawning, or increased predation threats, based on an evaluation of the temperatures at which effects on the health and behavior of the relevant organisms may occur. Possible ecological effects should also be considered (e.g., has warm water attracted a non-native species that drive out the native species). Effects on the benthic community, including physical effects from scouring by the discharge, should also be assessed. Adverse benthic effects have been documented in the past, primarily from scouring, over an area of one to two acres. Many of the above issues have been reviewed to at least some extent in the past by EPA and other federal and state agencies in the context of Pilgrim Station's NPDES permit, but an updating of the impact analyses in light of current information would be appropriate in the context of the NRC's EIS.

It should also be noted that two fish kill events resulting from gas bubble disease occurred in the Station's discharge canal during the 1970's. Subsequently, Pilgrim was required to install a barrier net in the discharge canal to prevent fish from entering and residing there. However, in 1996, Pilgrim was allowed to remove the net because no significant fish kill events had occurred for some time. There also have been no documented large fish kill events since the net was removed. Nevertheless, there is a risk that a large year class of menhaden, for example, will detect the thermal plume of Pilgrim Station and possibly take residence in the plume or canal. This would once again subject fish to gas bubble disease. The EIS should consider options for preventing this impact when a strong year class is projected, including the possibility of requiring that Pilgrim Station deploy a barrier net during appropriate periods to reduce impacts and implement a biological surveillance program to effectively determine when impact minimization measures should be triggered.

### *Other Pollutant Discharges*

The EIS should also catalogue all other (i.e., non-thermal) pollutant discharges by Pilgrim Station and assess their environmental effects. These other pollutants may include chlorine or other biocides, copper, radionuclides, metals, or other contaminants. Again, EPA has information on some of these pollutants in its NPDES permit files, but the NRC could update this information as

needed and likely has more information regarding radionuclides or better access to such information than EPA does.

### *Dredging Needs*

In the past, Pilgrim Station has needed to dredge the areas in front of its cooling water intake to prevent siltation from interfering with plant operations. The dredged material must then be disposed of or used in an appropriate way. There have been issues, however, regarding contamination of that dredged material, presumably as a result of the power plant's wastewater discharges. While these issues were resolved for past dredging, it would be appropriate for the EIS to assess whether the facility will have future dredging needs and what environmental issues would be associated with any such dredging. The U.S. Army Corps of Engineers and EPA are both likely to have information on this topic in their files.

### *Thermal Backwash*

Pilgrim Station currently controls macro-fouling by periodically re-routing heated condenser cooling water back through the system and out through each intake embayment separately. This process, called thermal backwashing, is performed about four to five times per year at full thermal load and three to four times per year at 50% thermal load. Backwashing both sides of each condenser can take up to four hours within one day and the temperature may reach as high as 120°F. EPA encourages the NRC to include an evaluation of the impacts of the thermal backwash on aquatic organisms in the EIS.

### *Entrainment*

In the past, Entergy has used the following three methods to evaluate the Station's entrainment impacts to the local winter flounder population: (1) the "equivalent adult" method; (2) estimating the percentage of the total larval population passing by the facility that is entrained; and (3) the RAMAS (Risk Analysis Management Alternative System) winter flounder model. We believe these three methods, and others as appropriate, should be discussed in the EIS based on coordination with the EPA and other interested state and federal agencies. In coordination with EPA and the other interested resource agencies, the EIS should include an analysis of the accuracy and applicability of these methods.

Several other fish species, besides winter flounder, also suffer substantial entrainment losses at the Pilgrim facility. These include cunner, mackerel, menhaden, Atlantic cod and Atlantic herring. The EIS should assess the potential impacts of entrainment on all the native fish species affected, along with means to reduce these impacts, including the use of the alternate cooling water intake system technologies discussed below.

### *Impingement*

EPA is concerned about repeated impingement events at Pilgrim Station. Historic data for Pilgrim shows high impingement numbers for several fish species including Atlantic silversides, Atlantic menhaden, blueback herring, grubby, alewife, Atlantic cod, and rainbow smelt. The majority of rainbow smelt impinged at Pilgrim Station are believed to have originated from the nearby Jones River population. However, without a quantitative evaluation of the size of the Jones River population, it is not possible to fully assess the impact of Pilgrim Station. The EIS should assess the potential impacts of impingement on all native fish species affected, as well as provide a discussion of potential measures that can be taken to reduce these impacts.

### *Fish Return System*

The EIS should assess Pilgrim Station's current fish return system and document any problems with it. We currently recognize at least three shortcomings of the current fish return system that contribute to an increase in impingement mortality at Pilgrim. First, chlorinated service water from the intake is de-chlorinated and used to spray fish and debris from the screens. There have been several documented occasions when the de-chlorination system failed to operate correctly and fish were subjected to a chlorinated salt-water spray. Second, the screens are normally only rotated once every 8-hour shift, thereby increasing the length of time that fish are held against the screens. Third, fish are returned back to the intake embayment of the Station, about 100 yards upstream of the intake structure, which may result in high re-impingement rates.

In response to these three issues, we believe the EIS should discuss the benefits of installing a chlorine measuring and malfunction notification system, evaluate the feasibility of continuous screen rotation and assess re-impingement rates and whether there may be a more appropriate relocation point for the fish return. In addition, the EIS should evaluate other options for improving the fish return system to minimize impingement mortality.

### *Alternate Cooling Water Intake System Technology Evaluations*

The EIS should discuss reasonable alternative ways to reduce impingement, impingement mortality, entrainment and thermal discharges at Pilgrim Station. Specifically, EPA supports a thorough evaluation of (1) alternative protection technologies including substratum intake structure, various screening technologies (including wedgewire screens, fine-mesh barrier nets or screens (e.g., "Gunderbooms")), cooling towers, variable speed pumps, and fish return system upgrades; (2) alternative operational schemes including seasonal flow restrictions, continuous screen operation, scheduling plant outages to minimize environmental impacts and the installation of a chlorine measuring and malfunction notification system; and (3) potential mitigation measures. In assessing these alternatives, the EIS should not only evaluate their environmental ramifications, but should also address the nuclear power plant safety implications of the alternatives.

### *Hatchery*

The applicant supports an on-going winter flounder hatchery study and claims that the hatchery activities for winter flounder are providing stock enhancement that can be relied upon as an effective form of mitigation for entrainment losses of the wild winter flounder population. If this remains a reasonably foreseeable option for Pilgrim Station, the EIS should explore this issue more fully. At present, we are not aware of convincing evidence that the stocked fish survive to reproduce in these habitats. Moreover, there has not been a study of the potential impacts of hatchery-reared fish on the native population. The genetic and behavioral implications should also be studied in order to determine if this hatchery is a true mitigation mechanism for winter flounder or simply another ecological disturbance.

### *Essential Fish Habitat and Endangered Species Act*

To identify species of interest, the EIS should determine the presence of particular species within general proximity of the project location. The EIS should include species for which Essential Fish Habitat under the Magnuson-Stevens Act is listed near the proposed project location. The EIS should cross-reference this list with NOAA's ECOMON and MARMAP datasets with information from stations around the project area. A final list of species of interest should be developed in consultation with EPA, NMFS and MA DMF. The EIS should also assess any potential impacts to endangered species from Pilgrim Station's operations.

### *Energy Assessment*

In addressing the purpose and need for the NRC's proposed re-licensing action, the NRC should assess and discuss the role of Pilgrim Station in meeting New England's energy needs.